

Research Article

Knowledge, Attitude, and Awareness Regarding HPV Infection and Vaccination among Medical Students: A Cross-Sectional Study at Government Doon Medical College, Dehradun

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Abstract

Background: Human papillomavirus (HPV) infection is the major cause of cervical cancer. HPV vaccination is an effective preventive measure, but gaps in awareness and knowledge remain. **Objective:** To assess knowledge, awareness, and attitudes regarding HPV infection and vaccination among medical students at Government Doon Medical College, Dehradun. **Methods:** A cross-sectional study was conducted among 246 medical students using a pretested questionnaire. **Results:** Awareness of HPV, its association with cervical cancer, and vaccine availability was 56.9%, 84.5%, and 89.4%, respectively. Only 34.5% knew the recommended vaccination age, while 67.8% reported being

vaccinated. Most participants (91.2%) supported including HPV vaccination in the National Immunization Schedule. **Conclusion:** Despite positive attitudes toward HPV vaccination, important knowledge gaps remain. Targeted educational programs and improved vaccine accessibility are needed to increase vaccination coverage and prevent cervical cancer.

Keywords: HPV, cervical cancer, vaccination, awareness, medical students.

INTRODUCTION

Cervical cancer is one of the leading causes of cancer-related morbidity and mortality among women worldwide and remains a major public health problem, especially in developing countries like India (1). In India,

cervical cancer accounts for a significant proportion of cancer deaths among women, with more than 74,000 deaths reported annually (2). The major risk factors for cervical cancer include early age of marriage, multiple pregnancies, poor genital hygiene, smoking, multiple sexual partners, and low socioeconomic status (3). Cervical cancer is primarily a sexually transmitted disease, with persistent infection by Human Papillomavirus (HPV) identified as the main etiological agent (4). High-risk HPV strains such as 16, 18, 31, 33, 45, 52, and 58 are strongly associated with the development of cervical cancer, whereas low-risk types such as 6 and 11 are responsible for benign conditions like genital warts (5). HPV infection may lead to a spectrum of diseases ranging from genital warts to cervical cancer and other anogenital malignancies (4).

Prophylactic vaccination against HPV has emerged as an effective strategy for the prevention of cervical cancer. Currently available vaccines include the bivalent vaccine (Cervarix) targeting HPV types 16 and 18, the quadrivalent vaccine (Gardasil) targeting types 6, 11, 16, and 18, and the nonavalent vaccine (Gardasil 9), which provides broader protection against additional high-risk strains (6). Recently, an indigenously developed vaccine, Cervavac, has also been introduced in India targeting HPV types 16 and 18. **HPV vaccination is recommended for adolescent girls aged 9–13 years and can be administered up to 26 years of age. Black and white clinical efficacy of the vaccine is highest when administered prior to sexual exposure and exposure to HPV. Therefore, routine vaccination is primarily targeted at younger age groups, though catch-up vaccination remains beneficial up to age 26.** It is also recommended for boys in certain age groups to reduce transmission. These vaccines have been found to be safe,

highly immunogenic, and effective in preventing HPV infection and related diseases (7).

Despite the availability of effective vaccines, uptake remains suboptimal due to factors such as high cost, lack of awareness, cultural and religious beliefs, and social stigma associated with sexually transmitted infections. According to recent estimates, approximately 79,906 women died due to cervical cancer in India in 2023, highlighting the urgent need for preventive strategies. Therefore, increasing awareness regarding HPV infection and its vaccination is essential, especially among young adults who can act as key agents of change in society. The present study aims to assess the knowledge, attitude, and awareness regarding HPV infection and HPV vaccination among college students at Government Doon Medical College, Dehradun.

MATERIAL AND METHODS

This study was conducted at Government Doon Medical College, Dehradun, in the Department of Obstetrics and Gynaecology. It is a cross-sectional study conducted among the medical students of Government Doon Medical College, Dehradun. Informed consent was obtained, and a pretested questionnaire was given to each participant. Data were collected and analyzed. The questionnaire comprised four sections, namely: demographic details, awareness, knowledge about Human Papillomavirus (HPV), awareness and acceptability of HPV vaccination, and knowledge about cervical cancer.

RESULTS

1. Demographic and General Awareness

A total of 246 participants completed the survey. The majority belonged to the 18–20 age group (114 participants, 46.34%),

followed by the 21–25 age group (89 participants, 36.17%), and the 24–26 age group (43 participants, 17.47%). Regarding gender distribution, the study included 146 female participants (59.35%) and 100 male participants (40.65%).

In terms of basic awareness, 56.90% (140 participants) had heard of HPV, 84.50% (208 participants) recognized its link to cervical cancer, and 89.40% (220 participants) were aware of the existence of an HPV vaccine

Table 1: Demographic Profiles and Basic Awareness Levels among Participants

Variables	Category (N)	Percentage (%)
Age Group	18–20 Years (114)	46.34%
	21–25 Years (89)	36.17%
	24–26 Years (43)	17.47%
Gender	Female (146)	59.35%
	Male (100)	40.65%
Basic Awareness	Heard of HPV (140)	56.90%
	Link to Cervical Cancer (208)	84.50%
	Aware of Vaccine existence (220)	89.40%

2. Comprehensive Knowledge of HPV and Vaccination

Table 2: Participant Performance Across Specific Knowledge Criteria

Knowledge Criteria	Correct Responses (N)	Correct (%)	Incorrect/Don't Know (%)
Primary Transmitter of HPV	213	86.5%	13.5%
Gender at High Risk	31	12.6%	87.4%
Recommended Age for Vaccine	85	34.5%	65.5%
Eligibility (Who can receive)	41	16.6%	83.4%
Dosage Schedule	137	55.6%	44.4%

Vaccine Availability in India	127	51.6%	48.4%
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3. Attitudes and Perception Towards Vaccination

The survey revealed a generally positive attitude toward the vaccine, though actual uptake varied. **Notably, 67.8% of the participants reported having actually received the HPV vaccine themselves. Regarding perceptions of vaccine utility, 76.4% of respondents believed that the vaccine is necessary and effectively prevents cervical cancer.** Furthermore, 82.3% stated they would recommend the vaccine to their future patients, and 91.2% believed it should be integrated into the National Immunization Schedule (NIS).

Table 3: Participant Attitudes and Self-Reported Vaccine Acceptance

Statement	Yes (%)	No (%)	Other/Neutral (%)
Vaccine prevents Cervical Cancer / Education is Necessary	76.4%	23.6%	0%
Would recommend to patients	82.3%	17.7%	0%
Should be part of NIS	91.2%	8.8%	0%
Have you been vaccinated?	67.8%	32.2%	0%

DISCUSSION

Cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women worldwide. Persistent infection with high-risk strains of Human Papillomavirus (HPV) is recognized as the most important etiological factor in the development of cervical cancer. Increasing awareness regarding HPV infection, its mode of transmission, and the role of vaccination is therefore essential for effective prevention. The present study was conducted to assess the knowledge and awareness regarding cervical cancer and HPV vaccination among college students of GDMC, Dehradun.

In the present study, 56.9% of participants

were aware of HPV infection and its association with cervical cancer. Although this reflects a moderate level of awareness among students, it still indicates that a significant proportion of the population lacks adequate knowledge about HPV and its consequences. Similar findings have been reported in other studies conducted among young adults and students. A study conducted in South Africa reported that 73% of participants were unaware of HPV infection, highlighting the global gap in awareness regarding HPV and its role in cervical cancer.

Gender-based differences in awareness were also observed in the present study. **Female participants demonstrated a significantly**

higher awareness level of 71.9% compared to their male counterparts, who showed only 27.1% awareness. This pronounced disparity highlights a critical gap in male medical education regarding reproductive health. Because HPV-driven pathologies are historically framed around maternal and gynecological health, male students face far less academic and societal exposure to these metrics. Rectifying this imbalance is vital, as male vaccination and awareness are essential pillars for achieving herd immunity and minimizing transmission vectors. This finding is consistent with the results of previous studies including those conducted by Husain et al., where females demonstrated better knowledge regarding cervical cancer and HPV vaccination.

The present study also demonstrated a relatively high proportion of vaccinated participants, with 67.8% reporting that they had received the HPV vaccine. This represents a promising foundation within an institutional healthcare student cohort. This finding is encouraging when compared with several previous studies conducted in similar populations. A study conducted among medical and paramedical students in India reported that although 75% of students were aware of HPV vaccination, only 26.7% had actually received the vaccine, demonstrating a stark gap between awareness and vaccine uptake elsewhere.

Knowledge regarding the mode of transmission of HPV infection was relatively high in the present study, with 86.5% of participants correctly identifying sexual contact as the primary mode of transmission. Furthermore, 84.5% of participants were aware of the association between HPV infection and cervical cancer. Similar levels of knowledge have been reported in studies conducted among medical students, where awareness regarding HPV infection and its role in

cervical cancer prevention was moderate but not universal.

Despite this general awareness, detailed knowledge regarding vaccination eligibility remained low. In our cohort, only 16.6% of participants possessed an accurate and adequate understanding of the specific eligibility, age criteria, and dosage profiles required for vaccination. This deficiency within a medical student cohort is concerning, as these individuals are future frontline healthcare providers. If clinicians are unclear on explicit dosing timelines and catch-up patient eligibility, patient counseling suffers, which directly perpetuates suboptimal immunization rates across the wider public. Similar findings have been reported in other studies where participants were aware of HPV vaccination but lacked knowledge regarding vaccine schedule, dosage, and recommended age groups.

An encouraging finding of the present study was the positive attitude toward preventive measures, with 91.2% of participants agreeing that HPV vaccination should be included in the National Immunization Schedule (NIS). Positive attitudes toward HPV vaccination among students have also been reported in other studies, suggesting that increasing awareness may significantly improve vaccination uptake. An increase in awareness was also observed with increasing age among participants, with the 21–25 year age group accounting for the highest proportion of awareness (36.17%). Similar trends have been observed in previous studies where older students demonstrated better knowledge due to greater academic exposure and health-related education.

Despite these encouraging findings, several barriers continue to affect HPV vaccination uptake in India. Cultural beliefs, social stigma associated with sexually transmitted infections, lack of awareness, financial

constraints, and misconceptions regarding vaccine safety continue to limit widespread vaccination. Previous studies have also highlighted that societal, socioeconomic, and religious factors influence acceptance of HPV vaccination, particularly among young women.

The findings of the present study highlight the importance of strengthening educational initiatives regarding HPV infection and cervical cancer prevention. Incorporating structured awareness programs within college curricula and implementing school-based vaccination programs with subsidized costs could significantly improve vaccine accessibility and coverage among adolescents and young adults.

However, certain limitations should be considered while interpreting the results of the present study. The study included 246 participants from a single institution, which may not fully represent the awareness levels of the wider population. Additionally, the use of a questionnaire-based survey introduces the possibility of response bias, recall bias, and the potential influence of participants discussing responses among themselves. Despite these limitations, the study provides valuable insights into the level of knowledge and awareness regarding HPV infection and cervical cancer prevention among college students. Strengthening awareness programs and improving accessibility to HPV vaccination could significantly contribute to reducing the burden of cervical cancer in the future.

CONCLUSION

The present study demonstrates that while a moderate level of awareness regarding HPV infection and its association with cervical cancer exists among college students, significant gaps remain in detailed knowledge, particularly regarding vaccination eligibility and schedule. Female participants exhibited higher awareness

compared to males, and a generally positive attitude toward HPV vaccination was observed among the majority of participants. Despite relatively high awareness levels, discrepancies between knowledge and actual vaccine uptake continue to persist.

The findings highlight the need for targeted educational interventions, improved accessibility to HPV vaccines, and inclusion of HPV vaccination in national immunization strategies. Strengthening awareness programs at institutional and community levels, along with policy-level interventions such as subsidized vaccination and school-based immunization programs, can play a crucial role in improving vaccine coverage and ultimately reducing the burden of cervical cancer in the future.

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