Original Article

# Human Papilloma Virus Infection and HPV Vaccination: Awareness and Acceptability Among Medical Students

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## Abstract

Objective: To evaluate the awareness and acceptability of Human Papilloma Virus infection and its vaccination among medical students.
Methodology: This Cross-sectional study was conducted on medical students of 1st year to 5th year from December 2021 to February 2022. All students who were willing to participate and gave consent were included in the study. Data was entered in SPSS version 23 and analyzed using mean for quantitative variables and percent for qualitative variables.
Results: Total number of students were 384 including 229(59.63%) from pre-clinical years and 155(40.35%) from clinical years. Their mean age was 21.43+1.5 years. On comparison of pre-clinical to clinical years most of the students were aware of the sexually transmitted nature of infection i.e., 69% vs. 94.2%, Pap smear as screening method i.e., 72.55 vs. 97.9%. However, percentage of correct answers regarding symptomatology of HPV infection, and its risk factors was less than 50%. Only 36.5% students from pre-clinical years versus 52.9% students from clinical years have heard about HPV vaccine while 9% versus 5.2% of students were vaccinated against HPV. Common barriers to HPV vaccination identified by the students of pre-clinical versus clinical years was lack of awareness about availability of HPV vaccine i.e., 64.32% vs. 52.48% followed by the belief of not being at risk of HPV infection i.e. 59.29% vs.49.64% and high cost of vaccine i.e., 53.26% vs. 44.68% respectively.
Conclusion: Awareness about HPV infection and its vaccine was low but they have good acceptability for HPV vaccination. Major barrier to HPV vaccination was lack of awareness.
Keywords**:** Human papilloma virus, infection, vaccine.

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## Introduction

In developing world, cervical cancer is a major cause of gynaecological cancer deaths in women of reproductive age. Pakistan has over 45 million women of age 15 years, and above who are at risk of developing cervical cancer. According to the Globocan report, there were approximately 11,000 new cases of cervical cancer and 6500 deaths due to cervical cancer in Pakistan in 2020.[1]

HPV is a group of more than 200 viruses, of which more than 40 are spread through direct sexual contact. The different strains of human papilloma virus are responsible for cervical, vaginal, vulval, anal, and pharyngeal cancer in females. HPV may cause anal and penile cancer in males as well. HPV types 16, and 18 have high oncogenic potential. These are responsible for 70% of all pre-malignant and malignant lesions. HPV types 6, and 11 are low risk strains associated with abnormal Pap smear, and genital warts.[2] Most of the HPV infections clear spontaneously however HPV infection may become chronic, and precancerous lesions progress to invasive cervical cancer.[3]

Prevention is better than cure. HPV vaccines are vaccines that protect against infection with Human Papilloma Viruses (HPV). Food and Drug Authority (FDA) approved HPV vaccine in 2006. HPV-2 vaccine

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is bivalent and is protective against HPV 16 and 18. HPV-4 is tetravalent vaccine that is protective against HPV types 6, 11, 16, and 18. Recently a nano-valent HPV vaccine that is protective against cervical, vulval, vaginal and anal cancer caused by HPV types 6, 11, 16, 18,31,33,45,52 and 58. It also gives protection against genital warts caused by HPV types 6 and 11. HPV vaccine only provides protection against the disease caused by HPV not treatment. Moreover, it does not provide protection in those who have been already exposed to disease.[4]

All vulvar, vaginal and anal cancers are not caused by HPV. HPV vaccine may not provide protection in all recipients. Therefore, all women should also undergo recommended cervical screening program. HPV vaccination is included in national immunization program of developed countries but in developing countries no such initiatives are in progress due to resource constrains.[5]

Knowledge of Human Papilloma Virus and its vaccination is essential to create awareness among the community. Today's medical students are future health care provider so they must be aware of the Human Papilloma Virus, HPV vaccine, its hazards, availability of HPV-vaccine, its efficacy, and safety to reduce HPV-related infections. The aim of the study was to determine the awareness and acceptability of medical students regarding Human Papilloma Virus and HPV-vaccination. This study will provide an insight of medical students about awareness and acceptability towards HPV and its vaccination in local context.

## Methodology

This cross-section study was conducted on medical students of 1st year to 5th year after ethical approval from December 2021 to February 2022. Students of first year to third year were grouped as pre-clinical years and 4th year to final as clinical years. Students in their respective classes were briefed about the study objectives. All students who gave consent were included in the study while those who were not willing to participate were excluded. Non-probability convenience sampling was used. Taking confidence interval 95% with a significant difference of 0.05 and assumed 24% of students were aware of Human Papilloma Virus, and HPV vaccination; calculated sample size was equal to 285 participants.[6]

Data was collected on structured questionnaire comprised of demographic characteristics of respondents i.e., age, gender, marital status and year of MBBS. Questions to assess the awareness about Human Papilloma Virus, cervical screening, HPV vaccination, and acceptability towards HPV vaccination were also included. Types of questions were true/false type. Privacy and confidentiality of the participants was ensured. Questionnaire was distributed in the classroom and after its completion correct answers were discussed with the study participants.

Data was entered in SPSS version 23. Quantitative variables like age of participants were calculated using mean and standard deviation. Qualitative variables like gender, marital status, and their responses about awareness and acceptability about HPV and is vaccination were calculated using percent. Different variables among pre-clinical and clinical groups were compared using Chi-square and P value ≤0.05 was considered statistically significant.

## Results

Total number of students were 384 including first year to final year medical students. Students from pre-clinical years were 229(59.63%) and 155(40.35%) were from clinical years. Their mean age was 21.43+1.5 years ranging from 18-25 years. Their gender distribution and marital status is given in table I.

Barriers to HPV vaccination were also explored from the participants who were neither vaccinated nor want to get vaccinated. Most common barrier identified by the students of pre-clinical and clinical years were lack of awareness about availability of HPV vaccine followed by the belief of not being at risk of HPV infection, high cost of HPV vaccine, fear of side effects and worry about the efficacy of HPV vaccine as shown in figure I.

**Table I: Demographics of study participants.**

| | | Pre-clinical years N (%) | Clinical years N (%) |
|---|---|---|---|
| **Gender** | Female | 145(63.3) | 99(63.9) |
| | Male | 84(36.7) | 56(36.1) |
| **Marital status** | Unmarried | 220(96) | 124(80) |
| | Married | 9(4) | 31(20) |

## Discussion

HPV-related infections such as cervical cancer are associated with high morbidity and mortality. HPV vaccine is safe, and effective at preventing HPV-related infections and cancers.[1] Awareness about the

**Table II: Awareness about Human Papilloma Virus and HPV vaccine**

| **Knowledge about Human Papilloma Virus (HPV) infection & cervical screening** | Pre-clinical year students N=229 | | Clinical year students N=155 | | p-value |
|---|---|---|---|---|---|
| | **Correct** N (%) | **Incorrect** N (%) | **Correct** N (%) | **Incorrect** N (%) | |
| HPV infection may show no symptoms. | 97(42.36) | 132(57.64) | 73(47.10) | 82(52.90) | 0.841 |
| HPV is sexually transmitted infection. | 158(68.99) | 71(31.00) | 146(94.19) | 9(5.81) | 0.000 |
| HPV infects only those who have multiple sexual partners. | 110(48.03) | 119(51.96) | 88(56.77) | 67(43.23) | 0.092 |
| Both men and women are infected with HPV infection. | 187(81.66) | 42(18.34) | 140(90.32) | 15(9.67) | 0.019 |
| HPV causes only cervical cancer in females. | 121(52.84) | 108(47.16) | 80(51.61) | 75(48.39) | 0.813 |
| HPV causes anal and penile cancer in males. | 142(62.01) | 87(37.99) | 109(70.32) | 46(29.67) | 0.092 |
| Genital warts are caused by same Human Papilloma virus that cause cervical cancer. | 87(37.99) | 142(62.01) | 59(38.06) | 96(61.94) | 0.988 |
| Pap smear is a screening method for premalignant cervical disease. | 166(72.49) | 63(27.51) | 151(97.42) | 04(2.58) | 0.000 |
| **Knowledge about HPV vaccination** | | | | | |
| Do you know/heard about HPV vaccine? | 84(36.68) | 145(63.32) | 82(52.90) | 73(47.10) | 0.001 |
| HPV vaccine is commercially available in Pakistan. | 92(40.17) | 137(59.83) | 91(58.71) | 64(41.29) | 0.000 |
| HPV vaccine is protective against cervical cancer | 147(64.19) | 82(35.80) | 135(87.10) | 20(12.90) | 0.000 |
| A single dose of HPV vaccine is recommended. | 118(51.53) | 111(48.47) | 89(57.42) | 66(42.58) | 0.255 |
| After HPV vaccination, women don't need screening for cervical cancer | 126(55.02) | 103(45.98) | 143(92.26) | 12(7.74) | 0.000 |
| HPV vaccine is protective against penile cancer | 132(57.64) | 97(42.36) | 98(63.23) | 57(36.77) | 0.273 |

| **Attitude towards HPV Vaccination** | | Response | Pre-clinical students N (%) | Clinical students N (%) | p-value |
|---|---|---|---|---|---|
| Have you ever received vaccination for HPV. | | Yes | 18(07.86) | 09(05.81) | 0.439 |
| | | No | 211(92.14) | 146(94.19) | |
| Should HPV vaccination be routinely prescribed to young population of Pakistan to prevent HPV related cancers? | | Yes | 187(81.66) | 145(93.55) | **0.000** |
| | | No | 42(18.34) | 10(6.45) | |
| If you have not received HPV vaccination on whom advice would you like to get vaccinated | Doctor | | 163(77.25) | 108(74) | |
| | Family/Friends | | 18(8.53) | 7(4.8) | |
| | Will get in any case | | 18(8.53) | 26(17.8) | |
| | Will not get in any case | | 12(5.69) | 5(3.4) | |

causative factors of the disease and available vaccines against Human Papilloma Virus is essential for prevention, and control of HPV related infections. Preventing cancer with the help of a vaccine is comparatively new concept and a great achievement in the field of medicine.[7]

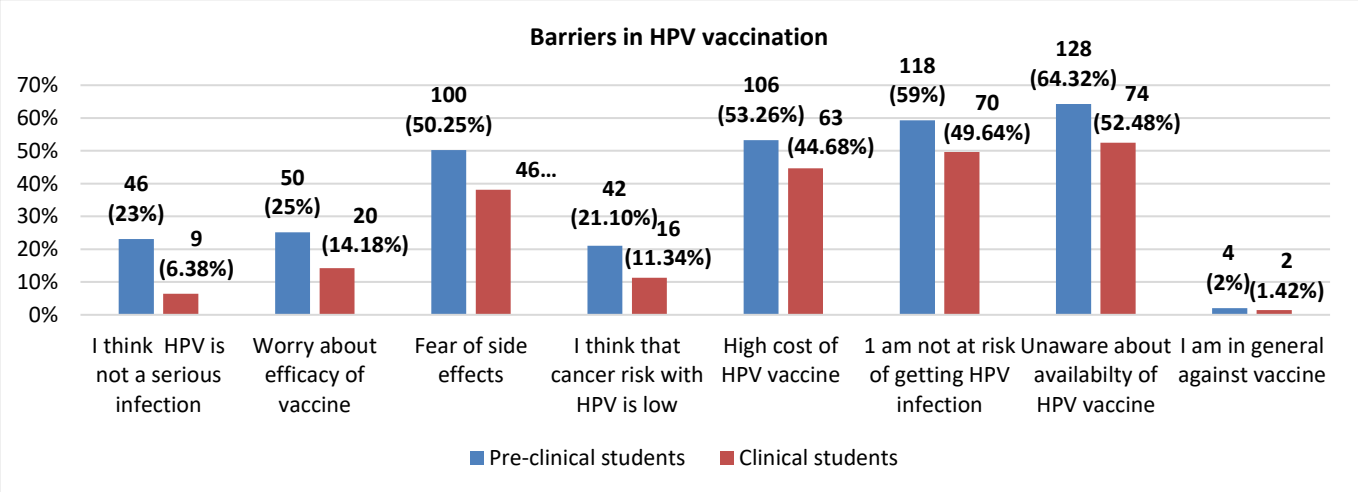


**Figure I: Barriers in HPV vaccination**

On comparison of pre-clinical versus clinical years students, most of them were aware of the sexually transmitted nature of infection i.e., 69% vs. 94.2%, Pap smear as screening method i.e., 72.55 vs. 97.9%.

However, percentage of correct answers was less than 50% regarding symptomatology of HPV infection, and its risk factors. Only 36.5% versus 52.9 % students from pre-clinical versus clinical years have heard about HPV vaccine. Awareness about HPV vaccine was significantly improved among students of clinical years. Two third (71%) of the respondents were aware of HPV, and among them 81.2% mentioned vaccination against HPV. However overall awareness about HPV infection and its vaccination was low as revealed by study conducted in South Africa.[8] According to a study conducted in India; 95.7% of male students and 98.8% female students were aware about the etiology, prevention of cervical cancer, information regarding the dosage, schedule, site and route of administration of HPV vaccine.[9] According to a study conducted in China; majority of the students (87.7%) reported that they do not have sufficient information regarding HPV infection.[11] So it is important to create awareness about its risk factors, associated morbidity, and prevention at multiple forums using lectures, group discussions, workshops, and seminars to inculcate the gravity of the condition. Although it is important that medical students should know about the basics of diseases but relevant recent advances should be emphasized.

Although small percentage (9%, and 5.2%) of pre-clinical versus clinical years students were vaccinated against HPV vaccination however they had a positive attitude towards HPV vaccination. Majority of students (92.15 and 94.2%) of pre-clinical and clinical years responded that HPV vaccination should be routinely prescribed to the young generation of Pakistan to prevent HPV related infections and associated morbidity. According to study by Mohammad et al, 86.7% of respondents intend to prescribe HPV vaccines.[12]

Students who have not received HPV vaccination, they were further explored whether they would be willing to get vaccinated or not. Majority of students were willing to get vaccinated against Human papilloma Virus i.e., pre-clinical years students 94.3% and 96.6% students from clinical years. A multi-center survey conducted in China revealed that more than 60% of the medical students reported hesitancy about the HPV vaccine.[10]

In a study conducted in Banglore;35.7% males and 92.5% females students were willing to get vaccinated.[9] However only 39.6% medical students in Southwest Nigeria accepted HPV vaccination; this may be due to cultural, and regional differences.[13]

Although overall knowledge about HPV and vaccine against HPV is low in medical students but they have positive attitude towards HPV vaccine for prevention of HPV related infections and morbidities. However, 5.2% students from pre-clinical years and 3.4% from clinical years refused to get vaccinated. Barriers to HPV vaccination was also explored. Lack of awareness about HPV vaccine was the major barrier of HPV vaccination identified in this study. Second common reason was the belief that they are not at risk of getting HPV infection followed by “high cost of HPV vaccine” and fear of side effects. Study conducted by Pandey et al revealed that inadequate information (56.8%), high cost (21.2%), worry about complications (17.6%) and fear of side-effects (17.6%) were the major barriers.[14] It was also endorsed by Adejuyigbe et al that inadequate information and high costs were the common barriers.[13]

Medical students are the backbone of health care system so it is crucial to create awareness among them to control and eradicate this infection. Knowledge gaps should be identified and addressed.[15] Awareness campaigns should be arranged at mass level to clear the myths about vaccines. HPV vaccination should be part of National Immunization Program. It should be made freely available and should be free of cast.[16] It should be well understood that the mere availability of an effective vaccine is not beneficial without an effective vaccination program at national level.

HPV vaccine safety by the Centers for Disease Control and Prevention (CDC) found no difference in side effects between vaccinated and unvaccinated individuals.[17,18] The benefit of vaccines is undoubtedly to reduce the incidence of infectious diseases, and in the case of HPV, prevent the development of persistent infections leading to cervical cancer.[18,19] Even so, the side effects must be closely monitored, and reported without bias, to ensure that the benefits outweigh the risks.[20]

## Conclusion

Although overall awareness about Human Papilloma Virus Infection and HPV vaccine is low among medical students however, they have positive attitude towards

HPV vaccine for prevention of HPV related infections and morbidities. The major barriers for HPV vaccination are lack of awareness, belief of not being at risk of HPV infection, high cost of HPV vaccine, fear of side effects and worry about the efficacy of HPV vaccine.

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