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Relationship between knowledge and attitude about human papillomavirus infection and vaccination in female nursing students

Relación entre el conocimiento y la actitud sobre la infección por el virus del papiloma humano y la vacunación en las estudiantes de enfermería

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SUMMARY

Introduction: *Human papillomavirus (HPV) infection is the primary cause of cervical cancer, which is the second-leading cause of women's death in Indonesia, and that is why a national HPV vaccination program is required to address this issue. A preliminary survey of 20 female nursing students revealed that 70 % were unaware of the HPV virus, 80 % were unaware of cervical cancer, and 80 % were unaware that HPV could lead to cervical cancer. This study aimed to determine the relationship between knowledge and attitude about human papillomavirus infection and vaccination in female nursing students.* **Methods:** *This descriptive-quantitative study used a cross-sectional design and univariate and bivariate analysis. The purposive sampling method was used to select 199 first-year female nursing students who were willing to participate in the research and had no history of HPV infection, HPV vaccination, or cervical cancer. The study was conducted from February to April 2024.* **Results:** *The study showed that 29.14 % had moderate knowledge and a positive attitude about HPV infection, with p = 0.261 (p > 0.05), indicating no significant relationship. A positive attitude does not always affect knowledge. 43.72 % had good knowledge and a positive attitude about HPV vaccination, with p=0.021 (p < 0.05), indicating a significant relationship. Good knowledge produces a positive attitude.* **Conclusion:** *Despite not having studied maternity, individuals can still gain valuable knowledge from their sources of information. This study will reach people to prevent HPV infection and implement vaccination programs, and future researchers can conduct multivariate analyses of variables.*

Keywords: *Nursing students, papillomavirus infections, vaccination.*

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RESUMEN

Introducción: *La infección por el virus del papiloma humano (VPH) es la causa principal del cáncer de cuello uterino, que es la segunda causa de muerte de mujeres en Indonesia, y por eso es necesario un programa nacional de vacunación contra el VPH para abordar este problema. Una encuesta preliminar realizada a 20 estudiantes de enfermería reveló que el 70 % desconocía el VPH, el 80 % desconocía la*

existencia del cáncer de cuello de útero y el 80 % ignoraba que el VPH podía provocar cáncer de cuello de útero. El objetivo de este estudio fue determinar la relación entre los conocimientos y la actitud acerca de la infección por el virus del papiloma humano y la vacunación en las estudiantes de enfermería. **Métodos:** *Descriptivo-cuantitativo con un diseño transversal, con análisis univariado y bivariado. Se utilizó el método de muestreo intencional para seleccionar una muestra de 199 estudiantes de enfermería de primer curso que estuvieran dispuestas a participar en la investigación y no tuvieran antecedentes de infección por el VPH, vacunación contra el VPH o cáncer de cuello uterino. Esta investigación se llevó a cabo en febrero-abril de 2024.* **Resultados:** *El estudio mostró que el 29,14 % tenía un conocimiento moderado y una actitud positiva sobre la infección por VPH, con p = 0,261 (p > 0,05), lo que indica que no existe una relación significativa. Una actitud positiva no siempre afecta los conocimientos. El 43,72 % tiene buenos conocimientos y una actitud positiva sobre la vacunación contra el VPH, con p = 0,021 (p < 0,05), lo que indica una relación significativa. Un buen conocimiento produce una actitud positiva.* **Conclusión:** *A pesar de no haber estudiado maternidad, las personas pueden adquirir conocimientos valiosos de sus fuentes de información. Este estudio llegará a las personas para prevenir la infección por el VPH e implementar programas de vacunación, y futuros investigadores podrán realizar análisis multivariados de las variables.*

Palabras clave: Estudiantes de enfermería, infecciones por papilomavirus, vacunación.

INTRODUCTION

Cervical cancer is a disease in which malignant (cancer) cells form in the tissues of the cervix (1). Cervical cancer ranked fourth as the killer cancer in women in the world in 2020 (2), which previously ranked fifth in 2010 (3) and estimated that 342 000 of 604 000 women with cervical cancer have died. In Indonesia, cervical cancer ranks second as the female killer disease, where 21 003 of 36 633 women with cervical cancer have died (2). Cervical cancer is caused by several factors, of which 90 % is caused by human papillomavirus infection (4).

Human papillomavirus (HPV) infection is a sexually transmitted disease that can cause warts around the genital area (5). Human papillomavirus infection commonly affects women aged <25 years, and it takes decades for human papillomavirus infection to develop into cervical cancer (6). Data from the Centers for Disease Control show that approximately 43 million late adolescent-aged people in the world were infected with human papillomavirus in 2018 (5), and by 2023, it is estimated that 4.0 % of women in Indonesia will have a human papillomavirus 16/18 infection (7). Therefore, human papillomavirus infection must be avoided before the risk factor grows through vaccination before sexual contact. Unfortunately, only 1 in 10 girls aged 9-14 years in Indonesia have received the human papillomavirus vaccine until the last dose in 2020. In 2030, the WHO targets that 90 % of women in Indonesia will have gotten their previous dose of vaccine by age 15 (8).

Knowledge is a factor that plays an important role in shaping a person's attitude (8). According to a survey, 62 % of women in Indonesia experience infections in the pubic area; one of them is HPV infection because of their lack of knowledge about maintaining the hygiene of their reproductive organs (9). People who had heard about HPV infection during their degree program were more likely to know the risk factors of HPV infection and were willing to do HPV vaccination (10). Fitri and Akbar (11) have a different opinion; even if someone has not learned about maternity yet, they can still learn about HPV infection and vaccination through experience or other sources of information.

A preliminary survey of 20 female nursing students revealed that 70 % were unaware of the HPV virus, 80 % were unaware of cervical cancer, and 80 % were unaware that HPV could lead to cervical cancer. One of the 20 female nursing students has a cervical cancer history in her family. As future healthcare providers who will provide health education to patients or the community, nursing students must be more sensitive to this issue (12), given that cervical cancer remains a significant concern for women in Indonesia and around the world. This lack of knowledge can also determine the attitude about HPV infection and vaccination, especially among female nursing students, to be negative, so the risk of cervical cancer could be difficult to avoid. Fitri and Elvian (13) demonstrated that most respondents had low knowledge, which resulted in a negative attitude about HPV infection.

This study aimed to determine the relationship between knowledge and attitude about human papillomavirus infection and vaccination in female nursing students as the institution is beginning to increase the understanding of female nursing students about the importance of the HPV vaccine and facilitate the HPV vaccine program.

METHODS

Study Design

This study used a quantitative descriptive method with a cross-sectional design. This design is used to collect data about knowledge and attitude simultaneously.

Population, Samples, and Sampling

Of the 396 first-year female nursing students at one of the private universities in Banten, 199 were chosen as samples using the purposive sampling technique with the Slovin formula. The inclusions were first-year female nursing students who were enrolled, willing to become respondents, aged 18 years old and above, and Indonesian. The exclusions were a history of HPV infection, vaccination, and cervical cancer. There are two variables: knowledge, which is independent, and attitude, which is dependent.

Instrument

The questionnaire used in this study was taken from Fitri and Akbar's research (11), which has been tested for validity and reliability. The knowledge questionnaire scores each question as 1 = true and 0 = false for positive statements and as 1 = false and 0 = true for negative statements. This variable uses an ordinal scale, with good measurement results: 76 %-100 %, sufficient 56 %-75 %, and low: <56 % (14). Each question from the attitude questionnaire is scored four = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree for positive statements, and 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree for negative statements. This variable uses a nominal scale, with positive measurement results if the total score ≥ median and negative if the total score < median (15). The questionnaire has been tested for validity; each question has an r count > r table (0.306). The previous author has also tested it for reliability, and the instrument is reliable if Cronbach's alpha reliability coefficient is greater than 0.70 (ri >0.70).

Procedure

This research was conducted from February to April 2024. The authors created the questionnaire into a Google Forms page. Data collection occurred using the Google Forms link by applying two instruments: a questionnaire written by the researchers themselves and a questionnaire regarding knowledge and attitude about HPV infection and vaccination. The first questionnaire asked about the respondents' characteristics, age, educational background of students, mother, father, and source of information. The second questionnaire has 40 questions, ten for each variable.

Data Analysis

This study used univariate and bivariate data analysis techniques. Univariate analysis explained the frequency of the characteristics of respondents, as well as their knowledge and attitude about HPV infection and vaccination. This study also conducted a bivariate analysis to cross the knowledge and attitudes about HPV infection and vaccination using the Chi-Square test. This statistical method measures the level of dependence between two variables.

Ethical Clearance

This study has complied with the ethical aspects of this research and was approved by the Research Ethics Committee of Faculty Nursing with a number of 018/KEPFON/I/202. All participants agreed with the informed consent in the Google Form, where they clicked on the option "I accept to participate in the study".

RESULTS

Table 1 shows that there are 199 female nursing students. 94 (47.2 %) respondents were 18 years old, and the education background of 182 (91.5 %) was non-health vocational high school. In this study, most of the educational backgrounds of the father (48.7 %) and mother (45.7 %) of the respondents were senior high school students. This study revealed that 131 (65.8 %) respondents had never heard about human papillomavirus, and 44 (22.1 %) had never heard of HPV from the internet or social media.

Table 1

Distribution of Characteristics of Respondents

Respondent Characteristic	n	%
Age		
18 years old	94	47.2
19 years old	78	39.2
20 years old	21	10.6
21 years old	6	3.0
Education Background		
Health Vocational High School	17	8.5
Nonhealth vocational high school	182	91.5
Father's Education		
Not in school	4	2.0
Elementary school	15	7.5
Junior high school	14	7.0
Senior high school	97	48.7
College degree	69	34.7
Mother's Education		
Not in school	2	1.0
Elementary school	17	8.5
Junior high school	91	45.7
College degree	66	33.2
Source of Information		
Never	131	65.8
Family member	2	1.0
Health worker	4	2.0
Teacher	6	3.0
Newspaper/Magazine	1	0.5
Friends	3	1.5
Internet/social media	44	22.1
School	7	3.5
Television/Radio	1	0.5

Table 2

Knowledge about HPV Infection

Category	n	%
Low	34	17.1
Moderate	86	43.2
Good	79	39.7

Table 3

Frequency Distribution of Knowledge about HPV Infection

Question	True	False
1. HPV infection is the main cause of cervical cancer	96.0	6
2. Sexual contact can transmit HPV infection	91.5	8.5
3. If you married more than once, HPV infection can occur	66.8	33.2
4. HPV infection can occur in dolescence	95.0	5.0
5. If you have family a family history of uterine cancer, HPV infection may occur	29.1	70.9
6. HPV infection can occur in someone who has never had sexual intercourse	52.3	47.7
7. Blood cannot transmit HPV infection	47.7	52.3
8. HPV infection can affect men	77.9	22.1
9. Mouth contact transmits HPV virus infection	57.8	42.2
10. The transmission period for HPV infection is 2-8 months	93.0	7,0

Table 4

Attitude about HPV Infection

Category	n	%
Negative	77	38.7
Positive	122	61.3

Table 5

Relationship between Knowledge and Attitude about HPV Infection

Knowledge	Attitude						p-value
	Positive		Negative		Total		
	n	%	n	%	n	%	
Low	18	9.05	16	8.04	34	17.09	
Moderate	58	29.14	28	14.07	86	43.22	0.261
Good	46	23.16	33	16.58	79	39.07	

Table 6

Knowledge about HPV Vaccination

Category	n	%
Low	7	3.5
Moderate	46	23.1
Good	146	73.4

Table 7

Frequency Distribution of Knowledge about HPV Vaccination

Question	True	False
1. The recommended immunization program in Indonesia includes HPV vaccination	89.9	10.1
2. HPV vaccination is one of the secondary preventative measures against uterine cancer	3.5	96.5
3. HPV vaccination can protect against cervical cancer and genital warts	99.0	1.0
4. HPV vaccination is important for women who have more than one sex partner	93.0	7.0
5. Both males and females can receive vaccinations	94.5	5.5
6. HPV vaccination in Indonesia is mandatory for ages 10-13 years old	63.3	36.7
7. Two types of HPV vaccines are currently on the market	90.5	9.5
8. HPV vaccination is done in the upper arm area	93.0	7.0
9. The HPV vaccination is given from 9 to 26 years of age	86.9	13.1
10. There are three doses of the HPV vaccinatio	92.0	8.0

Table 8

Attitude about HPV Vaccination

Category	n	%
Negative	92	46.2
Positive	107	53.8

Table 9

Relationship between Knowledge and Attitude about HPV Vaccination

Knowledge	Attitude						p-value
	Positive		Negative		Total		
	n	%	n	%	n	%	
Low	2	1.01	5	2.51	7	3.52	
Moderate	28	9.05	28	14.07	46	23.12	0.021
Good	87	43.72	59	29.65	146	73.37	

Table 2 shows that 43.2 % of female nursing students knew moderately about HPV infection. Table 3 shows that the majority (96 %) of female nursing students can answer correctly the question about HPV infection as the main cause of cancer cervix, but 70.9 % answered wrong on the question about the history of cancer cervix as the support factor of HPV infection. Table 4 shows that 61.3 % of female nursing students had a positive attitude about HPV infection. Table 5 shows that 29.14 % of female nursing students had moderate knowledge and positive attitudes. The results of this study were analyzed using the Chi-Square test and tested bivariate analysis. The result indicated a $p = 0.261$ ($p > 0.05$), which means there is no significant relationship between knowledge and attitude about human papillomavirus infection in nursing students.

Table 6 shows that 73.4 % of female nursing students had good knowledge about HPV vaccination. Table 7 shows that the majority of 99 % of female nursing students answered correctly on the question about HPV vaccination as protection from cervical cancer and genital warts, but 96.5 % answered wrong on the question about HPV vaccination as the secondary prevention of cervical cancer. Table 8 shows that 53.8 % of female nursing students had a positive attitude about HPV, and Table 9 shows that the majority of 87 (43.72 %) female nursing students had good knowledge and a positive attitude. The results of this study were analyzed using a Chi-Square test and bivariate analysis. They showed that $p = 0.021$ ($p<0.05$), which means there is a significant relationship between knowledge and attitude about human papillomavirus vaccination in nursing students.

DISCUSSION

Our findings revealed that approximately 47.2 % of respondents were 18 years old. This result aligns with research conducted by Fajarini (17), where 82 % of respondents were between 18 and 19 years old. This is not in line with Simanjuntak and Sugiharto (18), who reported that 70 respondents were 16 years old (18). Age influences a person's capture power and mindset, suggesting that the older an individual, the greater the knowledge they may acquire (19).

The study shows 182 respondents (91.5 %) were from non-health vocational high schools, contrary to the report by Setyaningrum et al. (20), where 105 (87.5 %) respondents were students studying medicine, pharmacy, and midwifery. Students with a health education background have greater access to health-related information through lectures, seminars, and other print and electronic media.

Our study found that the majority of the educational background of the father (48.7 %) and mother (45.7 %) of the respondents was senior high school. This is consistent with Saragih et al. (21), who found that the educational background of 96 (51.9 %) respondents' parents was senior high school. According to Tang et al. (22), high school students' understanding of HPV is influenced by the educational background of their parents. This does not support the findings of Zakina (23), where the educational background of the mother of 29 (53.7 %) respondents was a bachelor's degree.

Our findings showed that 131 (65.8 %) respondents never received information about HPV and 44 (22.1 %) respondents received information from the internet or social media. This is supported by Fentia (24) who indicated that 55 (60.4 %) respondents never received information about HPV because most respondents were housewives, so they did not recognize HPV. This is not aligned with Hurst's (25), who demonstrated that 21 (65.5 %) respondents received information from electronic and digital media. Health information that has been read, heard, or seen by the community can affect knowledge and impact decision-making. Fuadah et al. (12) found that 77 (81.1 %) respondents had heard about cervical cancer and its prevention from university lectures because they were undergraduate nursing students who had received the material.

Our study's findings show that 86 (43.2 %) respondents had moderate knowledge about HPV infection. This is consistent with Fitri and Akbar (11), who reported that 77 (51.7 %) respondents had moderate knowledge because they were still in junior and senior high school.

However, it is still possible that some respondents may have learned about HPV infection from personal experience or the media (11). This is not in line with Galvão et al. (26), who showed that 72.2 % of respondents had low knowledge because the respondents were only 15 years old and may not have received information about HPV infection. Older age can affect the level of ability and maturity in thinking and receiving better information compared to a younger age (27).

Our study showed that 122 (61.3 %) respondents were positive about HPV infection. This is in line with Fitri and Akbar study (11), in which 122 (81.3 %) respondents showed a good attitude about HPV infection because respondents had good knowledge about HPV infection and 43.3 % of respondents were 18-19 years old. Furthermore, age plays a significant role in shaping an individual's capture power and mindset. This is not in line with research conducted by Fitri and Elviany (13), where the majority of 51 (53.0 %) respondents had a negative attitude about HPV infection due to low knowledge, a lower education level, and the majority of respondents did not work, so they received limited information or even did not receive any information from health workers or non-health workers about HPV infection (28). According to Nurbaiti (29), the higher a person's knowledge, the easier it is for that person to receive information, where knowledge can determine attitudes or actions to be taken. Our study concludes that parents' age and education level and sources of information can affect attitudes. One thing that distinguishes the results of this study is that they have a positive attitude. In Fitri and Elviany (13), respondents had a low level of education, and some did not work, so they received limited information or did not get information from health workers or non-health workers about infections, so respondents had a negative attitude.

Our study found that the majority of 58 (29.14.%) respondents had moderate knowledge and a positive attitude, where $p=0.261$ ($p>0.05$), meaning there is no significant relationship between knowledge and attitude about HPV infection in female nursing students. This is in line with Villanueva et al. (30), who show that most respondents have moderate knowledge (54.34 ± 0.9 %) and a positive attitude (2.34 ± 0.03 %) because they still do not know about HPV infection in terms of etiology, people at risk, diagnosis, and treatment. Winarto et al. (31) conclude that several factors can affect attitude, such as a high level of father's education, which tends to make respondents have high concerns if the family or closest people will get cervical cancer, the influence of the mother's education level when receiving rumor related to HPV from the family, and the age of respondents less than 25 years, which makes them easy to believe and look for sources of information. On the contrary, Fitri and Akbar (11) indicate that 77 (51.7 %) respondents had moderate knowledge and 122 (81.3 %) had a good attitude, with a p-value of 0.047 ($p < 0.05$) because students get information from the media and experience, even though they have not studied maternity. Attitude is influenced by three components, namely cognitive, affective, and conative (32). Our study concludes that affective and cognitive components affect the positive attitude of the respondents, where parents' age and educational background can influence both.

Our study's findings demonstrated that 146 (73.4 %) respondents had good knowledge about HPV vaccination. This study is consistent with Mulia et al. (33), who found that approximately 41 (50.0 %) nursing students had a good knowledge of the HPV vaccine because 65/8 % came from second- and third-year nursing students who have learned about maternity. This contradicts study findings by Dethan and Suariyani (34), showing that 50 % of respondents had moderate knowledge about HPV vaccination because the respondents were first-grade senior high school students who were not exposed to health information, which can affect the students' low knowledge. The questionnaire showed that most respondents could answer most of the questions correctly, except about the HPV vaccine as a secondary prevention, whereas vaccination is the primary prevention. Our study concludes that the source of information and parents' educational background impact the respondents' knowledge.

Our study showed 107 (53.8 %) students were positive about HPV vaccination. This is in line with Mulia et al. (33), where 78 (99.1 %)

respondents had a positive attitude about HPV vaccination because respondents had good knowledge about HPV vaccination (33). This research does not align with Rahmayanti et al. (35), where 51 (51 %) respondents had a negative attitude because of sufficient knowledge and was not maximized in obtaining information about HPV vaccination. Our study concludes that the positive attitude about HPV vaccination can be affected by good knowledge.

Our study found that 87 (43.72 %) respondents had good knowledge and a positive attitude about HPV vaccination, with $p = 0.021$ ($p < 0.05$), which means there is a significant relationship between knowledge and attitude about HPV vaccination. This is in line with Mulia et al. (33), where 78 (95.1 %) female students had good and moderate knowledge as well as a positive attitude about the HPV vaccination, with $p = 0.0001$ ($p < 0.05$), which shows a significant relationship because the majority of respondents were in their second and third years of nursing college, which already includes maternity classes (33). This is not in line with Lubeya et al. (36), where the p-value is 0.670 ($p > 0.05$), which indicates that there is no significant relationship because most respondents come from *Joint Research Management Office (*JRMO) and registrars, whose experience handling cases related to HPV is less than that of consultants. Our study concludes that the higher the female students' knowledge of HPV vaccination, the more positive their attitude is. This shows that, although almost all respondents have not learned more about maternity science because they are still first-year students, some respondents may have received information about HPV vaccination through media or experiences, such as social media. Therefore, it is expected that educational institutions can increase the dissemination of information about HPV infection and vaccination through social media.

This study has some limitations. First, reaching the target number of respondents in a month is difficult, so the authors collaborated with representatives of small groups to distribute questionnaires. Second, finding research journals with the same respondents as ours wasn't easy, so the authors added journals with health students as respondents.

CONCLUSION

Even though they have never learned about maternity, individuals can still gain knowledge from information sources where the information can increase knowledge so that it will affect individual attitudes. This study will encourage people to prevent HPV infection and implement vaccination programs. To achieve this, it is recommended that HPV vaccine providers be approached, education related to HPV infection and vaccines should be increased, and families and community leaders should be approached. Future researchers can also conduct multivariate analysis to examine the relationship of other factors such as age, respondents' educational background, parents' educational background, and information sources to attitudes about HPV infection and vaccines.

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