

THE CORRELATION BETWEEN KNOWLEDGE AND AWARENESS OF HUMAN PAPILLOMAVIRUS VACCINE AMONG ADOLESCENT GIRLS IN JUNIOR HIGH SCHOOL

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ABSTRACT

The Human Papillomavirus (HPV) significantly increases cervical cancer. The HPV vaccine can be administered as a primary preventive to stop cervical cancer. Cervical cancer can be prevented most effectively with vaccination. Factors related to knowledge and awareness of the disease influence the decision to get the HPV vaccine. This study aims to ascertain how adolescent girls' knowledge and awareness of the HPV vaccine relate to one another. In this study, a cross-sectional approach was utilized. 128 respondents were selected using cluster random sampling. This study employed the Knowledge regarding HPV, Cervical Cancer, and HPV Vaccine Questionnaire and Awareness about Cervical Cancer, HPV, and HPV Vaccine Questionnaire, all of which were declared valid and reliable. The Spearman Rank test was performed to analyze the data. According to the results, there was a relationship between knowledge and awareness of the HPV vaccine in adolescent girls ($r = 0.554$; $p\text{-value} = 0.000$). Therefore, teenage girls' knowledge and awareness of the HPV vaccine were related. It is suggested that health professionals, particularly those working with young girls, should provide easy-to-understand information about the HPV vaccine and cervical cancer.

Keywords: Awareness, Adolescents, Human Papillomavirus, Vaccine

INTRODUCTION

Undoubtedly, Human Papillomavirus (HPV) is a substantial determinant of cervical cancer. It is crucial to acknowledge that although HPV is a primary contributor, it is not the exclusive determinant, and not all women infected with HPV will develop cervical cancer. Cervical cancer development is impacted by multiple variables, including additional risk factors such as smoking and HIV infection. These supplementary risk factors can increase the probability that women infected with HPV may develop cervical cancer. Hence, a comprehensive comprehension is vital for promoting public health awareness and

making informed healthcare choices, underscoring the need of tackling many risk factors to achieve successful prevention and management of cervical cancer. (American Cancer Society, 2020).

According to data from the Global Cancer Observatory in 2020, the incidence of new cases of cervical cancer in women around the world was around 604,127 patients (3.1%), with a mortality rate of around 341,831 (3.3%) (The Global Cancer Observatory, 2021a). Cervical cancer remains the second most prevalent cancer in Indonesia, following breast cancer. The prevalence of newly diagnosed cases of cervical cancer among women in Indonesia

stands at approximately 36,633 instances, accounting for 9.2% of the population. The mortality rate associated with this condition is 21,003, representing 9% of the affected individuals. (The Global Cancer Observatory, 2021b). According to the facts, many women worldwide, including those in Indonesia, continue to suffer from cervical cancer.

Vaccinations are the most efficacious method for averting cervical cancer and other sexually transmitted malignancies. It is crucial for individuals to receive immunization at a young age before engaging in sexual activity (Ersado, 2021). The World Health Organisation (WHO) advises that the primary demographic for HPV vaccination, as recommended in most countries, is adolescent girls between the ages of 9 and 14. (World Health Organization, 2023). The benefits of vaccines will be particularly significant in developing countries with inadequate access to women's health services (Cohen, Jhingran, Oaknin, & Denny, 2019). The high risk of HPV infection can be considerably decreased by having high and sustained vaccination rates.

Senior high school girls possess a greater depth of knowledge compared to their junior

high school counterparts. Based on a prior study carried out in India, it was shown that older college students had a higher level of awareness regarding HPV and cervical cancer compared to their younger counterparts. The age factor often contributes to the refusal or postponement of HPV vaccination, with older females exhibiting higher vaccination rates compared to younger girls (Rancic et al., 2022).

WHO has created a global strategy to overcome cervical cancer with a 90-70-90 target that must be met by 2030. First, 90% of girls receive the HPV vaccine before reaching the age of 15 years. Second, 70% of women take part in screening examinations at the ages of 35 years and 45 years. Third, women who have cervical cancer receive treatment, namely 90% of women with precancerous conditions receive treatment, and 90% of women with invasive cancer receive treatment (WHO, 2020).

The vaccine coverage for the first dose of the HPV vaccination program for women in Indonesia in 2022 was documented at 6%. (WHO, 2021). The World Health Organization (WHO) has reported that the vaccination coverage for adolescent females aged 15 years in Indonesia, specifically for

the first dose of HPV vaccine in 2021, stands at a mere 5%. (WHO, 2021). These findings have not yet reached the target established by the World Health Organization (WHO), which aims to have 90% of girls vaccinated with the HPV vaccine before the age of 15 years. (WHO, 2020).

The Ministry of Health initiated a cost-free Human Papillomavirus (HPV) immunization program for school-aged children, commencing in 2021. During the initial phase of the free immunization program, numerous misconceptions around the HPV vaccine surfaced and gained traction on social media. These included unfounded claims about its potential to cause infertility and doubts about its efficacy for teenagers (Frianto, Setiawan, Diantini, & Suwantika, 2022; Sitaresmi, Rozanti, Simangunsong, & Wahab, 2020). This matter can impact the level of knowledge and awareness among young women on the prevention of cervical cancer through the utilisation of the HPV vaccine. Research on knowledge and awareness among school children remains scarce, particularly following the implementation of the free immunisation programme. In respect to this occurrence, researchers aim to examine the potential correlation between knowledge

and awareness of the HPV vaccine among adolescent girls in a school setting.

A study stated that women with higher knowledge about HPV and its vaccines influenced their intention to receive the vaccine (Chanprasertpinyo & Rerkswattavorn, 2020). Conversely, poor levels of knowledge of HPV infection and vaccines will result in lower rates of immunization and cervical cancer screening. As a result, the incidence of cervical cancer will increase.

The results of a study stated that despite the high level of awareness of cervical cancer, only a few people were aware of HPV (Yacouti et al., 2022). The desire to receive the HPV vaccine in the future was associated with factors such as knowledge about cervical cancer and the HPV vaccine, willingness to undergo Pap Smear tests in the future, and the perception that cervical cancer is a potentially fatal disease. The objective of this study was to establish the correlation between the level of knowledge and awareness regarding the HPV vaccine in adolescent girls.

METHODS

This study was quantitative research with a cross-sectional design, which was carried out from February to June 2023. The population in this study were adolescent girls who attended Angkasa Jakarta Junior High School with 127 students and Budhi Warman Junior High School with 60 students. The total number of students from the two schools was 187 students.

The sampling technique used in this research was cluster random sampling. Inclusion criteria were adolescent girls who attended Angkasa Jakarta Junior High School and Budhi Warman Junior High School, and never get HPV Vaccine yet. According to the findings of sample calculations utilizing the Slovin formula, the number of respondents obtained was 128. The cluster random sampling method yielded a total of 87 students from Angkasa Jakarta Junior High School and 42 students from Budhi Warman Junior High School. Individuals who had already had HPV vaccination were not included in this study.

The data collection technique was carried out using primary data and secondary data. The primary data was obtained from the results of filling out the questionnaire. Meanwhile, the secondary data was obtained through the school archives. The instruments

used in this study were demographic data questionnaires, knowledge questionnaires, and awareness questionnaires.

The demographic questionnaire collected data on the respondents' characteristics, including age, parents' education, parents' occupation, and parents' income. The survey employed in this study to assess the level of information pertaining to the HPV vaccine was the information regarding HPV, Cervical Cancer, and the HPV vaccine Questionnaire (Winarto et al., 2022). The original version of this questionnaire was written in Bahasa Indonesia. The questionnaire comprises 21 questions, which are categorized into two sections. The initial segment comprises inquiries pertaining to knowledge regarding HPV infection and cervical cancer. Furthermore, the second segment encompasses inquiries pertaining to the HPV vaccine. Each accurate response was assigned a score of 2, whilst an inaccurate response or lack of knowledge resulted in a score of 0. Out of all the items in the questionnaire, only item number 5 received a negative response. The validity and reliability of this questionnaire have been assessed through testing on a sample of 30 people. The findings indicated that the questionnaire demonstrated validity, as seen by the range of item correlations (r) falling

between 0.395 and 0.732. Additionally, the questionnaire exhibited reliability, as indicated by a Cronbach Alpha coefficient of 0.892.

The HPV vaccine awareness in this study was measured using the modified Awareness about Cervical Cancer, HPV, and HPV Vaccines Questionnaire (Bencherit et al., 2022). The questionnaire was first in English and has been subsequently translated into Bahasa Indonesia. Additionally, a readability test has been conducted on three members of the academic staff. The present questionnaire on awareness comprises a total of 6 inquiries. This inquiry offers two options for answers, specifically yes and no. Each accurate response was assigned a score of 1, whilst an erroneous response received a score of 0. All items in this questionnaire received positive ratings. In addition, a total of 30 participants were included in the study to assess the questionnaire's validity and reliability. The results indicated that the questionnaire was both valid and reliable, as evidenced by the range of item scores from 0.519 to 0.838 and a Cronbach Alpha coefficient of 0.714.

The univariate analysis and bivariate analysis were applied in this study. Univariate analysis was conducted by looking at the average distribution,

frequency distribution, percentage, and standard deviation results. Moreover, bivariate analysis was carried out to see whether there was a correlation between the two variables using the Spearman correlation test.

This study firmly holds the principles of confidentiality and is voluntary to the future participants. All respondents have explained the study protocol before signing the informed consent and joining the study. The study's protocol has received ethics approval from the health research ethics committee, Faculty of Medicine, Universitas Pembangunan Nasional "Veteran" Jakarta, with a letter number 163/V/2023/KEPK.

RESULTS

This study employed univariate analysis to examine the characteristics of the participants, specifically age, parental education, parental occupation, and parental income. A univariate analysis was performed to provide a comprehensive understanding of the knowledge and awareness of the HPV vaccine in adolescent girls from Angkasa Jakarta Junior High School and Budhi Warman Junior High School. The total number of respondents was 128. The outcomes of the univariate analysis are displayed in Table 1 below.

Table 1. Characteristics on age of middle school girls (n=128)

N	Mean	SD	Median	Min-Max.
128	13.41	1.133	13	12-23

Table 1 presents the average distribution of the characteristics of teenage girls according to age. The findings indicated that the mean age of adolescent females in this investigation was 14 years, with a standard deviation of 1.133. A significant proportion of the respondents, specifically 48.4%, were 13-year-old adolescent girls from Angkasa Jakarta Junior High School and Budhi Warman Junior High School. This group consisted of a total of 62 respondents.

Table 2 provides a comprehensive breakdown of the frequency distribution for the formal education, employment status, and monthly wage of the parents of adolescent girls. The findings indicate that a majority of the parents (60.2% or 77 out of 128 respondents) of adolescent girls had completed college degrees, reflecting their high educational attainment.

Table 2. Frequency distribution of formal education, employment, and salary per month of adolescent girls' parents (n=128)

Characteristics	n	%
Formal Education		
Junior High School	7	5.5
Senior High School	12	25
Vocational Degree	32	9.4
Bachelor's Degree	77	60.2

Occupation		
Not Working	4	3.1
Working	124	96.9
Income (salary per month)		
< 4.901.798 IDR	27	21.1
≥ 4.901.798 IDR	101	78.9

The results of the frequency and percentage distribution are derived from the parents' occupation. The vast majority of adolescent girls' parents, namely 124 out of 128 respondents (96.9%), have an occupation. A previous study indicated that individuals with limited income bear the cost of healthcare services, whilst those who are employed avail themselves of healthcare service (Oktarianita, Sartika, & Wati, 2021). Working people can access medical services because they are motivated to look after their health despite busy schedules.

Table 2 also informs that most of the parents' income of adolescent girls has a high gain of ≥ 4,901,798 IDR, as many as 101 respondents (78.9%) of 128 respondents. All revenue from labor is considered income; this includes money, items obtained through labor, and the product itself. The income value is expressed in terms of money at the going rate. Higher earners use health services at a higher rate than lower earners do.

Table 3. Distribution of Knowledge and Awareness of the HPV Vaccine (n=128)

Variable	Mean	SD	Median	Min-Max.
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Knowledge	12.89	7.545	12	0-30
Awareness	2.11	1.275	2	0-5

According to Table 3, the mean knowledge score of teenage girls at Angkasa Jakarta Junior High School and Budhi Junior High School is 12.89. The contestant received the lowest knowledge score of 0 due to erroneous answers. 30 out of 21 questions earned the highest score. Out of the total responders, 67 (52.3%) were adolescent girls with little knowledge, whereas 61 (47.7%) had excellent knowledge. The statistics were corroborated by respondents who said that they had never been provided with educational materials pertaining to cervical cancer and the HPV vaccine throughout their time in school.

Table 3 further validates the findings about the average distribution of awareness regarding the HPV vaccine in this investigation. The findings indicate that the mean awareness score for adolescent girls was 2.11. The majority of responders (80 participants, 62.5%) exhibited low awareness, whereas 48 participants (37.5%) demonstrated high awareness. The findings indicated a limited understanding of the HPV vaccination, potentially linked to insufficient knowledge regarding the HPV vaccine and the national immunization program inside the educational institution.

Table 4. Correlations of knowledge and awareness of human papillomavirus (HPV) vaccine among adolescent girls (n=128)

Variable	r Spearman	p-value
Correlations of Knowledge and Awareness of Human Papillomavirus (HPV) Vaccine Among Adolescent Girls	0.554	<0.001

Table 4 shows that the Spearman correlation test yields a p-value of less than 0.001. Statistically, there was a correlation between the level of knowledge and awareness of the HPV vaccine among adolescent females attending Angkasa Jakarta Junior High School and Budhi Warman Junior High School. The results show demonstrate a significant correlation between knowledge and awareness, with a positive direction of the correlation (r=0.554, p<0.001).

DISCUSSION

The univariate analysis revealed the demographic traits of the participants. Age is one of the factors that can influence knowledge, cognition, and mood. As we age, our cognitive abilities and ability for comprehension and critical thinking expand, leading to an accumulation of knowled (Budiman & Riyanto, 2013). Age can affect perception and reasoning skills.

Insight, understanding, and knowledge acquisition are concurrently developed as individuals age. The age at which vaccination occurs is intricately linked to one's educational background, gleaned from information obtained through diverse sources (Alwi, 2022). Consequently, it can be inferred that as adolescent girls grow older, their mindset becomes more mature. Moreover, with advancing age, these girls tend to attain a more comprehensive understanding, including knowledge about cervical cancer and the HPV vaccine.

Furthermore, this inquiry also examined demographic data regarding the educational qualifications of the participants. Education is a process that aims to shape the attitudes and behaviors of individuals and groups, promoting human maturity through learning. (Budiman & Riyanto, 2013). This study's findings indicate that most parents possessed an undergraduate level of education. This trend suggests that individuals with higher educational attainment are inclined to have an elevated capacity for acquiring information from various sources, including interpersonal interactions and media channels.

The connection between knowledge and education is unbreakable, and highly

educated individuals are expected to possess a broader scope of knowledge (Budiman & Riyanto, 2013). Education is a crucial component of behavioral change, and a higher education level can increase access to healthcare (Mariati, Ismail, & Hakimi, 2017). Individuals with greater knowledge and education are more inclined to actively pursue medical care for both themselves and their family. Individuals tend to seek out superior healthcare establishments when they possess knowledge and grasp the significance of preserving optimal health throughout their lifetimes. According to a prior investigation, parents who possess a good understanding of their children's health are more inclined to actively seek information regarding their own health and the health of their family (Mariati et al., 2017).

Acquiring knowledge and information usually comes from social interactions and the environment, and the relationship between education and knowledge is mutually reinforcing. Therefore, parents of highly educated teenage girls are more inclined to actively search for information on cervical cancer and the HPV vaccine, and also strive to enhance their access to healthcare facilities.

Moreover, this study also included a description of the participants' income. The examination of demographic factors shows that adolescent girls with employed parents are more likely to receive the HPV vaccine, even when there are fees involved with accessing these health services. Conversely, previous research suggests that moms who are not employed may carry out immunisations more efficiently, as they are not encumbered by the responsibilities of external work (Suaki, Qariati, & Widyarni, 2020).

Indeed, individuals with higher incomes have the capacity to allocate a portion of their earnings toward monitoring their health through available healthcare facilities (Oktarianita et al., 2021). In contrast, research underscores the substantial impact of costs, with the expense of HPV vaccination emerging as a critical factor influencing the likelihood of vaccination among mothers with lower incomes (Hurit, 2022). Subsequently, it can be inferred that parents' income level plays a pivotal role in determining whether adolescent girls receive vaccination against HPV.

Hereafter, this study provides an overview of the univariate analysis concerning knowledge and awareness, as illustrated in

Table 3. The research findings indicate that teenagers exhibiting supportive behaviors towards administering HPV vaccination displayed a commendable knowledge level of 96.7% (Rahmadini, Kusmiati, & Sunarti, 2022). In contrast, the cohort of teenagers displaying uncooperative behavior during the HPV vaccination process exhibited a 30.08% lower level of knowledge. The lack of HPV vaccination among teenagers can be attributed to their limited understanding of the vaccine's benefits and purposes, compounded by a lack of exposure to health information regarding the HPV vaccine.

The knowledge of college students tends to advance when they are exposed to information about cervical cancer within their educational materials (Rahayu, Widyawati, & Lismidiati, 2018). Proficiency in understanding HPV vaccination forms the foundation for developing an interest in the subject. A more extensive and elevated level of knowledge correlates with a heightened level of interest (Ayumaruti & Anshari, 2023). There is an urgent need for reproductive health education, particularly for adolescents entering puberty. Providing health education plays an imperative role in influencing students' knowledge and behavioral patterns pertaining to the

promotion of reproductive health (Marcelina, Samaria, & Trisnawati, 2023).

The ease of adopting new behaviors is facilitated by a combination of factors, including sound knowledge, self-confidence, and a positive attitude. This aligns with the notion that a heightened level of knowledge contributes to more favorable behaviors in pursuit of specific goals, such as adopting health messages for cervical cancer prevention through HPV vaccination (Rahmadini et al., 2022).

Table 3 also discusses awareness of HPV vaccines, a theme that resonates with a previous study on university students in Morocco, revealing that a substantial 92.2% of respondents exhibited low awareness of the HPV vaccine (Yacouti et al., 2022). Intriguingly, only 18.1% reported having no awareness of cervical cancer. These disparities may be attributed to cultural differences and religious sensitivities between countries, factors that substantially constrain sexual education and awareness efforts.

The bivariate analysis reveals a significant association between knowledge and awareness, indicating a positive correlation between the two variables, which

necessitates additional discussion. Supporting this discovery, a previous study revealed that knowledge of HPV infection was more widespread among university students between the ages of 22 and 28 in comparison to those between the ages of 17 and 21 (El Mansouri et al., 2022). Moreover, graduate students exhibited a greater propensity for being cognizant of HPV infection as compared to undergraduate students. The heightened consciousness can likely be ascribed to the existence of efficacious educational initiatives aimed at enhancing awareness regarding cervical cancer and the HPV vaccine.

Contrasting results emerged from a study revealing that among respondents with knowledge of HPV, less than half (46%) were aware that HPV constitutes the primary cause of cervical cancer (Issa et al., 2021). Likewise, out of the individuals that were informed about HPV, just 52% possessed awareness of the HPV vaccine. This indicates that the level of awareness regarding HPV exceeds the level of understanding of its complexities. Hence, a profound understanding of HPV does not automatically align with a comprehensive knowledge of the virus, underscoring the disparity between broad awareness and in-depth knowledge.

An antecedent study has indicated that despite vaccination being the most effective method for preventing HPV-related cancer, approximately 39.5% of the female students surveyed exhibited poor knowledge about the HPV vaccine, shedding light on the limited awareness among students regarding HPV infection (Bencherit et al., 2022). While there is a robust level of awareness about cervical cancer among 84.6% of female college students, only 26.6% are cognizant of the availability of cervical cancer screening tests, and a mere 14% are acquainted with the Pap Smear test. The nearly twofold increase in knowledge and awareness of cervical cancer screening tests in the referenced studies may be attributed to variations in the target populations' age ranges compared to the current research's demographic focus.

Indeed, various factors play a crucial role in influencing knowledge, encompassing education, social culture, environment, experience, and age. Higher educational attainment correlates with an increased likelihood of individuals acquiring information from diverse sources, including interpersonal interactions and media channels (Budiman & Riyanto, 2013). Education serves as a fundamental conduit

for obtaining information, particularly in the realm of health information. Asserting that students' knowledge tends to be more robust when they have been exposed to information about cervical cancer within their educational materials. This underscores the significant impact of educational experiences on knowledge acquisition (Rahayu et al., 2018).

Certainly, the level of education exerts a significant influence on the acquisition of knowledge. Individuals with higher levels of education are more likely to attain a more advanced and comprehensive knowledge base (Samaria, 2022). This connection between education and knowledge is further underscored by research findings, which indicate positive associations between educational levels and awareness of HPV, knowledge of HPV as the primary cause of cervical cancer, and awareness of the HPV vaccine (Issa et al., 2021). These findings imply that individuals with higher levels of education have increased opportunities to acquire knowledge about HPV compared to those with lower educational levels (El Mansouri et al., 2022). Education thus serves as a critical determinant shaping individuals' awareness and understanding of topics related to HPV.

Implementing effective prevention strategies is paramount in reducing the incidence of cervical cancer. Providing information about HPV infection and HPV vaccination is vital as it contributes significantly to cervical cancer prevention. Awareness campaigns, screening programs, and vaccination initiatives are key components of the comprehensive prevention measures against this disease. By promoting awareness and ensuring access to preventive measures, societies can work towards reducing the burden of cervical cancer and safeguarding the health of individuals, particularly women. Education and proactive healthcare measures are central to fostering a healthier community and preventing the onset of cervical cancer.

Hence, knowledge on HPV infection and HPV vaccine is vital as it significantly contributes to the prevention of cervical cancer. Through the dissemination of knowledge on the potential dangers linked to HPV and the advantages of immunisations, we can enable individuals to make well-informed choices regarding their well-being. Cervical cancer prevention involves a comprehensive strategy that includes raising awareness through campaigns to spread information, implementing screening program for early identification, and

importantly, administering vaccinations to safeguard against the predominant HPV strains linked to cervical cancer. By making these focused and coordinated endeavors, we can strive to decrease the occurrence of cervical cancer and enhance the overall welfare of the community.

CONCLUSION

A foundational understanding of the HPV vaccination is crucial for generating interest and fostering a positive attitude towards it. The study's findings revealed a low awareness of the HPV vaccine among adolescent girls, possibly indicating gaps in HPV vaccine education within schools and national immunization programs.

Healthcare providers are encouraged to deliver precise and easily comprehensible education on cervical cancer and the advantages of HPV vaccination, specially tailored for adolescent girls. Furthermore, extending this education to families is essential, aiming to increase overall awareness and knowledge about the HPV vaccine. Family support is very important to ensure adolescent girls receive the necessary backing for HPV vaccination.

To enhance the reach of HPV vaccination programs, collaboration between health

services and schools is recommended. Schools can serve as valuable partners in administering the HPV vaccine, and incorporating cancer-related health education into school curricula can further contribute to comprehensive preventive measures.

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