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

Raras Dwinova[1], Dora Samaria[2]
[1-2] Faculty of Health Sciences, Universitas Pembangunan Nasional "Veteran" Jakarta, Indonesia
Email: dora.samaria@upnvj.ac.id

STRACT
Cervical cancer is significantly increased by the human Papillomavirus (HPV). The HPV vaccine can be administered as a primary preventive to stop cervical cancer. Cervical cancer can be prevented most effectively with vaccination. The decision to acquire the HPV vaccine is influenced by factors related knowledge and awareness of the disease. 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. One hundred twenty-eight respondents were selected using a cluster random sampling. This study employed the Knowledge regarding HPV, Cervical Cancer, and HPV Vaccine Questionnaire and Awareness about Cervical Cancer, HPV, and HPV Vaccines Questionnaire, all 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-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

Human Papillomavirus (HPV) is indeed a significant risk factor for cervical cancer. It's important to note that while HPV is a leading cause, it is not the sole factor, and not all women with HPV will develop cervical cancer. The development of cervical cancer is influenced by various factors, including other risk factors such as smoking and HIV infection. These additional risk factors can enhance the likelihood that women infected with HPV may progress to cervical cancer. Thus, nuanced understanding is crucial for public health awareness and individual healthcare decisions, emphasizing the importance of addressing multiple risk factors for effective cervical cancer prevention and management (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 is still the cancer that affects the second-highest number of people in Indonesia after breast cancer. The incidence of new cases of cervical cancer among women in Indonesia is around 36,633 cases (9.2%), with a mortality rate of 21,003 (9%) (The Global Cancer Observatory, 2021b). According to the facts, many women

worldwide, including those in Indonesia, continue to suffer from cervical cancer.

Vaccines are the most effective way to prevent cervical cancer and other sexually transmitted cancers. Individuals need to be immunized at an early age before they become sexually active (Ersado, 2021). The World Health Organization (WHO) states that the leading target group in most countries that recommends HPV vaccination are adolescent girls aged 9-14 years (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 are more knowledgeable than junior high school girls. According to a previous study conducted in India, older college students were more knowledgeable about HPV and cervical cancer than their younger peers. Age is a common reason for refusing or delaying HPV vaccination, and older girls are more likely to be vaccinated than younger girls (Rancic et al., 2022).

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). Awareness of cervical cancer and the HPV vaccine, willingness to get Pap Smear tests in the future, and belief that cervical cancer is a lethal cancer were related to the desire to get the HPV vaccine in the future. This study aimed to determine the relationship between knowledge and awareness of 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. Based on the results of sample calculations using the Slovin formula, the number of samples obtained was 128 respondents. The results of calculating the number of samples for each school using cluster random sampling obtained as many as 87 students

at Angkasa Jakarta Junior High School and 42 students from Budhi Warman Junior High School students. Those who already received HPV vaccination were excluded from 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.

In this study, the demographic questionnaire was filled with data on the characteristics of the respondents, namely age, parents' education, parents' occupation, and parents' income. The questionnaire used to measure the knowledge variable about the HPV vaccine in this study was the Knowledge regarding HPV, Cervical Cancer, and the HPV vaccine Questionnaire (Winarto et al., 2022). This questionnaire was originally written in Bahasa Indonesia. This questionnaire consists of 21 questions divided into two parts. The first part contains inquiries related to knowledge about HPV infection and cervical cancer. In addition, the second part includes questions related to the HPV vaccine. Each correct answer was given a score of 2, while an incorrect answer or did not know the answer got a score of 0. Of all the questionnaire items, only item number 5 was unfavorable. This questionnaire has been tested on 30 participants for validity and reliability. The results showed that this questionnaire was valid with r items ranging from 0.395 to 0.732 and reliable with a Cronbach Alpha 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). This questionnaire was originally in English, so it has been translated into Bahasa Indonesia, and a readability test has been carried out on three academic staff. This awareness questionnaire consists of 6 questions. This questionnaire has two answer choices, namely yes and no. Each correct answer was given a value of 1, while an incorrect answer got 0. All items in this questionnaire were favorable. Additionally, 30 subjects were involved to examine the validity and reliability of this questionnaire. The findings demonstrated the validity and reliability of the questionnaire, with r items ranging from 0.519 to 0.838 and a Cronbach Alpha 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

In this study, the univariate analysis proposed to explain the characteristics of the respondents, namely age, parents' education, parents' occupation, and parents' income. Univariate analysis was also conducted to understand an overview of knowledge and awareness of the HPV vaccine in adolescent girls at Angkasa Jakarta Junior High School and Budhi Warman Junior High School, totaling 128 respondents. The results of univariate analysis can be seen on Table 1 below.

Table 1. Characteristics on age of middle school girls

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

Table 1 depicts the results of the average distribution of the characteristics of adolescent girls by age. The results showed that the average age of teenage girls in this study was 14 years, with a deviation standard of 1.133. Many adolescent girls at Angkasa Jakarta Junior High School and Budhi Warman Junior High School were 13 years old, with 62 respondents (48.4%).

The frequency distribution of formal education, employment, and salary per month of adolescent girls' parents are explained in Table 2. Based on parents' educational background of adolescent girls, the results reveal that 77 respondents (60.2%) out of 128 respondents had undergraduate degrees, representing most of the parents' educational attainment.

Table 2. Frequency distribution of formal education, employment, and salary per month of adolescent girls' parents

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 distribution of frequencies and percentages are based on the parents' occupation. Many adolescent girls' parents have an occupation, with 124 respondents (96.9%) of 128 respondents. A prior study reported that low-income respondents pay for health services, while those with jobs use health services (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 earner does.

Table 3. Distribution of Knowledge and Awareness of the HPV Vaccine

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

Based on Table 3, the average knowledge score of adolescent girls at Angkasa Jakarta Junior High School and Budhi Junior High School is 12.89. The lowest knowledge score was obtained at 0 because the participant answered incorrectly. The highest score was obtained by 30 out of 21 questions. Adolescent girls with low knowledge comprised 67 (52.3%) respondents, whereas 61 (47.7%) had high knowledge. These data were supported by respondents who stated that they had never received learning materials related to cervical cancer and the HPV vaccine at school.

Table 3 also confirms the results of the average distribution of awareness of the HPV vaccine in this study. The results reveal that the average awareness score for adolescent girls was 2.11. Most respondents (80 participants, 62.5%) had low awareness, while 48 participants (37.5%) had high awareness. The results showed a shallow level of awareness of the HPV vaccine, possibly related to the lack of education about the HPV vaccine and the national vaccine program at the school.

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

According to Table 4, the Spearman correlation test reveals a p-value of <0.001. It means that statistically, there was a relationship between knowledge and awareness of the HPV vaccine in adolescent girls at Angkasa Jakarta Junior High School and Budhi Warman Junior High School. The results also indicate a strong relationship between knowledge and awareness with a positive direction of the relationship (r=0.554, p<0.001).

DISCUSSION

The univariate analysis demonstrated the demographic characteristics of respondents. One of the variables that can impact knowledge, comprehension, and mood is age. As we get older, our capacity

for understanding and thinking skills grows, and the knowledge gained increases (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.

In addition, this investigation also explored demographic data pertaining to the educational background of the participants. Education is a transformative process aimed at shaping the attitudes and behaviors of individuals and groups, fostering 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). The more information and education a person has, the more likely they are to seek medical attention for themselves and their family. People are inclined to look for a better health facility when they are well-informed and understand the importance of maintaining good health throughout their lives. A previous study suggests parents knowledgeable about their children's health are more likely to seek information about their own and their family's health (Mariati et al., 2017).

Obtaining knowledge and information typically originates from social connections and the surrounding environment, and the correlation between education and knowledge is reciprocal. Hence, the parents of well-educated adolescent girls are more likely to actively seek information regarding cervical cancer and the HPV vaccine, as well as pursue improved access to healthcare services.

Furthermore, this study also delves into the examination of respondents' income. The outcomes derived from the analysis of demographic characteristics indicate that adolescent girls whose parents are employed exhibit an increased likelihood of receiving the HPV vaccine, despite the associated costs for accessing these health

services. In contrast, findings from prior studies propose that mothers who are not engaged in employment may execute immunizations more effectively, unburdened by the demands of external employment (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, uncovering a noteworthy relationship between knowledge and awareness and establishing a positive correlation between the two, prompts further discussion. Corroborating this finding, a preceding study indicated that awareness regarding HPV infection was more prevalent among university students aged 22 to 28 compared to their counterparts aged 17 to 21 (El Mansouri et al., 2022). In addition, graduate students disclosed a higher likelihood of being aware of HPV infection in contrast to undergraduate students. This elevated awareness could potentially be attributed to the presence of effective education programs designed to raise awareness about 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). Similarly, among those aware of HPV, only half (52%) had knowledge of the HPV vaccine. This suggests that awareness of HPV surpasses knowledge of its intricacies. Therefore, a high level of awareness of HPV does not necessarily correspond to a high level of knowledge about the virus, highlighting a distinction between general awareness and detailed 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 is 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.

Therefore, information about HPV infection and HPV vaccination is important because it plays a crucial role in preventing cervical cancer. By educating individuals about the risks associated with HPV and the benefits of vaccinations, we can empower people to make informed decisions about their health. Prevention measures against cervical cancer encompass a multi-faceted approach, including awareness campaigns to disseminate information, screening programs for early detection, and notably, vaccinations to protect against the most common HPV strains associated with cervical cancer. It's through these concerted efforts that we can work towards reducing the incidence of cervical cancer and promoting overall community well-being.

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.

The bivariate analysis results affirm a significant relationship between knowledge and awareness of the HPV vaccine among adolescent girls at Angkasa Jakarta Junior High School and Budhi Warman Junior High School. This study suggests that there is an urgent need for teenage girls to enhance their knowledge of cervical cancer and the HPV vaccine. Accessible information through health services is crucial to empower teenage girls with an understanding of the benefits and objectives of HPV vaccination.

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 pivotal in ensuring adolescent girls receive the necessary backing for HPV vaccination.

The authors anticipate that this study sheds light on the existing gaps in knowledge among adolescent girls regarding cervical cancer and the HV vaccine. Consequently, health services, particularly health centers, should intensify HPV vaccination programs to achieve maximum coverage and mitigate the incidence of cervical cancer in Indonesia.

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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