



KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT CERVICAL CANCER AND HPV VACCINE AMONG MEDICAL AND NURSING STUDENTS: A CROSS-SECTIONAL STUDY

Dr. Apoorva Dore

Associate Professor and HOD, Department of Community Medicine, K V G Medical College, Sullia.

**Dr. Raja
Sudharsana
Manikandan M**

Post Graduate, Department of Community Medicine, K V G Medical College, Sullia

Dr. Dinesh P V

Professor and HOD, Department of Community Medicine, Kerala Medical College, Palakkad

Dr Indu Dinesh*

Senior Resident, Department of Community Medicine, K V G Medical College, Sullia *Corresponding Author

ABSTRACT

Background: Cervical cancer is a major public health concern worldwide and is primarily caused by persistent infection with high-risk human papillomavirus (HPV). Healthcare students are expected to possess adequate knowledge and positive attitudes regarding cervical cancer prevention and HPV vaccination, as they play a crucial role in future health promotion activities. This study assessed the knowledge, attitude, and practices (KAP) regarding cervical cancer and HPV vaccination among medical and nursing students. **Methods:** A cross-sectional study was conducted among 384 medical and nursing students of a tertiary teaching institution in Karnataka, India, from January to March 2024. Data were collected using a pretested semi-structured questionnaire assessing knowledge of cervical cancer and HPV, attitudes toward HPV vaccination, and preventive practices. Descriptive statistics and Chi-square test were used for analysis, with $p < 0.05$ considered statistically significant. **Results:** Most participants demonstrated good awareness regarding cervical cancer and HPV infection, with 84.9% identifying HPV as the causative agent and 79.9% recognizing its association with cervical cancer. However, knowledge gaps were observed regarding the recommended age for vaccination (54.9%) and vaccination for both sexes (58.1%). Although 68.0% expressed willingness to receive HPV vaccination, only 14.1% had been vaccinated. The main barriers to vaccination were vaccine cost (56.9%), lack of awareness at the appropriate age (25.2%), and fear of side effects (17.9%). Adequate knowledge was significantly associated with willingness to receive vaccination ($p = 0.002$). **Conclusion:** Despite satisfactory knowledge levels, HPV vaccine uptake among healthcare students remains low. The observed gap between knowledge and practice underscores the need for targeted educational interventions improved access to vaccination, and institutional initiatives to promote HPV vaccine uptake.

KEYWORDS : Cervical Cancer, Human Papillomavirus, Medical Students, Nursing Students.

INTRODUCTION

Cervical Cancer remains a major public health problem worldwide and is one of the leading causes of cancer-related morbidity and mortality among women. According to the World Health Organization (WHO), cervical cancer is the fourth most common cancer among women globally, with around 660 000 new cases and around 350 000 deaths in 2022.¹ Persistent infection with high-risk types of human papillomavirus (HPV), particularly types 16 and 18, is recognized as the primary etiological factor and accounts for nearly 70–75% of cervical cancer cases.²

The natural history of cervical cancer is characterized by a long preclinical phase, providing a valuable opportunity for early detection and intervention. Screening methods such as the Papanicolaou smear, visual inspection with acetic acid, and HPV DNA testing have proven effective in identifying precancerous lesions and reducing disease burden.³ In addition, HPV vaccination has emerged as a highly effective primary preventive strategy and is recommended for adolescents before the onset of sexual activity.⁴

Despite the availability of these preventive measures, the burden of cervical cancer remains high in India due to inadequate awareness, sociocultural barriers, and low uptake of screening and vaccination services.⁵ Healthcare professionals play a crucial role in promoting awareness and acceptance of preventive strategies. Medical and nursing students, as future healthcare providers, are expected to possess adequate knowledge and positive attitudes toward such interventions. However, deficiencies in their knowledge and practices may hinder effective dissemination of information and implementation of preventive programs.⁶

Therefore, the present study was undertaken to assess the knowledge, attitude, and practices regarding cervical cancer and HPV vaccination among medical and paramedical students in a tertiary teaching institution.

MATERIALS AND METHODS

This cross-sectional study was conducted among medical and nursing students of a tertiary teaching institute in Sullia over a period of three months from January 2024 to March 2024. The study population included all medical and nursing students enrolled in the institute during the study period. Universal sampling was adopted, and all eligible medical and nursing students present during the data collection period and willing to participate were included in the study. Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Written informed consent was obtained from all participants, and confidentiality and anonymity of the collected information were maintained throughout the study.

Data were collected using a pretested and semi-structured questionnaire that included sections on sociodemographic characteristics, knowledge regarding cervical cancer and HPV infection, attitudes toward HPV vaccination, and vaccination practices.

Knowledge was assessed using multiple-choice questions covering epidemiology, causation, transmission, screening, and vaccination. A composite knowledge score was generated, and participants scoring above the median were categorized as having adequate knowledge. Attitude was assessed based on willingness to receive HPV vaccination, while practice was evaluated based on vaccination status and participation in awareness activities.

Data were analyzed using descriptive statistics such as frequencies and percentages. Inferential statistics, including the Chi-square test, were used to assess associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included 384 participants with a mean age of 20.8 years, comprising both medical and nursing students across different years of study. The overall knowledge regarding cervical cancer and HPV infection was found to be moderately high. Approximately 78% of participants correctly identified cervical cancer as one of the most common cancers among women in India, while 85% recognized HPV infection as the primary cause. Around 80% were aware of the relationship between HPV and cervical cancer. However, only 62% correctly identified HPV types 16 and 18 as the major high-risk strains associated with cervical cancer.

Knowledge regarding transmission and prevention varied among participants. About 75% correctly identified sexual contact as the main mode of transmission. Awareness regarding screening methods was present in approximately 70% of participants. Knowledge regarding the ideal age for vaccination was comparatively low, with only 55% correctly identifying the recommended age group of 9–14 years. Similarly, only 58% were aware that HPV vaccination is recommended for both males and females, and about 60% knew that vaccination should preferably be taken before sexual debut. Approximately 65% correctly understood that HPV vaccination does not eliminate the need for cervical cancer screening.

With regard to attitude, 68% of participants expressed willingness to receive HPV vaccination, whereas 20% were not willing and 12% were unsure. Despite this, only 14% had actually received the vaccine. Among the unvaccinated participants, the most commonly reported reasons were cost of the vaccine, lack of awareness at the appropriate age, fear of side effects, and absence of recommendation by healthcare providers.

Participation in cervical cancer awareness activities was reported by only 28% of participants. The primary source of information regarding HPV vaccination was the medical curriculum, followed by internet and social media, healthcare professionals, and peers.

Participants with adequate knowledge were significantly more likely to express willingness to receive HPV vaccination ($p = 0.002$). No significant association was found between gender and vaccination status.

Table 1: Sociodemographic Characteristics of Study Participants (n = 384)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	≤20	168	43.8
	>20	216	56.2
Gender	Male	142	37.0
	Female	242	63.0
Course	MBBS	238	62.0
	Nursing	146	38.0
Year of Study	1st year	72	18.8
	2nd year	78	20.3
	3rd year	80	20.8
	4th year	74	19.3
	Intern	80	20.8
Marital Status	Unmarried	384	100

Table 2: Knowledge Regarding Cervical Cancer and HPV (n = 384)

Knowledge Variable	Correct Response (n)	Percentage (%)
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Cervical cancer as common cancer	300	78.1
HPV as causative agent	326	84.9
Aware of HPV–cervical cancer link	307	79.9
HPV types 16 & 18 identified correctly	238	62.0
Sexual transmission correctly identified	288	75.0
Awareness of screening methods	269	70.1
Correct age for vaccination (9–14 years)	211	54.9
Vaccine for both sexes	223	58.1
Vaccine before sexual debut	230	59.9
Vaccine does not replace screening	250	65.1

Table 3: Attitude and Practices Regarding HPV Vaccination (n = 384)

Variable	Category	Frequency (n)	Percentage (%)
Willingness to vaccinate	Yes	261	68.0
	No	77	20.1
	Not sure	46	12.0
Vaccination status	Vaccinated	54	14.1
	Not vaccinated	330	85.9
Participation in awareness activities	Yes	108	28.1
	No	276	71.9

Reasons for not receiving HPV vaccine

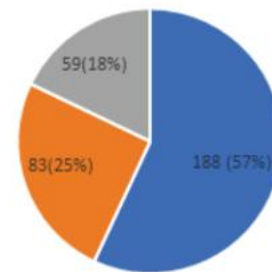


Figure 1: Reasons for Not Receiving HPV Vaccine (n = 330)

Table 5: Association Between Knowledge Level and Willingness to Vaccinate

Knowledge Level	Willing	Not Willing/Unsure	Total	p-value
Adequate Knowledge	190	60	250	
Inadequate Knowledge	71	63	134	
Total	261	123	384	0.002

DISCUSSION

The present study assessed the knowledge, attitude, and practices regarding cervical cancer and HPV vaccination among medical and nursing students. As future healthcare professionals, their awareness and acceptance of cervical cancer preventive strategies are essential for successful implementation of public health interventions.

In the present study, 84.9% of participants correctly identified HPV as the causative agent of cervical cancer and 79.9% recognized the association between HPV infection and cervical cancer. These findings indicate relatively good awareness among healthcare students and are comparable with studies conducted among medical students in India by Pandey et al. and Mehta et al., who reported that a majority of students were aware of the role of HPV in cervical

carcinogenesis.^{6,7} Similar levels of awareness were also reported by Sharma et al. and Desu et al., where healthcare students demonstrated satisfactory knowledge regarding cervical cancer etiology and prevention.^{8,9} The comparatively higher awareness observed in the present study may be attributed to increased incorporation of cervical cancer prevention topics into medical and nursing curricula and greater exposure to digital health information sources.

Knowledge regarding specific aspects of HPV infection and vaccination was comparatively lower. Only 62.0% of participants correctly identified HPV types 16 and 18 as the major oncogenic strains, while 54.9% knew the recommended vaccination age and 58.1% were aware that vaccination is recommended for both males and females. Similar deficiencies have been reported by Jenitha et al., Theertha and Kamath, and Poonia and Masand, who observed that although students were aware of HPV vaccination, detailed knowledge regarding vaccination schedules, target groups, and vaccine indications remained inadequate.^{10,11,12} These findings suggest that while general awareness is increasing, gaps persist in practical and guideline-based knowledge required for effective patient counselling.

Awareness regarding cervical cancer screening was reported by 70.1% of participants in the present study. This finding is higher than that reported among university students in South Africa by Hoque et al. and among Malaysian pre-university students by Kwang et al., where awareness regarding screening methods was substantially lower.^{13,14} The difference may be explained by the healthcare background of the present study participants, who are exposed to preventive medicine and gynecology training during their academic curriculum.

Regarding attitude toward HPV vaccination, 68.0% of participants expressed willingness to receive the vaccine. This finding is comparable to observations by Rashwan et al. among Malaysian medical and pharmacy students and by Di Giuseppe et al. among Italian adolescents and young women, who reported generally positive attitudes toward HPV vaccination despite varying levels of knowledge.^{15,16} Similar willingness was also reported by Kataria et al. and Chandila et al. among Indian medical students.^{17,18} Positive attitudes among healthcare students are encouraging because future healthcare providers significantly influence vaccine acceptance in the general population.

Despite favorable attitudes, actual vaccine uptake was remarkably low, with only 14.1% of participants reporting HPV vaccination. This finding reflects a substantial knowledge-practice gap and is consistent with previous studies among healthcare students. Pandey et al. reported low vaccine uptake despite adequate awareness among medical students in India.⁶ Similarly, Blödt et al. and Kumar et al. observed that awareness alone did not translate into vaccination behavior.^{19,20} The low vaccination coverage observed in the present study may reflect barriers such as vaccine cost, limited accessibility, lack of institutional vaccination programs, and misconceptions regarding personal risk.

Among unvaccinated participants, the most commonly cited barrier was vaccine cost (56.9%), followed by lack of awareness at the recommended age and fear of side effects. Similar barriers have been documented in studies by Dempsey et al., Kwan et al., and Chauhan et al., where financial constraints, safety concerns, and inadequate information were major reasons for vaccine hesitancy and non-uptake.^{21,22,23} These findings underscore the importance of integrating HPV vaccination into publicly funded immunization programs and implementing targeted awareness campaigns to address misconceptions.

Participation in cervical cancer awareness activities was reported by only 28.1% of participants. This relatively low level of engagement suggests that knowledge acquisition primarily occurs through formal academic teaching rather than active involvement in health promotion activities. Similar observations were reported by Singh et al., who emphasized the need for greater student participation in awareness campaigns and community outreach activities.²⁴ Increased participation in such activities could improve both knowledge retention and preventive health practices.

The present study found a statistically significant association between adequate knowledge and willingness to receive HPV vaccination ($p = 0.002$). This finding is consistent with studies by Laz et al., which demonstrated that greater awareness and understanding of HPV infection significantly improve vaccine acceptance.²⁵ The finding highlights the importance of educational interventions in promoting vaccine uptake among young adults.

CONCLUSION

The study concludes that although medical and nursing students have adequate knowledge regarding cervical cancer and HPV infection, important gaps persist, and vaccination uptake remains low. The observed gap between knowledge and practice underscores the need for targeted educational interventions. Launch of free HPV vaccination campaign for 14 year old girls by Government in 2026 contributes significantly to strengthen cervical cancer prevention efforts.

REFERENCES

1. World Health Organization. Human papillomavirus (HPV) and cervical cancer. Geneva: World Health Organization; 2023.
2. Bruni L, Diaz M, Barriónuevo-Rosas L, Herrero R, Bray F, Bosch FX, et al. Global estimates of human papillomavirus vaccination coverage. *Lancet Glob Health*. 2016;4(7):e453-e463.
3. Sankaramarayanan R, Nene BM, Shastri SS, Jayant K, Muwonge R, Budukh AM, et al. HPV screening for cervical cancer in rural India. *N Engl J Med*. 2009;360(14):1385-1394.
4. Centers for Disease Control and Prevention. HPV vaccination recommendations. Atlanta (GA): CDC; [cited 2026 Jun 17].
5. ICO/IARC Information Centre on HPV and Cancer. Human papillomavirus and related diseases report: India fact sheet. Barcelona: ICO/IARC Information Centre on HPV and Cancer.
6. Pandey D, Vanya V, Bhagat S, Binu VS, Shetty J. Awareness and attitude towards human papillomavirus vaccine among medical students in India. *PLoS One*. 2012;7(7):e40619.
7. Mehta S, Rajaram S, Goel G, Goel N. Awareness about human papillomavirus and its vaccine among medical students. *Indian J Community Med*. 2013;38(2):92-94.
8. Desu SV, et al. Knowledge and awareness of cervical cancer prevention and HPV vaccination among medical and nursing students in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol*. 2023;12(5):1450-1455.
9. Sharma A, Sharma K, Sharma M. Knowledge regarding cervical cancer and HPV vaccine among medical students: a cross-sectional study. *Clin Epidemiol Glob Health*. 2021;9:289-292. doi:10.1016/j.cegh.2020.09.012.
10. Jenitha B, Subbiah M, Revathy S. Knowledge and awareness of cervical cancer, its prevention and attitude towards human papillomavirus vaccine among medical students. *Int J Reprod Contracept Obstet Gynecol*. 2020;9(1):149-154. doi:10.18203/2320-1770.ijrcog20200346.
11. Poonia H, Masand DL. Knowledge, attitude and practice about human papillomavirus vaccination among medical students. *Int J Reprod Contracept Obstet Gynecol*. 2025;14(1):45-50.
12. Theertha SS, Kamath P. Assessment of awareness regarding human papilloma virus vaccine among medical students: a knowledge attitude and practice study. *Int J Reprod Contracept Obstet Gynecol*. 2019;8(5):1842-1846.
13. Kwang NB, Yee CM, Shan LP, Teik CK, Chandrasekaran SK. Knowledge, perception and attitude towards human papillomavirus among pre-university students in Malaysia. *Asian Pac J Cancer Prev*. 2014;15(21):9117-9123.
14. Hoque ME. Awareness of cervical cancer, Pap smear and HPV vaccine among female university students in South Africa. *Asian Pac J Cancer Prev*. 2013;14(10):5703-5710. doi:10.7314/APJCP.2013.14.10.5703.
15. Rashwan HH, Saat NZ, Abd Manan DN. Knowledge, attitude and practice of Malaysian medical and pharmacy students towards human papillomavirus vaccination. *Asian Pac J Cancer Prev*. 2012;13(5):2279-2283. doi:10.7314/APJCP.2012.13.5.2279.
16. Di Giuseppe G, Abbate R, Liguori G, Albano L, Angelillo IF. Human papillomavirus and vaccination: knowledge, attitudes, and behavioural intention in adolescents and young women in Italy. *Br J Cancer*. 2008;99(2):225-229. doi:10.1038/sj.bjc.6604454.
17. Kataria PR, Kalikar MV, Dutta PA, Kataria AR. Knowledge, attitude and practice of HPV vaccination among female undergraduate medical students at a tertiary centre: a cross-sectional study. *Int J Community Med Public Health*. 2025;12(3):1120-1125.
18. Chandila P, Kaur AP, Jyothi. Knowledge, attitude and practice regarding human papillomavirus vaccination among medical students. *Int J Res Med Sci*. 2025;13(2):560-566.

19. Blödt S, Holmberg C, Müller-Nordhorn J, Rieckmann N. Human papillomavirus awareness, vaccine status, and risk factors in female university students: a cross-sectional study. *BMC Womens Health*. 2012;12:34. doi:10.1186/1472-6874-12-34.
20. Kumar P, Malhotra N, Sharma V, et al. Awareness and acceptance of HPV vaccination among medical students in North India. *J Obstet Gynaecol India*. 2017;67(1):42-46. doi:10.1007/s13224-016-0925-5.
21. Dempsey AF, Abraham LM, Dalton V, Ruffin M. Understanding the reasons why mothers do or do not have their adolescent daughters vaccinated against human papillomavirus. *Ann Epidemiol*. 2009;19(8):531-538. doi:10.1016/j.annepidem.2009.03.011.
22. Kwan TTC, Chan KKL, Yip AMW, et al. Acceptability of human papillomavirus vaccination among Chinese women: concerns and implications. *BJOG*. 2009;116(4):501-510. doi:10.1111/j.1471-0528.2008.02041.x.
23. Chauhan S, Tiwari SK, Dubey V, et al. Knowledge, attitude, and reasons for non-uptake of human papilloma virus vaccination among nursing students. *BMC Med*. 2025;23:35. doi:10.1186/s12916-025-03874-w.
24. Singh P, Nikumb V. Knowledge, attitude and practice regarding cervical cancer and HPV vaccination among medical students in India: a cross-sectional study. *Int J Sci Res*. 2024;13(10):373-376.
25. Laz TH, Rahman M, Berenson AB. HPV vaccine uptake and predictors. *Hum Vaccin Immunother*. 2013;9(4):874-878.