



The relationship between knowledge and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia

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ABSTRACT

Cervical cancer is one of the cancers with high incidence and mortality rates in Indonesia. Early detection is a crucial strategy to reduce cervical cancer-related mortality. Adequate knowledge regarding cervical cancer and its early detection plays an important role in shaping positive attitudes toward undergoing screening. However, awareness and participation in early detection among late adolescents, particularly female university students, remain low. This study aimed to analyze the relationship between knowledge and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia. A quantitative study with a cross-sectional design was conducted in November 2024. The study involved 100 female students aged 18–24 years from Universitas Pendidikan Indonesia. Data were analyzed using the chi-square test. The results showed that 50% of respondents had good knowledge and 50% had poor knowledge regarding cervical cancer detection, while 79% demonstrated a positive attitude and 21% demonstrated a negative attitude toward early detection. No significant relationship was found between knowledge and attitudes toward early detection of cervical cancer ($p = 0.624$; $p > 0.05$). It can be concluded that knowledge was not associated with attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia.

Introduction

Cervical cancer is a form of malignancy in the cervical area caused by the abnormal growth of cervical epithelial tissue due to persistent infection by oncogenic high-risk Human Papilloma Virus (HRHPV) (Kurniasih & Hartato, 2023). Based on data from Globocan, a

program managed by the International Agency for Research on Cancer (IARC), in (2022) cervical cancer ranked second in cancer incidence among women with 36,964 new cases and third as a cause of cancer-related deaths with 20,708 deaths in Indonesia.

Cervical cancer develops gradually and takes approximately 5–10 years from initial exposure to progression into invasive cancer (Kong et al., 2025). This relatively long development process from initial cell infection to cervical cancer provides an opportunity for women of reproductive age (WUS), particularly those in the late adolescent age group, to perform early cervical cancer detection (Yang et al., 2022). Therefore, efforts to prevent cervical cancer are crucial for women to reduce the incidence of cervical cancer, such as adopting a healthy lifestyle, avoiding risk factors that contribute to cervical cancer incidence, receiving HPV vaccination as a specific protection measure, and performing early cervical cancer detection (Rodríguez et al., 2024).

Prevention and early detection are crucial in the comprehensive management of cervical cancer given the impact of cervical cancer on patients, families, and the government (Kementerian Kesehatan Republik Indonesia, 2024). Prevention of cervical cancer can begin as early as adolescence (Bhalerao et al., 2024). Women in the late adolescent age group begin to show attention to reproductive health. This occurs because at this stage, adolescent females begin to consider preparation for the reproductive process, making the health of reproductive organs an important aspect to consider (Leekuan et al., 2022).

In this regard, the late adolescent group generally consists of individuals at the university education level with certain academic backgrounds that can influence their understanding of the importance of reproductive health (Ambarwulan et al., 2024). However, previous research has revealed that adolescent knowledge about cervical cancer prevention remains relatively low (Jodjana et al., 2023).

Findings across studies remain inconsistent regarding the relationship

between knowledge and attitudes toward cervical cancer screening among university students. Easwaran et al. (2023) report that higher education is associated with better knowledge and more positive attitudes, while others found that knowledge scores did not reflect attitudes and preventive practices, suggesting that knowledge alone does not automatically translate into positive health-seeking behavior (Winarto et al., 2022).

This inconsistency highlights the need to examine this relationship in specific university populations with diverse academic backgrounds. To date, no study has specifically investigated the relationship between knowledge and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia (UPI), making this study a necessary contribution and basis for developing targeted health education interventions at the university level.

Understanding this relationship requires a clear conceptual foundation regarding what constitutes knowledge and attitudes in the context of cervical cancer prevention. Knowledge is produced through sensory processes involving the eyes and ears in observing certain objects (Marzvanyan & Alhawaj, 2023). Several factors, such as education level, age, occupation, and access to information, influence a person's knowledge. Women's knowledge about cervical cancer affects their decision to undergo early detection. Low levels of knowledge among adolescent females reduce their participation in screening, because knowledge serves as a predisposing factor that facilitates attitudinal change (Obannaya et al., 2026).

Attitude is an individual's response to a stimulus or object that involves personal opinion and emotion. With a positive

attitude, individuals are expected to be able to accept, respond to, and take responsibility for their own health, thereby increasing awareness to perform early cervical cancer detection (Aynalem et al., 2025). Based on this assumption, greater knowledge is expected to contribute to the development of a more positive attitude toward early cervical cancer detection.

Method

The study was conducted within the academic environment of Universitas Pendidikan Indonesia, centered in the city of Bandung, in November 2024. The population in this study consisted of all active female students at Universitas Pendidikan Indonesia. Considering the feasibility of data collection within the study period and the availability of eligible participants, a sample size of 100 respondents was determined. A sample of 100 individuals was selected using accidental sampling. This technique was chosen because it enabled efficient recruitment of respondents who met the inclusion criteria and were readily available during the data collection period.

Although accidental sampling facilitated timely data collection, it is a non-probability sampling method that may limit the representativeness of the sample and the generalizability of the findings. Inclusion criteria for the sample were: (a) willingness to participate in the study and (b) active female student at Universitas Pendidikan Indonesia. Exclusion criteria included: (a) unwillingness to participate or inability to complete the questionnaire and (b) female students who were on academic leave.

This study used a quantitative approach with a cross-sectional study design. The objective of this study was to determine the extent to which the level of knowledge (influencing factor)

contributes to behavior (influenced factor) regarding early cervical cancer detection among the female student population at Universitas Pendidikan Indonesia.

Primary data were obtained through the distribution of an online questionnaire to female students at Universitas Pendidikan Indonesia. The questionnaire was adapted from Mainarni, (2016) entitled Knowledge and Attitudes of Women of Reproductive Age Toward Early Detection of Cervical Cancer in the Working Area of Pustu Kelurahan Timbangan, Padangsidempuan City. The instrument consisted of 20 knowledge items and 10 attitude items. Knowledge was categorized as good or poor, while attitudes were classified as positive or negative using cut-off values modified based on the mean scores obtained in the present study.

This study employed bivariate analysis to examine the relationship between knowledge and attitudes related to early cervical cancer detection among female students at Universitas Pendidikan Indonesia, using the chi-square statistical test. Prior to analysis, the assumptions underlying the chi-square test were verified, confirming that no cells had an expected count of less than one and that no more than 20% of cells had expected counts less than five, indicating that the data met the requirements for valid application of the chi-square test (Field, 2024). Research results were considered to have a significant relationship if the significance value (sig.) ≤ 0.05 (Paratiwi, 2021).

Result and Discussion

Respondent Characteristics

A total of 100 respondents participated in this study. The distribution of respondents based on age and study program is shown in Table 1.

Table 1. Frequency Distribution of Respondent Characteristics

Characteristic	f	%
Age		
18–19 years	33	33
20–24 years	67	67
Study Program		
Non-Health	59	59
Health	41	41

Source: Primary Data, 2024

Table 1 shows that the majority of respondents were in the age range of 20–24 years, totaling 67 individuals or 67% of the total respondents. Table 1 also shows that respondents from non-health study programs dominated with 59 individuals or 59% of the total respondents.

Knowledge and Attitudes Toward Early Detection of Cervical Cancer

The distribution of respondents based on their knowledge and attitudes toward early detection of cervical cancer is presented in Table 2.

Table 2. Frequency Distribution of Knowledge Categories and Attitudes Toward Early Detection of Cervical Cancer

Characteristic	f	%
Knowledge Score		
Good	50	50
Poor	50	50
Attitude Score		
Positive	79	79
Negative	21	21

Source: Primary Data, 2024

Table 2 shows that respondents are equally divided in their knowledge levels. In contrast, the majority of respondents (79%) demonstrate a positive attitude toward the early detection of cervical cancer. While these findings highlight a clear gap between split knowledge levels and highly positive attitudes, it raises the critical question of whether a direct statistical link exists between the two variables.

Relationship Between Knowledge Level on Cervical Cancer and Attitudes Toward Early Detection

To examine the association between knowledge level and attitudes toward early detection of cervical cancer, a cross-tabulation analysis was performed. The results are shown in Table 3.

Table 3. Cross-tabulation of The Relationship Between Knowledge Level and Attitudes Toward Early Detection of Cervical Cancer

Variable	Attitude Score: Positive	Attitude Score: Negative	Sig.
Knowledge Score			
Good	41 (82%)	9 (18%)	0,62
Poor	38 (76%)	12 (24%)	4

Source: Primary Data, 2024

Table 3 shows that respondents with good knowledge scores and positive attitude scores were dominant, totaling 41 individuals or 82%, while respondents with poor knowledge scores and positive attitude scores totaled 38 individuals (76%). The chi-square analysis yielded a significance value of 0.624 ($p > 0.05$), indicating no significant relationship between knowledge and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia. The Prevalence Ratio (PR) was

1.079 (95% CI: 0.881–1.322), indicating that respondents with good knowledge were only 7.9% more likely to have a positive attitude toward early detection compared to those with poor knowledge. As the 95% confidence interval crosses 1, this association was not statistically significant, confirming that knowledge level alone does not meaningfully predict attitudes toward early cervical cancer detection in this population.

Discussion

Knowledge about early detection of cervical cancer is very important for female university students, as they are within the reproductive age range (15–49 years). The study found no significant relationship between knowledge and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia, indicating that knowledge alone is not sufficient to influence female students' attitudes toward early cervical cancer detection. Several confounding variables may explain this finding, including cultural norms and stigma surrounding reproductive health examinations (Gutusa & Roets, 2023), limited access to screening facilities (Petersen et al., 2022), media exposure through digital platforms (Li, 2024), personal experience with cervical cancer through family or peers, and HPV vaccination history, whereby vaccinated individuals may perceive themselves as already protected and therefore less inclined to pursue screening (Zhou et al., 2025).

The knowledge categories of respondents were evenly divided between good and poor, with neither category dominating. This indicates that female students do not yet have evenly distributed knowledge regarding cervical cancer detection. Osowiecka et al. (2021) suggest that one of the factors influencing knowledge about cervical cancer early

detection is the field of education pursued. Since the respondents are undergraduate students, their higher education level does not significantly affect their level of knowledge regarding early cervical cancer detection. This aligns with research by Aziz et al. (2024), which revealed that out of 594 female university students surveyed, a staggering 88.7% had unsatisfactory knowledge about cervical cancer demonstrating that higher education enrollment does not inherently guarantee health literacy.

Knowledge about cervical cancer and its early detection is not included in the mandatory curriculum at the university level, especially in non-health study programs. In this study, respondents from non-health study programs outnumbered those from health study programs. Female students from non-health majors have more limited access to health-related information, such as early detection of cervical cancer. This finding aligns with the research of Osowiecka et al. (2021), which states that the average level of knowledge about cervical cancer among health students is better than that of non-health students. Female students pursuing undergraduate education tend to prioritize academic studies, resulting in a lack of awareness about the importance of the cervical cancer issue, especially if it is not relevant to their personal circumstances.

Respondents were in the age range of 18–22 years, which falls under the reproductive age or fertile women category. However, this age group is not considered to be at high risk for cervical cancer. This is supported by Bønløkke et al. (2024), who explains that women aged ≥ 35 years have a higher risk of developing cervical cancer than women under 35 years of age. The younger a woman's age at first sexual intercourse, the greater the risk of developing cervical cancer, because at a young age the cervical epithelial cells

are not yet ready to receive spermatozoan stimulation. This is related to the maturation of cervical mucosal cells, which generally occurs after the age of 20 (Zainunhisham, 2026). The low-risk age profile of the respondents may have contributed to a lower awareness of cervical cancer risk, which in turn influenced their attitudes toward early detection.

Previous research has shown that socio economics status plays an important role in shaping attitudes towards cervical cancer screening. Liu et al. (2022) found that higher socioeconomic status was associated with better access to cervical cancer screening, while Djordjevic et al. (2024) reported that women with low socioeconomic status tended to be less willing to undergo screening due to financial constraints. Although these findings highlight the importance of economic factors, this variable was not examined in the present study. This study specifically focused on the relationship between knowledge and attitudes toward early detection of cervical cancer. The majority of respondents demonstrated good knowledge and positive attitudes. However, statistical analysis revealed that the relationship between knowledge and attitudes was not significant.

Thus, good level of knowledge is not the primary factor determining female students' positive attitudes toward early detection of cervical cancer. Other factors may play a more significant role in shaping these attitudes, including perceptions of vulnerability to cervical cancer, perceptions of barriers such as fear and embarrassment, motivation, and support from family. These factors were not examined in depth study. Nevertheless, the positive attitudes observed among the respondents indicates an opportunity to raise awareness, although such efforts may still be hampered by a limited, in-depth understanding of the importance of

early detection of cervical cancer. Therefore, increasing knowledge about cervical cancer screening among female students remains necessary, as better knowledge has been shown to increase early detection rates and reduce mortality from cervical cancer.

This study only examined the relationship between knowledge and attitudes toward early cervical cancer detection, without investigating the underlying causal factors. Discussion of the factors influencing the level of knowledge and attitudes regarding early cervical cancer detection can be used as a topic for further research by other researchers.

Conclusion

The study results show no significant relationship between knowledge level and attitudes toward early detection of cervical cancer among female students at Universitas Pendidikan Indonesia. This indicates that improving knowledge alone is insufficient to change students' attitudes. To address this, universities need to take concrete action. First, reproductive health education should be integrated into the college curriculum. Second, campuses should conduct hands-on outreach regarding early detection. Finally, access to information about HPV vaccination must be improved to help students turn awareness into real health action.

Authors are encouraged to explore other variables that may influence attitudes toward early cervical cancer detection. Future research should focus on psychological and social factors, such as risk perception, family support, self-efficacy, and social norms, which often play a critical role in shaping health decisions. Additionally, investigating structural and behavioral factors, including access to screening services and

HPV vaccination history, would provide a more comprehensive understanding of student behavior. Alongside these research paths, conducting direct educational activities remains essential to actively improve early detection knowledge.

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