

The effect of media exposure, health promotion, healthcare support, and knowledge on HPV vaccine intention among women of reproductive age

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ABSTRACT

Human Papillomavirus (HPV) infection poses a significant public health threat due to its strong association with cervical cancer, which remains a leading cause of cancer-related deaths among women globally. Despite the availability of an effective HPV vaccine, vaccination rates continue to be suboptimal in many regions. Understanding the influence of media exposure, health promotion efforts, healthcare support, and knowledge on HPV vaccine intentions is crucial for designing interventions aimed at increasing vaccine acceptance and mitigating HPV-related health risks. This cross-sectional study sought to examine these factors among women aged 20 to 40 in Tegal, Central Java, Indonesia, from July 2023 to January 2024. The study included 605 participants selected through simple random sampling. Data were collected using validated questionnaires to assess media exposure, health service support, HPV vaccine knowledge, and vaccination intentions. Descriptive statistics, chi-square tests, and multivariate logistic regression were applied to analyze the data and determine associations and predictors of vaccination intentions. Media exposure was not found to be significantly correlated with vaccination intention ($p = 0.179$). However, positive experiences with health promotion ($p = 0.014$), strong healthcare support ($p < 0.001$), and good knowledge of HPV ($p < 0.001$) were significantly associated with higher vaccination intentions. Logistic regression analysis identified health promotion (OR = 1.645), knowledge (OR = 3.797), and healthcare support (OR = 2.481) as significant predictors, underscoring their critical role in shaping health-related decisions. This study highlights the importance of health promotion, healthcare support, and increased knowledge in fostering positive attitudes towards HPV vaccination among women. The findings stress the need for targeted interventions aimed at enhancing health education, supporting healthcare providers, and raising public awareness to improve HPV vaccine uptake and ultimately reduce the incidence of cervical cancer.

Keywords:

healthcare support; health promotion; HPV vaccination; media exposure; vaccine intentions.

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INTRODUCTION

The global public health issue of human papillomavirus (HPV) infection is highly prevalent, largely due to its association with cervical cancer, the fourth most common cancer among women worldwide.¹ In 2022, there were approximately 660,000 new cases and 350,000 deaths attributed to cervical cancer globally.² The high incidence of this disease underscores the urgent need for extensive preventive measures, such as the implementation of HPV vaccination programs.³

In Indonesia, this global concern is reflected in alarming statistics, with approximately 102.5 million women aged 15 and older at risk for cervical cancer. Each year, an estimated 36,633 new cases are diagnosed, and 21,003 deaths occur, making cervical cancer the second most common cancer among women, particularly those aged 15 to 44. Furthermore, an estimated 4.0% of women in Indonesia are believed to be infected with HPV types 16 and 18, which are responsible for 87.0% of invasive cervical cancer cases.⁴ Although vaccines that prevent most HPV-related cervical cancer cases are available, vaccination rates in Indonesia remain below desired levels, particularly among women of reproductive age. One key reason for this low uptake is the fact that the HPV vaccine was not included in the national immunization program until 2016, which delayed earlier vaccination efforts.⁵ While vaccination initiatives since 2016 have focused primarily on school-aged girls, women of reproductive age continue to face the challenge of self-financing the vaccine.^{6,7}

Several factors, including lack of awareness, cultural norms, and existing HPV prevention measures such as regular Pap smears and cervical screenings, affect vaccination rates. Public health campaigns and immunization programs also influence these rates.⁸⁻¹⁰ Recent efforts in Indonesia

to administer the HPV vaccine demonstrate the country's capability to prevent infections caused by the most oncogenic strains of HPV.¹¹ However, the success of these programs largely depends on public support and active participation in immunization efforts.¹² Several studies indicate that women's understanding of the HPV vaccine is inadequate, with an average knowledge score of 16.02 out of 28.^{10,13} Financial barriers and misinformation further contribute to low vaccination rates and high costs.^{14,15}

The decision-making process surrounding HPV vaccination in young women is multifaceted, encompassing factors such as media exposure, promotional experiences, social support, and knowledge levels.^{16,17} HPV is a prevalent virus that can lead to the development of cervical cancer, and vaccination is a highly effective means of preventing this disease. Nevertheless, the implementation of HPV vaccinations remains inconsistent. A deeper understanding of the factors influencing vaccination decisions could help improve vaccine uptake rates.¹⁸

Exposure to HPV-related information positively influences knowledge about HPV and the intention to receive the vaccine. Studies have shown that young women who receive information through various media channels tend to have a greater understanding of HPV and the benefits of vaccination.¹⁶ Additionally, effective promotional and educational campaigns play a key role in raising awareness and understanding of the importance of HPV vaccination.¹⁹ Promotional experiences involving direct contact with healthcare professionals or participation in educational programs in schools and communities can significantly increase the intention to get vaccinated.²⁰

Studies have shown that social media interventions have yielded positive results in raising awareness and improving comprehension of HPV among adolescents

and young adults.²¹ Social media functions as a broad and rapid information platform, enabling efficient dissemination of information.²² However, the challenge lies in translating this heightened awareness into specific behavioral intentions and increased vaccination rates. Effective interventions must address the psychological and social barriers that influence vaccination decisions.²³

Social media posts that invoke fear, especially when accompanied by affirmative comments and likes, have been shown to affect people's behavioral intentions regarding HPV vaccination. Research suggests that messages emphasizing the risks of diseases that HPV vaccines can prevent may enhance individuals' willingness to vaccinate, particularly when strong societal support is present.^{24,25} Studies have also indicated that the number of likes and comments on social media posts significantly impacts the behavioral intentions of young women. A high level of social support, reflected in likes and favorable comments, increases the likelihood of vaccination uptake.²⁶

Researchers have also linked social media advertising to a reduced perceived risk of HPV vaccinations and increased parental support. Perceived risk, or how individuals assess the potential dangers of vaccines, frequently mediates the relationship between social media exposure and parental endorsement. Effective campaigns can mitigate these risk perceptions, thereby increasing parental support for vaccination.^{27,28} Providing evidence that emphasizes the safety and efficacy of vaccinations, coupled with user testimonials, can effectively shift negative perspectives to positive ones. Social support related to healthcare plays a crucial role in shaping vaccination decisions. Young women are more likely to receive vaccinations when they perceive encouragement from their social

environment.²⁹ Engaging in discussions with friends and family members who support vaccination can enhance one's confidence in its effectiveness.

This research underscores the importance of understanding how various factors—such as media exposure, experiences with HPV vaccine promotion, support from healthcare professionals, and knowledge levels—interact in shaping individuals' intentions to receive the HPV vaccine. Media exposure has been shown to play a vital role in raising public awareness about HPV and the benefits of vaccination by providing accurate and easily accessible information, which can reduce doubts and uncertainty. Positive experiences in obtaining information or direct promotion from healthcare professionals significantly contribute to building confidence and increasing compliance with HPV vaccination. Support from healthcare professionals, through the provision of accurate information and direct recommendations, can influence individuals' attitudes and intentions to receive the vaccine. Additionally, a solid understanding of HPV and vaccination can be a determining factor in individual decision-making. This study aims to analyze the associations between exposure to information, health promotion activities, and intentional participation in HPV vaccination to prevent cervical cancer.

METHOD

Study design

The study employs an analytical survey approach with a cross-sectional design to investigate the relationship between specific variables over a defined time period. The research was conducted between July 2023 and January 2024.

Study Setting

This study was carried out in Tegal City and Tegal Regency, located in Central Java Province, Indonesia, due to the low awareness surrounding cervical cancer risks. In 2022, only 1.5% of women of reproductive age in Tegal City and 3.7% in Tegal Regency underwent the IVA test, underscoring the need for increased awareness of cervical cancer prevention through vaccination.³⁰ Tegal City has a population of approximately 280,000 people, while Tegal Regency has a population of around 1,596,996 people (as of 2020). Tegal City was originally part of Tegal Regency but became an independent city in 1986. Situated in the northern part of Tegal Regency, Tegal City serves as a key transportation hub, connecting both provincial and national capitals. Both regions feature culturally homogeneous communities, with the majority of the population being of Javanese origin and using Tegalan Javanese and Indonesian in their daily communication.

Population and sample of the study

The study population consisted exclusively of females aged 20 to 40 who were residents of Tegal City and Regency, situated in the Central Java Province of Indonesia. This age group was selected due to their susceptibility to HPV infection and cervical cancer, as well as their role as decision-makers in family health matters. Notably, this demographic is not included in the national HPV vaccination program.⁵ The researcher calculated the sample size using the A-priori Sample Size Formula for Structural Equation Models, with a power of 80% and a significance level of 0.05.³¹ The calculation yielded a total of 559 participants. To account for potential sample loss, an additional 10% was included, resulting in a final sample size of 605 participants.³² The sampling technique employed was simple random sampling, whereby one participant was systematically selected for an interview from every third household encountered. During each visit,

interviews were conducted with only one woman who met the specified criteria. If no eligible women were present in a household, that residence was excluded from the sample. The inclusion criteria required women aged 20 to 40 who resided in the local area and could to comprehend the questions posed. Exclusion criteria included respondents who voluntarily withdrew from the study before its completion or those who did not fully complete the questionnaire.

Data collection and instruments

Data collection was carried out by four trained research assistants, all of whom were final-year students. Structured training was provided to ensure their preparedness in explaining the study's purpose and distributing the questionnaire effectively. This training aimed to enhance the reliability of the data collection process by equipping all assistants with the necessary knowledge and skills.

The research instrument, developed from relevant literature, consisted of five key sections, each measuring different variables:

1. Demographic Information and Health Promotion Experience: This section collected data on participants' gender, age, educational level, and other personal characteristics. This information was used to contextualize the analysis but did not require a separate validity assessment.

2. Media Exposure to HPV-related Information: Media exposure was measured through 10 questions assessing participants' encounters with content from advertisements, news, and social media. Responses were rated on a 5-point Likert scale, ranging from "never" to "always." The validity of the items in this section was confirmed with a minimum correlation coefficient of 0.306, and the internal consistency reliability was high, with a Cronbach's alpha value of 0.966.

3. Healthcare Support: Participants' experiences with healthcare

professionals providing information about the HPV vaccine were measured through 10 questions. These items evaluated the adequacy of information regarding the vaccine's benefits, risks, and availability. Responses were rated on a 5-point Likert scale. The validity results showed that all items had a correlation coefficient greater than 0.306, while the reliability of this section was demonstrated with a Cronbach's alpha of 0.951.

4. HPV knowledge: HPV knowledge was assessed through 12 questions measuring participants' understanding of cervical cancer, including its causes, risk factors, symptoms, and prevention methods, such as HPV vaccination. The role of Pap smears in prevention was also evaluated. The validity of the questions was confirmed, with each item showing a correlation coefficient exceeding 0.306, and the overall reliability result was 0.859.

5. Vaccination Intention: Vaccination intention was measured using 8 questions evaluating respondents' willingness to receive the HPV vaccine, their confidence in scheduling the vaccination, and their understanding of the vaccination process. The validity of the items was confirmed with correlation coefficients exceeding 0.306. The reliability of this section, as measured by Cronbach's alpha, was 0.852, indicating good internal consistency.

Data analysis

Data collected in this study were analyzed using IBM SPSS Statistics. In addition to descriptive analysis, a chi-square test was conducted with a

significance level of $p < 0.05$ to determine whether there was a significant correlation between the associative and resultant variables. A multivariate logistic regression model was used to evaluate the impact of media exposure and healthcare support on engagement in HPV vaccination. In this modeling method, variables with a significance level of $p < 0.05$ in the bivariate analysis were included. The multivariate model quantified the association as an odds ratio (OR), adjusted and accompanied by a 95% confidence interval for each variable.

Ethical consideration

The Health Research Ethics Committee at Politeknik Kesehatan Kemenkes Semarang, Indonesia, approved the study and issued Certificate Number: 0657/EA/KEPK/2023. The committee granted approval on May 25, 2023.

RESULTS

The study examined the demographic and socioeconomic characteristics of the research participants. The field data obtained from 605 respondents provide a comprehensive and accurate representation of the studied population. The objective of the data analysis is to understand the distribution of respondents' age, educational attainment, place of residence, marital status, employment situation, and income level. As detailed further in Table 1, the results are expected to offer a thorough understanding of the primary attributes of the population.

Table 1. Summary of Respondents' Characteristics (N=605)

Variable	N	%
Age		
< 30 years	438	72.4
≥ 30 years	167	37.6
Education		
Elementary	26	4.3
Secondary	205	33.9
Higher	374	61.8
Residence		
Village	139	37.9
City	436	72.1
Marital Status		
Married	262	43.3
Unmarried	343	56.7
Occupation		
Employed	162	26.8
Student	211	34.9
Civil servant	45	7.4
Housewife	76	12.6
Others	111	18.3
Income level		
≤ Regional minimum wage	304	50.2
> Regional minimum wage	301	49.8

This study presents the demographic characteristics of the participants by analyzing various significant categorical variables. Among the respondents, 72.4% were under the age of 30, and 72.1% resided in urban areas. The majority of participants had attained a higher level of education (61.8%) and were unmarried (56.7%). Regarding employment status, most were either students (34.9%) or

employed professionals (26.7%). The income distribution was nearly even, with approximately 50.2% of respondents reporting earnings below the regional minimum wage.

Further research has established a relationship between demographic and socioeconomic factors and the intention to receive an HPV vaccine, as analyzed in Table 2.

Table 2. Characteristics and Intention Distribution (N=605)

Variable	Intention				χ^2	p-value
	Low		High			
	N	%	N	%		
Age						
< 30 years	106	24.2	332	75.8	7.838	0.005*
≥ 30 years	23	13.8	144	86.2		
Education					2.224	0.329
Elementary	8	30.8	18	69.2		
Secondary	47	22.9	158	77.1		
Higher	74	19.8	300	80.2		

Variable	Intention				χ^2	p-value
	Low		High			
	N	%	N	%		
Residence						
Village	95	21.8	341	78.2	0.044	0.278
City	34	20.1	135	79.9		
Marital Status						
Married	41	15.6	255	74.3	8.867	0.003*
Unmarried	88	25.7	221	84.4		
Occupation						
Employed	29	17.9	133	82.1	5.540	0.236
Student	47	22.3	164	77.7		
Civil servant	10	22.2	35	77.8		
Housewife	12	15.8	64	84.2		
Others	31	27.9	80	72.1		
Income level						
≤ Regional minimum wage	81	26.6	223	73.4	10.318	0.001*
> Regional minimum wage	48	15.9	253	84.1		

Table 2 categorizes the relationship between different demographic and socio-economic factors and respondent intentions into two groups: low intentions and high intentions. Individuals under the age of 30 exhibited a significant inclination (75.8%), while those aged 30 and above demonstrated even higher intentions (86.2%). A chi-square analysis revealed a statistically significant relationship between age and intentions ($p = 0.005$). However, there was no statistically significant relationship between educational attainment and intention ($p = 0.329$), although a large majority of respondents with higher education expressed strong intentions (80.2%). There was a significant relationship between marital status and intention ($p = 0.003$), with unmarried respondents showing a higher intention rate of 84.4%. The relationship between employment type and

intentions was not statistically significant ($p = 0.236$), however, a majority of students (77.7%) and employed individuals (82.1%) demonstrated high intentions. There was a significant relationship between income levels and intent ($p < 0.001$), with respondents earning above the regional minimum wage being more likely to express high intentions (84.1%). These findings indicate that age, marital status, and income level have a strong relationship with respondents' intentions, while educational attainment, place of residence, and employment type show no significant relationship.

Table 3 presents a bi-variable test that examines the relationship between media exposure, experience of receiving health promotion, healthcare support, knowledge, and the intention to receive an HPV vaccine.

Table 3. Bivariate Analysis of HPV Vaccine Intention (N=605)

Variables	Intention				χ^2	p-value	OR (95% CI)
	Low		High				
	N	%	N	%			
Media Exposure							
Low	79	23.3	260	76.7	1.805	0.179	1.313 (0.882-1.950)
High	50	18.8	216	81.2			
Experience Receiving Health Promotion							
Never	82	25.1	245	74.9	5.979	0.014*	1.645 (1.101-2.457)
Ever	47	16.9	231	51.5			
Healthcare Worker Support							
Low	40	35.4	73	64.6	16.411	<0.001*	2.481 (1.581-3.886)
High	89	18.1	403	81.9			
Knowledge							
Low	34	45.3	41	54.7	29.422	<0.001*	3.797 (2.290-6.298)
High	95	17.9	435	82.1			

According to Table 3, the study investigates the relationship between respondent intentions and factors such as media exposure, health promotion experience, healthcare support, and knowledge. The analysis reveals a strong relationship between the acquisition of experience in health promotion ($p = 0.014$, $OR = 1.645$), healthcare support ($p < 0.001$, $OR = 2.481$), and knowledge ($p < 0.001$, $OR = 3.797$) and intention. The results indicate that favorable attitudes towards health promotion, robust healthcare assistance, and high levels of knowledge can enhance individuals' motivation to adopt desired health behaviors.

Following a bi-variable analysis, the study found that factors such as media exposure, experience with health promotion, and level of understanding were strongly linked with the intention to receive the HPV vaccine. The findings of the logistic regression analysis, as presented in Table 4, indicate that out of the seven

independent factors evaluated, only health promotion, knowledge, and healthcare support had a statistically significant impact on the dependent variable. The regression coefficient for health promotion is 0.469, with a p-value of 0.032, suggesting that health promotion has a significant positive effect on the likelihood of a specific outcome, increasing it by 59.8%. The regression analysis indicates that knowledge has a regression factor of 1.228, with a p-value of <0.001 , suggesting that an increase in knowledge is associated with more than three times the likelihood of a specific result. However, age, place of residence, marital status, and display do not have a significant impact on the dependent variables, with p-values of 0.641, 0.374, 0.187, and 0.992, respectively. The model constant has a regression coefficient of -3.968, accompanied by a p-value of <0.001 . This implies that setting all independent variables to zero significantly reduces the likelihood of a specific outcome.

Table 4. Multivariate Analysis of HPV Vaccination Intention (N=605)

Variables	B	S.E.	Wald	p-value	OR (95% CI)
Age	0.157	0.336	0.217	0.641	1.169 (0.613, 2.229)
Residence	0.213	0.239	0.789	0.374	1.237 (0.764, 2.005)
Marital Status	0.374	0.283	1.744	0.187	1.453 (0.837, 2.523)
Media Exposure	0.002	0.220	0.000	0.922	1.002 (0.646, 1.554)
Health Promotion	0.469	0.218	4.615	0.032*	1.598 (1.044, 2.448)
Healthcare Worker Support	0.767	0.243	9.984	0.002*	2.153 (1.343, 3.451)
Knowledge	1.228	0.272	20.451	<0.001*	3.416 (2.032, 5.742)
Constant	-3.968	0.834	22.617	<0.001*	0.019 (0.004, 0.093)
Step 0					
Constant	1.306	0.099	173.008	<0.001*	3.690 (1.076, 1.586)
Model Summary					
-2 Log Likelihood	578.987				
Cox & Snell R ²	0.076				
Nagelkerke R ²	0.118				

DISCUSSION

The study investigates the intention to undergo HPV vaccination based on respondents' demographic characteristics, revealing significant findings and important implications for public health policy. Age is a significant factor in the decision to vaccinate against HPV. This finding aligns with several previous studies, indicating that respondents under the age of 30 tend to exhibit higher vaccination intentions compared to those 30 years of age or older.^{16,33} This is associated with greater awareness and perceived susceptibility to HPV-related diseases among the younger population.³⁴ The findings highlight the importance of understanding how perceptions of HPV vaccination can vary depending on the age range.

Education, while not exhibiting substantial disparities in this research, generally demonstrates a positive correlation with enhanced health literacy.^{35,36} However, a greater understanding of health, often associated with higher levels of education, can influence the general acceptance of

vaccinations. Marital status is another factor that affects the intention to get vaccinated against HPV. Compared to married individuals, unmarried individuals often display higher vaccination intentions.^{37,38} Possible contributing factors include increased healthcare expenses for unmarried individuals and variations in the availability of vaccination services. Although factors such as employment, residential location, and income levels did not significantly impact the intention to receive HPV vaccination in this study,^{39,40} other research supports the idea that sufficient access to healthcare services and accurate information is critical for increasing vaccination acceptance among various population groups.^{41,42}

The results of the study indicate no significant correlation between the intention to vaccinate and the level of exposure to information regarding HPV vaccinations, which contradicts other studies showing that exposure to information positively affects vaccination intention. Wang et al. found that increased exposure to HPV-related information in young women in China significantly raised

their knowledge and intention to vaccinate.¹⁶ Similarly, Ota et al. discovered that a LINE-based information intervention effectively increased vaccination intention among Japanese university students.⁴³

Although the lack of significance is evident, there is a tendency to associate greater exposure to information with a higher likelihood of intending to receive the HPV vaccine. Inconsistent information regarding HPV vaccines can cause confusion and indecision, resulting in reduced willingness to vaccinate.⁴⁴ Furthermore, social media significantly influences perceptions, as messages containing more negative consequences and statistical data can amplify perceived risks and the seriousness of side effects, potentially leading to regrettable choices.^{45,46} Parents' exposure to information regarding HPV vaccination on social media also influences their decisions; exposure to pro-vaccine information increases the likelihood of initiating immunization, whereas exposure to anti-vaccination information is linked to delays or refusal of immunizations.⁴⁷ Furthermore, utilizing a diverse range of instructional resources, such as written materials and films, can greatly enhance the uptake of the HPV vaccine and alleviate apprehensions surrounding vaccination.⁴⁸

The research findings further indicate that health promotion programs have a significant positive correlation with the intention to receive HPV vaccinations. This aligns with the program implemented in Reunion Island, where the dissemination of information and provision of free vaccinations in schools increased vaccination coverage among high school students. Health promotion can be utilized to encourage vaccination intentions and actions, demonstrating that enhancing knowledge and access to information about HPV can improve participation in vaccination efforts.⁴⁹

Individuals who have participated in health promotion initiatives demonstrate

higher levels of intention to receive the HPV vaccination compared to those who have not. The finding that individuals who have undergone health promotion are more likely to intend to receive HPV vaccination aligns with earlier research that highlights the strong impact of targeted health promotion interventions on vaccination behavior. Multiple studies provide evidence that health promotion efforts positively influence individuals' intentions to receive the HPV vaccine.^{21,50} Additional studies show that health promotion initiatives significantly influence behavior, leading to an increase in vaccination intentions.⁵¹ Scientists have identified specific health promotion strategies, such as implementing regulations at the regional level, creating a supportive environment, and empowering communities through education and partnerships, as successful approaches to improving vaccination rates.^{52,53} These findings emphasize the importance of tailored health promotion strategies in influencing individuals' intentions and behaviors toward vaccination and underscore the effectiveness of focused public health efforts, including HPV vaccination.^{51,54}

The characteristics of health support also show a substantial correlation with the intention to vaccinate against HPV. Evidence suggests that health support, including recommendations from healthcare professionals, has a significant impact on individuals' likelihood of receiving the HPV vaccine. Previous research corroborates this finding, indicating that recommendations from healthcare providers significantly influence vaccine decisions.^{55,56} Health professionals with specialized knowledge of HPV, particularly those working in specialized departments such as obstetrics or gynecology, are more likely to recommend vaccination more frequently. Healthcare workers can help address challenges to vaccination by implementing evidence-based interventions at the health system

level, thereby increasing vaccination rates.^{57,58} Health practitioners can improve vaccination intentions by providing precise and persuasive information about the HPV vaccine's safety and advantages, thereby changing negative opinions.⁵⁹

The respondents' level of knowledge about the HPV vaccine significantly influences their intention to receive it. Individuals with a more comprehensive understanding of the HPV vaccine generally show a greater inclination to get vaccinated compared to those with less knowledge. Numerous studies confirm that an individual's awareness of the HPV vaccine strongly affects their intention to receive it. For instance, research among male students in China found that exposure to positive information enhances their understanding of HPV, thereby boosting their confidence and willingness to advocate for vaccination.⁶⁰ Similarly, a study conducted in the United States revealed that older parents with more extensive knowledge of HPV vaccination are better prepared to ensure their adolescent children receive the vaccine.³³ Another study in China found that exposure to positive information about HPV impacts individuals' understanding of the virus and their willingness to be vaccinated.⁶¹ These findings underscore the importance of comprehensive knowledge about the advantages and safety of HPV vaccines, which positively influence individuals' decisions to get vaccinated. This highlights the need for educational and awareness initiatives to promote the acceptance of HPV vaccination.

The strengths of this study include a comprehensive analysis of the factors influencing HPV vaccination intention. The research effectively demonstrates that positive health promotion experiences and healthcare support significantly impact vaccination intention, while media exposure does not show a similar

relationship. This suggests that interpersonal aspects and social support play a more critical role in shaping positive attitudes toward vaccination than information conveyed solely through media. The findings offer practical recommendations for healthcare professionals and policymakers, such as enhancing communication skills to effectively convey information to patients and developing more inclusive and engaging public education campaigns. Furthermore, the study links its findings to broader public health objectives, highlighting its relevance in reducing cervical cancer incidence and improving overall health outcomes, while emphasizing the importance of a holistic approach to health promotion. It also opens avenues for further research on effective health promotion strategies and their impact on vaccination behavior among women of reproductive age, contributing to the development of improved health policies in the future.

However, the study has significant limitations. The use of a cross-sectional design provides only a static snapshot of attitudes and behaviors related to HPV vaccination at a single point in time, limiting the ability to assess changes over time. Consequently, it is recommended that future researchers conduct longitudinal studies to examine the evolution of attitudes and behaviors concerning HPV vaccination over extended periods. Additionally, while the study successfully identifies correlations between variables, the cross-sectional approach does not allow for the establishment of clear causal relationships. As such, intervention or experimental studies are needed to evaluate the effects of specific interventions aimed at enhancing HPV vaccination intentions among diverse populations. This approach is expected to provide deeper insights into the factors influencing vaccination and strategies to

increase community participation in vaccination programs.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that while media exposure does not significantly correlate with intentions to acquire HPV vaccination, positive health promotion experiences, robust health support, and high awareness of HPV significantly enhance the desire for vaccination. Health promotion, information, and support are crucial determinants of vaccination intent, underscoring their importance in shaping health choices. The findings underscore the need for enhanced health promotion initiatives to raise awareness about the HPV vaccine, with healthcare professionals playing a crucial role in disseminating information and providing support. Specific training to improve communication skills is recommended, alongside the development of inclusive public education campaigns that utilize various media platforms, particularly social media, to reach diverse audiences. Furthermore, integrating HPV vaccination awareness into broader health strategies and allocating resources for the training of healthcare professionals are essential. Policymakers should promote partnerships with educational institutions and community organizations to ensure the dissemination of accessible and accurate information about HPV and vaccination. Ultimately, increasing public awareness and access to HPV vaccination can significantly reduce cervical cancer incidence and improve overall public health outcomes.

REFERENCES

1. WHO. Human Papillomavirus (HPV) and Cervical Cancer. 2023. [Internet]. [Cited 2024 June 11]. Available from: [https://www.who.int/news-room/fact-](https://www.who.int/news-room/fact-sheets/detail/human-papillomavirus-(hpv)-and-cervical-cancer)
2. WHO. Cervical cancer. 2024. [Internet]. [Cited 2024 June 19]. Available from: <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>
3. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem, World Health Organization. 2020. [Cited 2024 June 12]. Available from: <https://www.who.int/publications/i/item/9789240014107>
4. Information Centre on HPV and Cancer (ICO/IARC). Indonesia Human Papillomavirus and Related Cancers, Fact Sheet 2023, ICO/IARC Inf Cent HPV Cancer. 2023. [Cited 2024 June 10]. Available from: https://hpvcentre.net/statistics/reports/IDN_FS.pdf
5. Khatiwada M, Kartasasmita C, Mediani HS, Delprat C, Van Hal G, Dochez C. Knowledge, Attitude and Acceptability of the Human Papilloma Virus Vaccine and Vaccination Among University Students in Indonesia. *Front Public Heal*. 2021;9:616456.
6. Winarto H, Habiburrahman M, Dorothea M, Wijaya A, Nuryanto KH, Kusuma F, et al. Knowledge, attitudes, and practices among Indonesian urban communities regarding HPV infection, cervical cancer, and HPV vaccination. *PLoS One*. 2022;17:1–29. doi: 10.1371/journal.pone.0266139
7. Setiawan D, Andrijono, Hadinegoro SR, Meyta H, Sitohang RV, Tandy G, et al. Cervical cancer prevention in Indonesia: An updated clinical impact, cost-effectiveness and budget impact analysis. *PLoS One*. 2020;15(3): e0230359. doi: 10.1371/journal.pone.0230359
8. Egbon M, Ojo T, Aliyu A, Bagudu ZS. Challenges and lessons from a school-based human papillomavirus (HPV) vaccination program for adolescent

- girls in a rural Nigerian community. *BMC Public Health*. 2022;22(1):4–11. doi: 10.1186/s12889-022-13975-3
9. Isaacson S, Adewumi K, Smith JS, Novak C, Oketch S, Huchko MJ. A Qualitative Exploration of Barriers to Treatment Among HPV-Positive Women in a Cervical Cancer Screening Study in Western Kenya. *Oncologist*. 2023;28(1):e9–18.
 10. Kistiana S, Fajarningtiyas DN, Lukman S. Differentials in Reproductive Health Knowledge among Adolescents in Indonesia. *Media Kesehatan Masyarakat Indones*. 2023;19(1):19–29.
 11. Li Y. Human papillomavirus infection and cervical cancer prevention in Indonesia. *Proc. SPIE 12611, Second International Conference on Biological Engineering and Medical Science (ICBioMed 2022)*. 2023;126112B. doi: 10.1117/12.2670404
 12. Hidayat YM, Reynaldi GN. 9vHPV (Nonavalent) Vaccine Policy in Indonesia. *Indones J Obstet Gynecol*. 2023;11(2):61–3.
 13. Mutiar A, Wulandari T, Nurhayati N, Marfuah D, Noor Hayati S. Knowledge-related Human Papillomavirus Vaccination: A Study of Indonesian Women. *J Keperawatan Komprehensif Compr Nurs J*. 2023; 9(1):60-66.
 14. Setiawan D, Postma MJ, Wilffert B, Off Page. HPV vaccination in Indonesia : a health-economic & comparative perspective. [Groningen]: University of Groningen, 2017.
 15. Handayani S, Dewi RM, Wibowo HA, Dany F, Kipuw NL, Adelina R, et al. Cervical Cancer Risk Factor: HPV Infection Among Indonesian Urban Women. *Advances in Health Sciences Research, 4th International Symposium on Health Research (ISHR 2019)*. 2020;22:452–5.
 16. Wang Y, Chen Y, Bao S. The impact of exposure to HPV related information and injunctive norms on young women's intentions to receive the HPV vaccine in China: A structural equation model based on KAP theory. *Front Public Health*. 2023;10:1102590. doi: 10.3389/fpubh.2022.1102590
 17. Zhang L, Yang J, Cao Y, Kang W. Sociocultural–psychological predictors influencing parents’ decision-making regarding HPV vaccination for their adolescent daughters in mainland China: An extended TPB model. *Front Public Heal*. 2023;10:1035658. doi: 10.3389/fpubh.2022.1035658
 18. Guillaume D, Waheed D e. N, Schlieff M, Muralidharan K, Vorsters A, Limaye R. Key decision-making factors for human papillomavirus (HPV) vaccine program introduction in low-and-middle-income-countries: Global and national stakeholder perspectives. *Hum Vaccin Immunother*. 2022;18(7): 2150454. doi: 10.1080/21645515.2022. 2150454
 19. Oketch SY, Ochomo EO, Orwa JA, Mayieka LM, Abdullahi LH. Communication strategies to improve human papillomavirus (HPV) immunisation uptake among adolescents in sub-Saharan Africa: A systematic review and meta-analysis. *BMJ Open*. 2023;13(4):e067164. doi: 10.1136/bmjopen-2022-067164
 20. Krokidi E, Rao AP, Ambrosino E, Thomas PPM. The impact of health education interventions on HPV vaccination uptake, awareness, and acceptance among people under 30 years old in India: a literature review with systematic search. *Front Reprod Heal*. 2023;5:1151179. doi: 10.3389/frph.2023.1151179
 21. Escoffery C, Petagna C, Agnone C, Perez S, Saber LB, Ryan G, et al. A systematic review of interventions to promote HPV vaccination globally.

- BMC Public Health. 2023;23(1):1262. doi: 10.1186/s12889-023-15876-5.
22. Jorge V, Cheng-Chia C. Impact of social media messages on perceived risk and severity of adverse effects and regret of HPV vaccination: The moderating role of decision-making preference. *J Clin Oncol*. 2023; 10(16_suppl):10543–10543.
 23. Wong C, Wang R, Xu X, Zhao Y. Exploring an Impact of Digital Media Platform on HPV Vaccination Intentions of College Women. *ducation Psychol Public Media*. 2023;2(1):316–24.
 24. Thompson EL, Preston SM, Francis JKR, Rodriguez SA, Pruitt SL, Blackwell JM, et al. Social Media Perceptions and Internet Verification Skills Associated with Human Papillomavirus Vaccine Decision-Making among Parents of Children and Adolescents: Cross-sectional Survey. *JMIR Pediatr Parent*. 2022;5(3): e38297. doi: 10.2196/38297
 25. Olga M. Influence of fear on anti-vaccine conspiracy theories and behaviour against vaccination. *Rev Psicol la salud*. 2023;11(1):179–92.
 26. Igartua JJ, Rodríguez-Contreras L, Guerrero-Martín Í, Honorato-Vicente A. “It Happened to Me and It’s Serious”: Conditional Indirect Effects of Infection Severity Narrated in Testimonial Tweets on COVID-19 Prevention. *Int J Environ Res Public Health*. 2023;20(13):6254. doi: 10.3390/ijerph20136254
 27. Ramgopal G, Bhartendra S. Cervical cancer and human papilloma virus vaccination: gap and barriers. *Int J Community Med Public Heal*. 2022;10(1):511–4.
 28. Constable C, Ferguson K, Nicholson J, Quinn GP. Clinician communication strategies associated with increased uptake of the human papillomavirus (HPV) vaccine: A systematic review. *CA Cancer J Clin*. 2022;72(6):561–9.
 29. de Araújo TM, Souza FO, Pinho PS, Werneck GL. Beliefs and Sociodemographic and Occupational Factors Associated with Vaccine Hesitancy among Health Workers. *Vaccines (Basel)*. 2022;10(12):2013. doi: 10.3390/vaccines10122013
 30. Dinkes Jawa Tengah. Profil Kesehatan Jawa Tengah, Jawa Tengah 2022. Dinas Kesehatan Pemerintahan. 2023.
 31. Jobst LJ, Bader M, Moshagen M. A tutorial on assessing statistical power and determining sample size for structural equation models. *Psychol Methods*. 2021;28(1):207–21. doi: 10.1037/met0000423
 32. Jhantasana C. Should A Rule of Thumb be used to Calculate PLS-SEM Sample Size. *Asia Soc Issues*. 2023;16(5): e254658.
 33. Zhu X, Jacobson RM, MacLaughlin KL, Sauver JS, Griffin JM, Finney Rutten LJ. Parent-reported Barriers and Parental Beliefs Associated with Intentions to Obtain HPV Vaccination for Children in a Primary care Patient Population in Minnesota, USA. *J Community Health*. 2023;48(4):678–86. doi: 10.1007/s10900-023-01205-9
 34. Luo Y, Liu T, Yang X, Lu M, Kou Z, Xu X. Human papillomavirus vaccination and contributing factors of vaccination intention among adolescents and young adults in China from a socio-ecological perspective: A cross-sectional study. *Public Health Nurs*. 2024;41(3):602–16. doi: 10.1111/phn.13315
 35. Son Y, Ahn O. Factors Associated with Intention to Receive HPV Vaccination among Marriage-Immigrant Women. *J Korea Acad Ind Coop Soc*. 2021; 22(5):465–74.
 36. Braveman P. Education Shapes Health and Health Disparities in Many Ways. In: *The Social Determinants of Health and Health Disparities*. New York: Oxford Academic. 2023.
 37. Hardin RN, Russell KM, Flynn JS,

- Gammel HL, Eddinger JR, Schenck LA, et al. Factors Associated with Intention of Human Papillomavirus (HPV) Vaccine Initiation Among Females With and Without a History of Childhood Cancer. *J Clin Psychol Med Settings*. 2020;27(4):716-726. doi: 10.1007/s10880-019-09664-w
38. Le XTT, Nguyen PTN, Do TTT, Nguyen TH, Le HT, Nguyen CT, et al. Intention to pay for hpv vaccination among women of childbearing age in vietnam. *Int J Environ Res Public Health*. 2020;17(9):3144. doi: 10.3390/ijerph17093144
39. Mansfield LN, Onsomu EO, Merwin E, Hall NM, Harper-Harrison A. Association Between Parental HPV Knowledge and Intentions to Have Their Daughters Vaccinated. *West J Nurs Res*. 2018;40(4):481-501. doi: 10.1177/0193945916682953
40. Ratanasiripong NT, Sri-Umporn S, Kathalae D, Hanklang S, Ratanasiripong P. Human papillomavirus (HPV) vaccination and factors related to intention to obtain the vaccine among young college women in Thailand. *J Heal Res*. 2018; 32(2):142–51.
41. Otojareri KA, Isah M, Pius OO, Aliyu KM, Isah ZM, Shekwolo ZN. Effect of Access to Immunization Information on Vaccine Acceptance amongst Parents/Caregivers Visiting Health Facilities in Wushishi Local Government Area, Niger State. *Texila Int J Public Heal*. 2023;11(1):1–10.
42. Rubin J. Communication is key to sustainable vaccination programs. *Acta Paediatr Int J Paediatr*. 2023; 112(9):1838–9. doi: 10.1111/apa.16888
43. Ota Y, Nomura K, Fujita N, Suzuki T, Kamatsuka M, Sakata N, et al. Influence of LINE-Assisted Provision of Information about Human Papillomavirus and Cervical Cancer Prevention on HPV Vaccine Intention: A Randomized Controlled Trial. *Vaccines*. 2022;10(12):2005. doi: 10.3390/vaccines10122005
44. Villegas J, Chen C-C (Brian), Lee MJ. Impact of social media messages on perceived risk and severity of adverse effects and regret of HPV vaccination: The moderating role of decision-making preference. *J Clin Oncol*. 2023;41(16_suppl):10543–10543.
45. Hong SJ, Kim Y. Relationship of Exposure to Contradictory Information and Information Insufficiency to Decision-Making About HPV Vaccination Among South Korean College Women. *J Health Commun*. 2023;28(3):156–67. doi: 10.1080/10810730.2023.2191224
46. Passos MZ, da Silva-Filho AL, Brandão WC, Meinberg MF, Werneck RA. Evaluating the quality of HPV vaccine-related information on the Portuguese Internet. *Hum Vaccines Immunother*. 2022;18(6):2104571. doi: 10.1080/21645515.2022.2104571
47. Llavona-Ortiz JY, Spanos KE, Kraschnewski JL, D’Souza G, Myrick JG, Sznajder KK, et al. Associations Between Human Papillomavirus Vaccine Decisions and Exposure to Vaccine Information in Social Media. *Cancer Control*. 2022;29:10732748 221138404. doi: 10.1177/1073274822 1138404
48. Ekmez F, Ekmez M. Effects of information sources in HPV vaccine acceptance: prospective randomized trial. *Postgrad Med*. 2022;134(8):829–33. doi: 10.1080/00325481.2022. 2124791
49. Tran PL, Chirpaz E, Boukerrou M, Bertolotti A. PROM SSCOL-Impact of a Papillomavirus Vaccination Promotion Program in Middle Schools to Raise the Vaccinal Coverage on Reunion Island. *Vaccines*. 2022;10(11):

1923. doi: 10.3390/vaccines10111923
50. Yi Y, Xiu S, Shi N, Huang Y, Zhang S, Wang Q, et al. Perceptions and acceptability of HPV vaccination among parents of female adolescents 9–14 in China: A cross-sectional survey based on the theory of planned behavior. *Hum Vaccin Immunother.* 2023;19(2):2225994. doi: 10.1080/21645515.2023.2225994
51. Silvia S, Jason W, Beckstead. M, Naveed K, Ellen M, Daley D, et al. An approach to targeted promotion of HPV vaccination based on parental preferences for social media content. *J Soc Mark.* 2023;13(3):341–60.
52. Marshall S, Moore AC, Fleming A, Sahm LJ. A Video-Based Behavioral Intervention Associated with Improved HPV Knowledge and Intention to Vaccinate. *Vaccines (Basel).* 2022; 10(4):562. doi: 10.3390/vaccines10040562
53. Bradley-Ewing A, Lee BR, Doctor JN, Meredith G, Goggin K, Myers A. A pilot intervention combining assessment and feedback with communication training and behavioral nudges to increase HPV vaccine uptake. *Hum Vaccin Immunother.* 2021;18(1):1885968. doi: 10.1080/21645515.2021.1885968
54. Hecht ML, BeLue R, Ray A, Hopfer S, Miller-Day M, Mckee F. HPV Vaccine Intent among Adult Women Receiving Care at Community Health Centers. *J Cancer Educ.* 2022;37(4):1186-1193. doi: 10.1007/s13187-020-01937-5
55. Balogun FM, Omotade OO. Facilitators and barriers of healthcare workers' recommendation of HPV vaccine for adolescents in Nigeria: views through the lens of theoretical domains framework. *BMC Health Serv Res.* 2022;22(1):824. doi: 10.1186/s12913-022-08224-7
56. Silverthorne C, Daniels J, Thompson M, Robson JC, Ndosu M, Swales C, et al. Health professionals' perspectives on psychological distress and meeting patients' support needs in rheumatology care settings: A qualitative study. *Musculoskeletal Care.* 2023;21(2):537–44. doi: 10.1002/msc.1730
57. Laudi A. Identifying the Roles of Medical Providers when Addressing Barriers to HPV Vaccination Rates in Rural NE Clinics. *J Obstet Gynecol Reprod Sci.* 2022;6(1):01–7.
58. Horn S, Chapman GB, Chouhan K. Doctor recommendations and parents' HPV vaccination intentions in Kenya: A randomized survey. *Prev Med reports.* 2022;25:101659. doi: 10.1016/j.pmedr.2021.101659
59. Tsui J, Vincent A, Anuforo B, Btoush R, Crabtree BF. Understanding primary care physician perspectives on recommending HPV vaccination and addressing vaccine hesitancy. *Hum Vaccin Immunother.* 2021;17(7):1961–7. doi: 10.1080/21645515.2020.1854603
60. Wu H, Tong X, Wang L, Huang Y, Zhang L. HPV vaccine information, knowledge, attitude, and recommendation intention among male college students in China. *Hum Vaccines Immunother.* 2023;19(2):2228163. doi: 10.1080/21645515.2023.2228163
61. Jin SW, Lee Y, Brandt HM. Human Papillomavirus (HPV) Vaccination Knowledge, Beliefs, and Hesitancy Associated with Stages of Parental Readiness for Adolescent HPV Vaccination: Implications for HPV Vaccination Promotion. *Trop Med Infect Dis.* 2023;8(5):251. doi: 10.3390/tropicalmed8050251