Determinants of the Regularity of Cervical Cancer Screening among Women in Semarang, Indonesia

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Abstract: Based on data from the 2021 Indonesian Health Profile, cervical cancer ranks second after breast cancer, accounting for 36,633 cases or 17.2% of all cancers in women. In 2023, the cervical cancer screening coverage in Indonesia is projected to reach only 7.02% of the target of 70%. Method: This research follows an observational analytic design with a cross-sectional approach. The data was obtained from secondary data from the 2023 Indonesian Health Survey. Results: The bivariate analysis using the Chi-square test indicated a statistically significant relationship between employment status, age, economic status, education level, and the regularity of cervical cancer screening (p-value <0.001). Conclusion: It is evident that there is a relationship between employment status, age, economic status, and education level with the regularity of cervical cancer screening. Continuous health promotion activities focusing on cervical cancer screening are essential to enhance the regularity of cervical cancer screening.

Keywords: Determinants; Cervical Cancer; Screening.

INTRODUCTION

The cervix or neck of the uterus is an organ located in the lower third of the uterus, cylindrical in shape, protruding, and connected to the vagina through the external uterine ostium. Cervical cancer is a malignancy originating from the cervix caused by the HPV virus (Human Papilloma Virus) (Ministry of Health of the Republic of Indonesia, 2023). It was recorded that in 2022, more than 660,000 women in the world were diagnosed with new cases of cervical cancer, and deaths caused by cervical cancer were 350,000 women (Saaka & Hambali, 2024). By 2024, approximately 13,820 women in the United States will have been diagnosed with advanced cervical cancer, and it is predicted that by the end of 2024, approximately 4,360 women will have died from cervical cancer (Asare et al., 2024). India is also the third-highest contributor to the number of new cervical cancer cases in the world and the second-highest number of cervical cancer deaths in the world, with a population of 1.4 billion in 2020 (Min Feng Ooi et al., 2024). Meanwhile, according to the 2021 Indonesian Health Profile, cervical cancer is the second most common cancer after breast cancer, accounting for 17.2% (36,633 cases) of total cancer cases and causing 21,003 deaths (9%) of all cancer deaths (Umar et al., 2023). Cervical cancer control has been regulated in the Regulation of the Minister of Health of the Republic of Indonesia Number 34 of 2015 concerning the Control of Breast Cancer and Cervical Cancer in Article 4, which contains the form of cervical cancer services including promotive (carried out by community leaders/groups) and preventive (carrying out mass screening/early follow-up carried out by trained doctors or midwives) (Health, 2015).

According to WHO (World Health Organization), 490,000 women in the world are diagnosed with cervical cancer every year, and 80% are in low-income or developing countries because high-income or developed countries are more familiar with screening or secondary prevention.(Rasyid & Maliani, 2018). Public health strategies in preventing deaths from cervical cancer with primary prevention and secondary prevention. Primary prevention emphasizes health education to reduce risk factors. Secondary prevention is early detection of the disease and appropriate treatment. Secondary prevention requires examinations that can diagnose the cancer at an early stage (Cholifah et al., 2017). Screening is an effort to detect early the type of clinical disorder that cannot be determined using certain tests, examinations, or procedures. This method can be used to select patients in seemingly prime condition who suffer from a clinical disease (Nasution et al., 2019). Since 2004 in Indonesia, a new method for early screening of cervical cancer has been known, namely the IVA method (Visual Inspection with Acetic Acid). IVA examination is an examination of the cervix by applying 3-5% acetic acid to the cervix and observing for 1-2 minutes for the presence of thickened white plaque (acetowhite epithelium). IVA is a test that is visually used to detect pre-malignant lesions in the cervix (Titisari et al., 2017). Other examinations can include a Pap smear (conventional or liquid-base cytology / LBC), VILI (Visual Lugoliodin Inspection), or HPV DNA (genotyping/hybrid capture). In 2023, the coverage of cervical cancer screening in Indonesia was recorded to have only reached 7.02% of the target of 70%. This study was conducted to determine the determinants of women's regularity in preventing or early detection of cervical cancer.

METHOD

This study uses a quantitative research type with an analytical observational design and a cross-sectional approach. The data was obtained from secondary data from the 2023 Indonesian Health Survey related to cervical cancer. The data that has been received will be analyzed using the chi-square test.

RESULTS AND DISCUSSION

Table 1. Univariate Analysis of Utilization of Cervical Cancer Screening Services (Pap smear/IVA)

Variables	Number (n)	Percentage (%)
Cervical Cancer Screening		
Regular	9,756	38.9
Irregular	15,337	61.1
Work		
Work	11,893	47.4
Doesn't work	13,200	52.6
Age		
Early adulthood	11,066	44.1
Middle adulthood	11,397	45.4

Variables	Number (n)	Percentage (%)
Late adulthood	2,630	10.5
Economic Status		
Lower Middle Class	6.618	26.4
Intermediate	4.224	16.8
Upper Middle	14,246	56.8
Education		
Low Education	13,906	55.4
higher education	11,187	44.6

Table 1 is the univariate analysis of the utilization of cervical cancer screening services (Papsmear/IVA) in Semarang City. This table presents univariate analysis data on the utilization of cervical cancer screening services (Pap smear/IVA) based on several variables: screening regularity, occupation, age, economic status, and education.

From the table, it can be seen that the majority of respondents (61.1%) did cervical cancer screening irregularly, while only 38.9% did it regularly. This shows that many women have not been entirely routine in doing screening examinations, even though it is essential for the early detection of cervical cancer. Factors such as awareness, access to health facilities, and time availability may play a role in this low regularity of screening.

The employment variable shows that more unemployed women (52.6%) utilized cervical cancer screening services than employed women (47.4%). This difference may be related to time and accessibility. Unemployed women may have more time to access health services, while employed women may face time or workload challenges that limit access to screening services. However, the relatively high numbers for both groups indicate that both groups are well-represented in utilizing screening services.

In terms of age, the middle-aged adult group had the highest percentage of screening utilization at 45.4%, followed by the early-adult group at 44.1%. The late-adult group had the lowest utilization rate at 10.5%. This may be because middle-aged women are more aware of the importance of reproductive health and have a higher risk of developing cervical cancer. In contrast, late-adult women may feel less at risk or are no longer too concerned about their reproductive health.

Economic status also affects the utilization of screening services. Women from the middle to upper economic groups dominate the utilization of screening services with a percentage of 56.8%. This shows that women with higher economic status are better able to access health services in terms of finances and awareness of the importance of early detection. Meanwhile, women from the middle to lower economic groups have lower utilization rates, 26.4% and 16.8% respectively. This reflects the existence of financial barriers in accessing health services for disadvantaged groups.

Education plays a vital role in the utilization of cervical cancer screening services. Women with low education had a higher screening utilization rate (55.4%) than women with high education (44.6%). This may be contrary to many studies, but it could be that women with low education are more involved in mass screening programs facilitated by the government or health institutions. In contrast, women with high education may feel healthier or be less motivated to undergo routine screening.

Table 2. Bivariate Analysis of Utilization of Cervical Cancer Screening Services (Pap smear/IVA)

Variables	Utilization of Cervical Cancer Screening Services				p-value	OR	(95% CI)
	Regular		Irregular				
	n	%	n	%			
Work							
Work	4.773	48.9	7.120	46.4	<0.001**	1,105	1,051 – 1,163
Doesn't work	4.983	51.1	8.217	53.6			
Age							
Early adulthood	4.079	41.8	6,987	45.6	<0.001**	1,789	1,641 – 1,952
Middle adulthood	4.312	44.2	7,085	46.2	<0.001**	1,655	1,517 – 1,804
Late adulthood	1,369	14	1.265	8.2			
Economic Status							
Lower Middle Class	3.290	33.7	3.328	21.7	<0.001**	0.495	0.466 – 0.525
Intermediate	1,842	18.9	2.382	15.5	<0.001**	0.618	0.576 – 0.663
Upper Middle	4.619	47.4	9,627	62.8			
Education							
High	4,557	46.7	9,349	61	<0.001**	0.561	0.533 – 0.591
Low	5.199	53.3	5.988	39			

** = p-value < 0.001

Table 2 presented the result of bivariate analysis related to the utilization of cervical cancer screening services (Papsmear/IVA) based on several variables: occupation, age, economic status, and education. This bivariate analysis shows the relationship between independent variables and the dependent variable, namely the utilization of cervical cancer screening regularly or irregularly.

From the analysis results, it can be seen that among respondents who work, 48.9% use cervical cancer screening services regularly, while 46.4% do not regularly. Meanwhile, for those who do not work, only 51.1% use screening regularly, and 53.6% do not regularly. The p-value obtained is <0.001, which

means a statistically significant relationship exists between employment status and the use of cervical cancer screening. This means that work influences women's decisions to undergo regular screening or not. From the Odds Ratio (OR) value of 1.105 (95% CI: 1.051-1.163), it can be concluded that those who work are 1.105 times more likely to undergo regular screening than those who do not. These results are in line with research conducted in the Philippines in 2022, which explained that women who are currently working are 1.3 times more likely to undergo screening than those who do not work.(Myint et al., 2024). Research in the United States also suggests that lower income levels are significantly associated with lower screening rates and a higher burden of cervical cancer.(Castellano et al., 2024).

The age variable divided respondents into three categories: early adulthood, middle adulthood, and late adulthood. In the early adulthood category (21-35 years), 41.8% were screened regularly and 45.6% were irregular. For the middle adulthood category (36-50 years), 42.4% of respondents were routinely screened and 45.6% were irregular. Meanwhile, in the late adulthood group (51-65 years), only 12.6% were screened periodically and 8.2% were irregular. The p-value of these three age groups also showed significant results with $p < 0.001$. This indicates that age also has a substantial relationship with the use of cervical cancer screening. In early adulthood, the OR of 1.789 (95% CI: 1.641-1.952) shows that respondents in this age group are almost 1.8 times more likely to be screened regularly than other groups. For the middle adult group, the OR was 1.655 (95% CI: 1.517-1.804), indicating a greater likelihood than the late adult category to undergo regular screening. However, this is not in line with the Scoping Review study conducted in 2023, which stated that As one gets older, one's comprehension and thought patterns will increase, so one's knowledge will improve.(Maryati, 2023). On the other hand, research in Ethiopia says that having sex for the first time at the age of under 15 years increases the possibility of developing cervical cancer four times, so there is a need to improve health promotion about the importance of screening.(Teklehaimanot et al., 2024).

Then, in the economic status variable, respondents were divided into three categories: lower middle, middle, and upper middle. Respondents with lower middle economic status who screened regularly were 33.7%, while those who were irregular were 21.7%. In the middle economic group, only 18.9% routinely screened and 15.5% were irregular. For upper middle economic status, 47.4% screened regularly, and 62.8% were irregular. The p-value of <0.001 indicates that economic status significantly affects the utilization of cervical cancer screening. The OR for the lower middle group was 0.495 (95% CI: 0.466-0.525), which means that this group is less likely to screen regularly than other groups. The OR for the middle economic group was 0.618 (95% CI: 0.576-0.663), which also showed a lower likelihood than the upper middle group. This is in line with research conducted in Denmark in 2024 that low-income women showed the highest likelihood of not participating in cervical cancer screening (Helgestad et al., 2024).

Respondents with high education who regularly screened reached 47.7%, while 61.4% did irregular screening. On the other hand, respondents with low education who regularly screened were 53.3%, and those who were irregular were 39%. The p-value for the education variable was also significant with <0.001, indicating that education level has a substantial relationship with the utilization of cervical cancer screening services. The OR of 0.561 (95% CI: 0.533-0.591) indicates that those with low education are less likely to screen regularly than those with high education. In line with research conducted in 2022 in Bogor Regency that high levels of education affect their knowledge of cervical cancer prevention and the importance of regular screening so that preventive behavior can be implemented optimally (Artiansah & Novita, 2022). The level of knowledge regarding cervical cancer screening is also low in Ethiopia, as the category of no education reaches 57.8% (Guye et al., 2024). Based on research conducted through a scoping review also states that there are obstacles in early screening of cervical cancer using the IVA test method, Pap Smear, and early prevention of cervical cancer with HPV vaccination, one of which is caused by a lack of knowledge (Khairunnisa et al., 2022).

From the table above, it is clear that there is a significant relationship between occupation, age, economic status, and education in the utilization of regular cervical cancer screening services. These variables provide a deeper picture of the factors that influence women's decisions to undergo cervical cancer screening. Factors such as occupation, education, and economic status tend to be the main determinants, as those who are employed, highly educated, and from higher economic status have better access and higher awareness of the importance of cervical cancer screening.

On the other hand, although it initially appears that the older a person is, the less likely they are to be screened, these results show that early and middle adulthood are more active in being screened than late adulthood. This may be related to more significant health awareness in the productive ages and support from public health programs that are more focused on this age group.

To manage cervical cancer screening as widely as possible, achieve effective interventions, and achieve optimal coverage levels, it is necessary to consider social determinants, collaborate with other cancer screening programs, and strive to gain community trust (Corrales et al., 2024).

CONCLUSION

There is a relationship between employment status, age, economic status, and education level with the regularity of cervical cancer screening. Continuous health promotion activities that focus on cervical cancer screening are essential to increase the regularity of cervical cancer screening.

REFERENCES

Artiansah, D., & Novita, A. (2022). Determinants of Cervical Cancer Prevention Behavior in Prostitutes in Bogor Regency. Indonesian Midwifery Scientific Journal, 12(04), 122–129. https://doi.org/10.33221/jiki.v12i04.1461

Asare, M., Owusu-Sekyere, E., Elizondo, A., & Benavidez, G. A. (2024). Exploring Cervical Cancer Screening Uptake among Women in the United States: Impact of Social Determinants of Health and Psychosocial Determinants. Behavioral Sciences, 14(9). https://doi.org/10.3390/bs14090811

Castellano, T., ElHabr, A.K., Washington, C., Ting, J., Zhang, Y.J., Musa, F., Berksoy, E., Moore, K., Randall, L., Chhatwal, J., Ayer, T., & Leath, C. A. (2024). Health disparities in cervical cancer: Estimating geographic variations of disease burden and association with key socioeconomic and demographic factors in the US. PLOS ONE, 19(7 July), 1–14. https://doi.org/10.1371/journal.pone.0307282

Cholifah, N., Rusnoto, & Hidayah, N. (2017). Factors Affecting Early Detection of Cervical Cancer. University Research Colloquium, 457–470. http://journal.ummgl.ac.id/index.php/urecol/article/download/1463/940/

Corrales, ACY, Urrutia, M. T., & Padilla, O. (2024). Explanatory Model of Self-Efficacy for Cervical Cancer Screening. Clinical and Experimental Obstetrics and Gynecology, 51(4), 1–9. https://doi.org/10.31083/j.ceog5104084

Guye, A.H., Shambi, D.B., Nigussie, T., & Wayesa, T.D. (2024). Knowledge of cervical cancer screening and its determinants among 30–49-year-old rural reproductive age women in Sadi Chanka district, West Oromia, Ethiopia, 2022: A mixed method study. SAGE Open Medicine, 12. https://doi.org/10.1177/20503121241241218

Helgestad, A.D.L., Andersen, B., Njor, S.H., & Larsen, M.B. (2024). The association of demographic and socioeconomic variables with cancer screening participation: A national cross-sectional study of three cancer screening programs in Denmark. Heliyon, 10(13), e31163. https://doi.org/10.1016/j.heliyon.2024.e31163

Ministry of Health of the Republic of Indonesia. (2023). Cervical Cancer Management Guidelines (Vol. 2, Issue 1).

Health, M. (2015). REGULATION OF THE MINISTER OF HEALTH OF THE REPUBLIC OF INDONESIA NUMBER 34 YEAR 2015 CONCERNING THE MANAGEMENT OF BREAST CANCER AND CERVICAL CANCER.

Khairunnisa, P., Ronoatmodjo, S., & Prasetyo, S. (2022). Factors Influencing Women to Undergo Early Cervical Cancer Screening: A Scoping Review. Indonesian Journal of Health Epidemiology, 6(2), 75–80. https://doi.org/10.7454/epidkes.v6i2.6256

Maryati, I. (2023). Factors Affecting Cervical Cancer Screening in Indonesia: Scoping Review. Journal of the Indonesian National Nurses Association (JPPNI), 8(1), 12. https://doi.org/10.32419/jppni.v8i1.404

Min Feng Ooi, B., Muschialli, L., Kondal, D., Andia, G., Ng Ho Tsun, I., Huang, HYR, Singh, K., Aggarwal, A., Ali, MK, Tandon, N ., Narayan, K.V., Mohan, V., Dhillon, P.K., Gillespie, T.W., Prabhakaran, D., Goodman, M., & Shridhar, K. (2024). Individual-level determinants of breast and cervical cancer screening and early testing in two regionally representative urban Indian populations. Preventive Medicine Reports, 46, 102883. https://doi.org/10.1016/j.pmedr.2024.102883

Myint, W.W., Aggad, R., Fan, Q., & Mendez, S.E. (2024). Factors Influencing Cervical Cancer Screening Uptake among Reproductive-Aged Filipino Women: Findings from the 2022 Philippines National Demographic and Health Survey. Women's Health Reports, 5(1), 485–494. https://doi.org/10.1089/whr.2024.0011

Nasution, MZ, Nababan, AA, Syaliman, KU, Novelan, MS, & Jannah, M. (2019). Application of Principal Component Analysis (PCA) in Determining Dominant Factors Affecting Cervical Cancer Sufferers (Case Study: Cervical Cancer Dataset). Jurnal Mantik Penusa, 3(1), 204–210.

Rasyid, MZ, & Maliani. (2018). CANCER CONTROL POLICY THROUGH IMPLEMENTATION OF IVA TEST (VISUAL INSPECTION OF ACETIC ACID) IN EFFORTS TO DETECTION EARLY CERVICAL CANCER IN BANJARBARU. Journal of Development Policy, 13(2), 123–128.

Saaka, S.A., & Hambali, M. (2024). Factors associated with cervical cancer screening among women of reproductive age in Ghana. BMC Women's Health.

Teklehaimanot, DA, Mekuria, AD, Dadi, AF, & Derseh, BT (2024). Precancerous lesion determinants in women attending cervical cancer screening at public health facilities in North Shoa Zone, Amhara, Ethiopia: an unmatched case-control study. BMC Women's Health, 24(1), 1–9. https://doi.org/10.1186/s12905-024-03113-z

Titisari, I., Yanuarini, R., & Dwi Antono, S. (2017). FACTORS INFLUENCING THE ATTITUDE OF FERTILE AGE COUPLES (PUS) TOWARDS CERVICAL CANCER SCREENING USING IVA METHOD IN THE WORKING AREA OF THE NORTH AREA CITY HEALTH CENTER OF KEDIRI CITY. Journal of Health Sciences, 5(2), 1–8.

Umar, F., Fatmasari, EY, & Wigati, PA (2023). Effectiveness of Implementation of Early Detection Policy for Cervical and Breast Cancer at the Kebayoran Lama District Health Center. Indonesian Public Health Media, 22(4), 228–237. https://doi.org/10.14710/mkmi.22.4.228-237