

Understanding HPV Awareness and Vaccine Acceptance: A Descriptive Study among Female Students

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Abstract

Human Papillomavirus (HPV) is a prevalent double-stranded DNA virus that affects approximately 50% of both men and women. With over 200 types, 12 of which are classified as high-risk and linked to cancers in areas such as the cervix and anogenital regions, HPV poses a significant health threat. Treatment options include laser therapy, cryotherapy, and vaccination, which is recommended by the World Health Organization for girls aged 9 to 14. However, awareness and acceptance of the HPV vaccine among the Iranian population, particularly among female students, are low. This underscores the need for a systematic review and meta-analysis of vaccine acceptance among adolescents. The aim of this study is to evaluate the awareness of female students regarding HPV and their acceptance of the vaccine, which is crucial in addressing the prevalence of this virus and its associated health risks. This descriptive-applied study was conducted with 361 female students from the Islamic Azad University of Sari Medical School. Data were collected using a questionnaire and a checklist designed by the researchers. The study aimed to assess the students' awareness and knowledge about HPV and its vaccine using reliable and valid tools. The study included 361 female students from various fields of study and educational levels at the Islamic Azad University of Sari. Of the participants, 94.7% were single, and 11.9% had received the HPV vaccine. Awareness of HPV varied significantly based on factors such as age, field of study, and educational level. Medical and nursing students, those over 25 years old, and third- and fourth-year students demonstrated higher awareness. No significant differences were noted in awareness or attitudes between single and married individuals. Vaccine acceptance was higher among students in medical and paramedical fields, and acceptance rates improved with advancing academic years and increasing age. The study concluded that awareness and acceptance of the HPV vaccine among students were influenced by various factors, including field of study, age group, and academic year, but not by marital status. While awareness of HPV and its vaccine among female students appears adequate, the vaccination coverage rate remains low. The study reveals that awareness and acceptance of the HPV vaccine among female students at the Islamic Azad University of Sari are influenced by field of study, age group, and academic year, but not by marital status. Although awareness about HPV and its vaccine seems sufficient, the low vaccination coverage rate highlights the urgent need for educational and intervention measures to enhance awareness and acceptance of HPV vaccination among students.

Key words: HPV, awareness, attitude, acceptance, HPV vaccine.

Introduction

Human Papillomavirus (HPV) is a double-stranded DNA virus and one of the most common sexually transmitted infections, affecting approximately 50% of both

How to cite this article: Najibeh Firouzgan, Melody Omraninava, Farnaz Firouzinezhad, Monirolsadate Hoseseini Tabaghdehi. Understanding HPV Awareness and Vaccine Acceptance: A Descriptive Study among Female Students. Pegem Journal of Education and Instruction, Vol. 15, No. 1, 2025, 439-448

Source of support: Nil **Conflicts of**

Interest: None. **DOI:**

10.48047/pegagog.15.01.35

Received: 12.11.2024 **Accepted:**

15.12.2024 **Published:** 01.01.2025

with 12 classified as high-risk. Low-risk types cause warts, while high-risk types can lead to precancerous lesions and cancers in the cervix, vagina, vulva, penis, scrotum, anus, and oropharyngeal regions[3-6]. HPV spreads through contact with damaged skin and mucous membranes, with risk factors including smoking, alcohol use, unsafe sex, depression, and immune deficiencies[2, 7-9]. HPV vaccines (bivalent, quadrivalent, and nonvalent) effectively prevent warts and cancerous lesions. Healthcare professionals advocate for vaccination against human papillomavirus (HPV) for all individuals within the age range of 9 to 26 years[8, 10, 11]. The WHO recommends vaccination for girls aged 9–14, aiming for 90% coverage by 2030 to eliminate cervical cancer[12]. However, vaccine hesitancy remains a challenge, driven by misconceptions about its necessity. Awareness, trust, and involvement in decision-making positively influence acceptance, yet misinformation leads to reluctance[13, 14]. In Iran, research suggests low awareness of HPV and its vaccine, which impacts immunization success. The success of any immunization program is closely tied to the foundational knowledge and beliefs about the disease. In an academic setting, given the presence of students from various regions of the country with different cultural backgrounds, awareness and acceptance levels of the HPV vaccine can significantly contribute to preventive planning within healthcare systems. University students, as a diverse and influential group, play a key role in

shaping public health outcomes[15]. Despite this, no systematic review has summarized HPV vaccine acceptance among adolescents, highlighting the need for further research and targeted interventions.

Methodology:

Design and Method

This study is a descriptive-applied investigation conducted among female medical college students at Islamic Azad University of Sari. The target sample size was determined to be 385 participants, calculated using Cochran's formula. To ensure representativeness, a combination of probabilistic sampling methods—including random, convenience, and stratified sampling—was employed. Ethical approval for the study was obtained from the relevant institutional review board, with the ethics identification number IR.IAU.SARI.REC.1402.291. Prior to participation, all students provided informed consent, ensuring adherence to ethical research standards.

Data collection was carried out using a researcher-designed questionnaire and checklist. The questionnaire, developed specifically for this study, consisted of two main sections: Demographic Information and HPV Awareness and Knowledge Assessment. The latter was divided into three subsections: Awareness of HPV Infection, Detailed Knowledge about HPV, and Knowledge about HPV Vaccines. Additionally, participants were asked whether they had received the HPV vaccine. Each correct response was assigned one point, while incorrect responses received zero points. A

composite score (ranging from 0 to 100) was then calculated, with a score of 60% or higher considered indicative of adequate awareness and knowledge. Furthermore, an 11-item HPV Attitude Questionnaire was administered, utilizing a 6-point Likert scale (ranging from "completely agree" to "completely disagree") to assess participants' attitudes toward HPV-related topics.

Validity and Reliability

Expert faculty members assessed the questionnaire, resulting in a Content Validity Ratio (CVR) for each item ranging from 0.78 to 1.0 (with an overall CVR of 0.89) and a Content Validity Index (CVI) between 0.77 and 0.92. The questionnaire's reliability was measured using the Kuder-Richardson 20 coefficient in a pilot study ($n = 25$), yielding an overall $\alpha = 0.67$. The subscales for awareness and knowledge showed reliability coefficients of 0.7 and 0.74, respectively.

Data Analysis

Data were analyzed using SPSS version 22. Frequency distributions, means, and standard deviations were computed to summarize the demographic characteristics and responses regarding HPV awareness, knowledge, and attitudes. The relationships between variables (e.g., between demographic factors and levels of HPV awareness/knowledge) were examined using Spearman and Pearson correlation tests. Depending on the research questions, other statistical tests (such as t-tests or chi-square tests) might be conducted to identify significant differences between groups or associations

between variables.

Result:

This study included 361 female students from the Islamic Azad University of Sari, each pursuing a unique field of study. The distribution was as follows: 5.5% in psychology, 9.1% in midwifery, 5% in public health, 6.4% in laboratory sciences, 6.1% in operating room technology, 27.7% in nursing, and 40.2% in medicine. The students were divided into four age groups. The age group of 18-20 years made up 27.1% of the participants. The age group of 21-22 years comprised 40.7% of the participants. Additionally, 21.1% of the students were in the age group of 23-25 years, and 11.1% were over 25 years old. The majority (94.7%) were single, and the rest (5.3%) were married. The frequency of participants based on their field of study and academic year is listed in [Table 1](#) and [Table 2](#), respectively. From the total of 361 female students at the Islamic Azad University of Sari, 11.9% had been vaccinated against HPV, while 88.1% had not been vaccinated.

Table 1 Frequency and Percentage of Students
Based on Their Field of Study

Field of Study	Frequency	Percentage
Psychology	20	5.5%
Midwifery	33	9.1%
Public Health	18	5.0%
Laboratory Sciences	23	6.4%
Operating Room Tech	22	6.1%
Nursing	100	27.7%
Medicine	145	40.2%

Table 2 Frequency and Percentage of Participants

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by Academic Year

Academic Year	Frequency	Percentage
First and Second Year	175	48.5%
Third and Fourth Year	41	11.4%
Intern	30	8.3%
Extern	46	12.7%
Physiopathology	39	10.8%
Basic Sciences	30	8.3%

The awareness of Human Papillomavirus (HPV) was evaluated through a set of 15 questions, with participants responding using three options: "Yes," "No," or "Don't Know." [Table3](#) presents the frequency and percentages of the responses for these options.

Table 3Frequency (percentage) of responses given to the HPV awareness questionnaire

Questions	Yes (Frequency/P ercentage)	No (Frequency/P ercentage)	Don't Know (Frequency/Percentage)
1. Have you ever heard of the Human Papillomavirus (HPV)?	350 (97%)	10 (2.8%)	1 (0.3%)
2. Can HPV cause infections in the genital area?	263 (72.9%)	14 (3.9%)	84 (23.3%)
3. Is HPV transmitted through sexual contact?	325 (90%)	6 (1.7%)	30 (8.3%)
4. Does HPV infection have specific symptoms and signs?	269 (74.5%)	39 (10.8%)	53 (14.7%)
5. Are benign skin warts a complication of HPV?	196 (54.3%)	50 (13.9%)	115 (31.9%)
6. Is there a risk of infection in both genders?	322 (92%)	6 (1.7%)	23 (6.4%)
7. Can HPV cause cancer in men?	178 (49.3%)	60 (16.6%)	123 (34.1%)
8. Can HPV be transmitted from mother to fetus?	222 (61.5%)	38 (10.5%)	101 (28%)
9. Is cervical cancer a complication of HPV?	281 (77.8%)	10 (2.8%)	70 (19.4%)
10. Is HPV infection detected by Pap smear test?	249 (69%)	29 (8%)	83 (23%)
11. Should HPV infection be treated immediately?	290 (80.3%)	18 (5%)	53 (14.7%)
12. Is pregnancy a contraindication for the HPV vaccine?	89 (24.7%)	71 (19.7%)	201 (55.6%)
13. Does prevention of HPV infection prevent cervical cancer?	233 (64.5%)	42 (11.6%)	86 (23.8%)
14. Is there a vaccine against HPV?	262 (72.6%)	19 (5.3%)	80 (22.2%)
15. Is vaccination effective in preventing cancer?	293 (81.1%)	16 (4.4%)	52 (14.4%)

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The HPV attitude questionnaire consisted of 11 questions in a 6-point Likert scale format. Participants responded to questions by selecting options ranging from "Strongly Agree" to "Strongly

Disagree". [Table 4](#) shows the frequency (percentage) of responses to the HPV attitude questionnaire.

Table 4Frequency (percentage) of responses to the HPV attitude questionnaire

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Everyone in society needs awareness about HPV and its complications.	325 (90%)	28 (7.8%)	2 (0.6%)	6 (1.7%)	0 (0%)
2. Public education, especially for women, about HPV and its complications is essential.	325 (90%)	36 (10%)	0 (0%)	0 (0%)	0 (0%)
3. Education on HPV transmission methods should be included in reproductive health programs.	317 (87.8%)	40 (11.1%)	2 (0.6%)	2 (0.6%)	0 (0%)
4. Vaccination against HPV should be included in health education programs.	316 (87.5%)	32 (8.9%)	13 (3.6%)	0 (0%)	0 (0%)
5. HPV vaccination should be included in premarital education programs.	312 (86.4%)	35 (9.7%)	12 (3.3%)	2 (0.6%)	0 (0%)
6. Education about HPV should be included in school and university curricula.	304 (84.2%)	41 (11.4%)	13 (3.6%)	3 (0.8%)	0 (0%)
7. Side effects of the vaccine are among the concerns of consumers.	111 (30.7%)	75 (20.8%)	120 (33.2%)	49 (13.6%)	6 (1.7%)
8. Lack of awareness of HPV complications is one of the main reasons for not vaccinating against it.	183 (50.7%)	92 (25.5%)	49 (13.6%)	29 (8%)	2 (0.6%)
9. HPV vaccination should be recommended to all friends and acquaintances.	257 (71.2%)	74 (20.5%)	27 (7.5%)	2 (0.6%)	1 (0.3%)
10. The main decision-maker about HPV vaccination is the individual themselves.	173 (47.9%)	70 (19.4%)	49 (13.6%)	56 (15.5%)	13 (3.6%)
11. If the vaccine is accessible, all women should be vaccinated.	263 (72.9%)	57 (15.8%)	29 (8%)	9 (2.5%)	3 (0.8%)

Before examining the research objectives, the

normality of the data related to students'

awareness and attitudes about HPV was checked using skewness and kurtosis indices. Since these indices were within the range of (-2, 2), the data

did not show significant deviations from normal distribution ([Table 5](#)). Therefore, parametric tests were used to investigate the research objectives.

Table 5 *Descriptive statistics of the students' awareness and attitude questionnaire towards HPV*

Variable	Number	Mean	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
Awareness	361	37.41	6.22	16.00	45.00	1.41	1.65
Attitude	361	49.01	4.08	44.00	67.00	1.01	1.49

The One-way analysis of variance (ANOVA) test indicated significant differences in students' awareness of HPV based on their field of study ($P<0.001$). Post-hoc Tukey tests further revealed that students in Medicine and Nursing demonstrated significantly higher levels of awareness compared to those in Psychology and Laboratory Sciences ($P<0.05$). Similarly, students in Midwifery exhibited greater awareness than students in Psychology and Laboratory Sciences ($P<0.05$). Additionally, students in Public Health and Operating Room Technology showed higher awareness levels than students in Laboratory Sciences ($P<0.05$). There were no significant differences in students' attitudes towards HPV across different fields of study ($P=0.776$). However, ANOVA results revealed significant differences in students' awareness based on age group ($P<0.001$). Awareness among students aged over 25 years was significantly higher compared to the other age groups ($P<0.05$). Similarly, students aged 23-25 years demonstrated greater awareness than those aged 18-20 years ($P<0.05$). The difference in awareness between the 21-22 years group and the 23-25 years group was not

significant ($P=0.280$), though students aged 21-22 years exhibited significantly higher awareness compared to those aged 18-20 years ($P<0.05$). Independent t-tests found no significant differences in awareness or attitudes between single and married participants.

ANOVA results revealed significant differences in awareness across academic years ($P<0.001$). Post-hoc Tukey tests indicated that students in their 3rd and 4th years demonstrated higher levels of awareness compared to 1st- and 2nd-year students ($P=0.005$). Interns showed significantly greater awareness than 1st- and 2nd-year students as well as those in basic sciences ($P<0.001$). Similarly, externs (stagers) exhibited higher awareness than 1st- and 2nd-year students and basic sciences students ($P<0.001$, $P=0.022$). Physiopathology students also demonstrated greater awareness than 1st- and 2nd-year students and basic sciences students ($P<0.001$, $P=0.022$). However, no significant differences in attitudes towards HPV were observed based on academic year ($P=0.641$). The percentage of vaccine acceptance varied significantly across fields of study ($P=0.020$). Acceptance rates were notably low in Psychology

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and Public Health. In contrast, Medicine showed a higher acceptance rate of 60.5%, while Allied Health Sciences exhibited an acceptance rate of 37.2%. ([Table 6](#)).

Table 6 HPV Vaccine Acceptance by Field of Study

Field	Not Vaccinated (%)	Vaccinated (%)	Total (%)
Psychology	3.6%	0.0%	5.5%
Allied Health	50.9%	37.2%	49.3%
Public Health	3.3%	2.3%	5.0%
Medicine	37.4%	60.5%	40.2%

The Chi-square test results demonstrated a significant relationship between HPV vaccine acceptance and academic year ($P=0.003$). Students in their 1st and 2nd years, as well as those in Basic Sciences, exhibited lower acceptance rates. In contrast, higher acceptance rates were observed among students in their 3rd and 4th years, as well as Interns, when compared to 1st and 2nd-year students. The highest acceptance rates were found among Externs (Stagers) and Physiopathology students ([Table 7](#)).

Table 7 HPV Vaccine Acceptance by Academic

Year

Academic Year	Not Vaccinated	Vaccinated	Total	P Value
1st and 2nd Year	165 (51.9%)	10 (23.3%)	175	0.003
3rd and 4th Year	34 (8.5%)	7 (16.3%)	41	

4th Year	(10.7%)	(16.3%)		
Intern	26 (8.2%)	4 (9.3%)	30	
Extern (Stager)	34 (10.7%)	12 (27.9%)	46	
Physiopathology	32 (10.1%)	7 (16.3%)	39	
Basic Sciences	27 (8.5%)	3 (7.0%)	30	

The Chi-square test ([Table 8](#)) indicated no statistically significant relationship between vaccine acceptance and marital status ($P=0.146$). All vaccinated participants were single, but this result was not significant.

Table 8 HPV Vaccine Acceptance by Marital Status

Marital Status	Not Vaccinated	Vaccinated	Total	P Value
Single	299 (94.0%)	43 (100.0%)	342	0.146
Married	19 (6.0%)	0 (0.0%)	19	

The Chi-square test results showed a significant relationship between vaccine acceptance and age group ($P=0.007$). Acceptance rates increased with age. The >25 years and 23-25 years groups had higher acceptance rates. ([Table 9](#))

Table 9 HPV Vaccine Acceptance by Age Group

Age Group	Not Vaccinated	Vaccinated	Total	P Value
18-20	93 (29.2%)	5 (11.6%)	98	0.007
21-25	132 (30.8%)	15 (33.3%)	147	

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22	(41.5%)	(34.9%)		
23-25	60 (18.9%)	16 (37.2%)	76	
>25	33 (10.4%)	7 (16.3%)	40	

Discussion:

This study involved a diverse group of 361 female students from Islamic Azad University in Sari, representing various academic disciplines. The distribution of students by field of study was 5.5% in psychology, 9.1% in midwifery, 5% in health sciences, 6.4% in laboratory sciences, 6.1% in operating room technology, 27.7% in nursing, and 40.2% in medicine. The students were categorized into four age groups: 27.1% were aged 18-20, 40.7% were aged 21-22, 21.1% were aged 23-25, and 11.1% were older than 25 years. In terms of marital status, a significant majority (94.7%) were single, while 5.3% were married. Regarding academic level, 48.5% of students were in their first or second year, 11.4% were in their third or fourth year, 8.3% were interns, 12.7% were stagiaires, 10.8% were at the physiopathology stage, and 8.3% were in the basic sciences stage. Among the 361 female students, 11.9% had been vaccinated against human papillomavirus (HPV), while 88.1% had not received the vaccine.

The results indicated a significant difference in students' awareness of HPV based on their field of study. Medical and nursing students exhibited significantly higher awareness than those studying psychology and laboratory sciences. Additionally, midwifery students demonstrated significantly

greater awareness compared to those in laboratory sciences and psychology. Students in health sciences and operating room technology also showed higher awareness than their counterparts in laboratory sciences. However, no significant differences were observed in students' attitudes toward HPV across different fields of study.

In our examination of students' awareness and attitudes towards the human papillomavirus (HPV) by age group, we observed notable differences in awareness levels. The over-25 age group showed higher awareness compared to the other groups. Additionally, students aged 23-25 demonstrated greater awareness than those in the 18-20 age bracket. However, there was no significant difference in HPV awareness between the 23-25 and 21-22 age groups. Furthermore, the 21-22 age group exhibited significantly higher levels of awareness compared to the 18-20 group.

The results showed no substantial difference in awareness and attitudes between single and married individuals. However, significant differences were observed regarding students' awareness of HPV based on their academic year. Specifically, third- and fourth-year students demonstrated greater awareness compared to first- and second-year students. Interns also exhibited higher awareness than both first- and second-year students, as well as those in basic sciences. Similarly, stagiaires showed greater awareness than first- and second-year students and basic sciences students. Additionally, physiopathology students displayed higher

awareness of HPV compared to first- and second-year students and those in basic sciences. Nevertheless, no significant differences were found in students' attitudes toward HPV across different academic years.

References

1. Sendagorta-Cudós, E., J. Burgos-Cibrián, and M. Rodríguez-Iglesias, *Genital infections due to the human papillomavirus*. Enfermedades infecciosas y microbiología clínica (English ed.), 2019. **37**(5): p. 324-334.
2. Brianti, P., E. De Flammineis, and S.R. Mercuri, *Review of HPV-related diseases and cancers*. New Microbiol, 2017. **40**(2): p. 80-85.
3. Ntanasis-Stathopoulos, I., et al., *Current trends in the management and prevention of human papillomavirus (HPV) infection*. J buon, 2020. **25**(3): p. 1281-1285.
4. Osmani, V. and S.J. Klug, *HPV-Impfung zur Prävention von Genitalwarzen und Krebsvorstufen—Evidenzlage und Bewertung*. Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz, 2021. **64**(5): p. 590.
5. Mattoscio, D., A. Medda, and S. Chiocca, *Human papilloma virus and autophagy*. International journal of molecular sciences, 2018. **19**(6): p. 1775.
6. Serrano, B., et al., *Epidemiology and burden of HPV-related disease*. Best practice & research Clinical obstetrics & gynaecology, 2018. **47**: p. 14-26.
7. Doorbar, J., et al., *Human papillomavirus molecular biology and disease association*. Reviews in medical virology, 2015. **25**: p. 2-23.
8. Aupérin, A., *Epidemiology of head and neck cancers: an update*. Current opinion in oncology, 2020. **32**(3): p. 178-186.
9. Burd, E.M. and C.L. Dean, *Human papillomavirus*. Diagnostic Microbiology of the Immunocompromised Host, 2016: p. 177-195.
10. Burness, J.V., J.M. Schroeder, and J.B. Warren, *Cervical colposcopy: indications and risk assessment*. American family physician, 2020. **102**(1): p. 39-48.
11. Rosalik, K., C. Tarney, and J. Han, *Human papilloma virus vaccination*. Viruses, 2021. **13**(6): p. 1091.
12. Ramezankhani, A. and F. Bahrambeygi, *Educational interventions planned to increase human papillomavirus vaccination acceptance among adolescents and their parents in Asia: a systematic literature review*. Journal of Preventive, Diagnostic and Treatment Strategies in Medicine, 2024. **3**(1): p. 27-36.
13. Vincent, S.C., et al., *A Systematic Review of Knowledge, Attitudes, and Factors Influencing HPV Vaccine Acceptance Among Adolescents, Parents, Teachers, and Healthcare Professionals in the Middle East and North Africa (MENA) Region*. Cureus, 2024. **16**(5).
14. Yohannes, E., et al., *Knowledge and attitude toward human papillomavirus vaccination and associated factors among adolescent school girls in Ambo town, Ethiopia, 2021: A multicenter cross-*

sectional study. Health Science Reports, 2023.

6(6): p. e1305.

15. Taebi, M., et al., *Knowledge and attitude toward human papillomavirus and HPV vaccination in Iranian population: a systematic review*. Asian Pacific journal of cancer prevention: APJCP, 2019. **20**(7): p. 1945.