International Journal of Community Medicine and Public Health
Dhargawe, PP et al. Int J Community Med Public Health. 2025 Jun;12(6):2737-2742
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20251720

Original Research Article

Knowledge, attitude and practice on "human papilloma virus vaccination" among male medical undergraduate and postgraduate students in a tertiary care teaching centre: an observational and cross-sectional study

Purvastha P. Dhargawe, Mrunalini Kalikar*, Neha Meshram, Shivaji Dhande

Department of Pharmacology, Government Medical College, Nagpur, Maharashtra, India

Received: 31 March 2025
Revised: 25 May 2025
Accepted: 26 May 2025

***Correspondence:**
Dr. Mrunalini Kalikar,
E-mail: mrunalinikalikar@yahoo.com

ABSTRACT

Background: Human papillomavirus (HPV) is a significant health risk for males, yet awareness and vaccination rates remain low. This study aims to assess the knowledge, attitude and practice levels regarding HPV and its vaccination among male medical students.
Methods: We conducted a cross-sectional study using a structured, pre-tested questionnaire among 165 male medical students in a tertiary care centre in Central India. Data were analysed using descriptive statistics and un-paired 't' tests.
Results: The study identified significant gaps in knowledge about HPV vaccinations. Only 34.8% of respondents answered correctly on average to questions about HPV vaccines, though 81.4% recognized the need for vaccination. The overall attitude towards HPV vaccination was positive, with 73.4% expressing confidence in vaccine safety and efficacy.
Conclusions: Despite a generally positive attitude towards HPV vaccination, knowledge among medical students remains inadequate in certain areas. Despite knowing about the vaccine, uptake was low, illustrating the "knowledge-practice gap" in healthcare. Increased educational efforts are recommended to improve knowledge and uptake of HPV vaccination.

Keywords: Attitude, HPV vaccination, Knowledge, Male medical students, Practice

INTRODUCTION

Human papilloma virus (HPV) infection is the most common sexually transmitted infection worldwide in males and females. While the role of HPV in female diseases is well known and largely studied, males have negligibly been included in these programs.[1] It has been found that HPV infection in males is associated with neoplastic diseases like penile cancer, oropharyngeal squamous cell carcinoma (OPSCC), Anal Cancer as well as with non-neoplastic diseases like recurrent respiratory papillomatosis (RRP), genital warts, male infertility etc.[1] There is a high detection rate in sexually active young people but the risk, in males, persists over years.[2] Evidence shows that persistent HPV infection is a significant risk factor for malignancies.

Biomarkers that can predict the fate of HPV infections are not available. Therefore, prevention of the infection and disease can be done by HPV vaccination.[3] Being part of effective preventive strategies for HPV induced health problems, HPV vaccine can prevent most cases of HPV

infections if it is given before men are exposed to the virus.[4] However, in spite of safe formulation and proven effectiveness of immunization regimes, HPV vaccination is not incorporated in the National Immunization Program of India, primarily due to financial concerns.[4] Healthcare specialists play an essential role in creating awareness regarding screening methods and vaccination, thereby assisting individuals and communities to overcome the socio-cultural, religious and ethical stigmas related with them.

However, lack of updated knowledge among healthcare professionals poses a hurdle in creating awareness about accessing various HPV control services.[3] It is imperative to include information and create understanding regarding HPV in the early phases of training of male medical students, to ensure appropriate shaping of knowledge and competency to deal with HPV related health services, as future healthcare workers.[5]

A very few studies have reported knowledge and awareness regarding HPV vaccination in males in Indian context and there is paucity of data regarding the same. Hence, this study is being planned with the objective to assess knowledge, attitude and practice of HPV vaccination in male undergraduate and postgraduate medical students in a tertiary care teaching centre.

METHODS

This cross-sectional study was undertaken at a tertiary healthcare institute in Central India during August and September 2024. Includes male undergraduate and postgraduate medical students aged 18 to 30 years who provided informed consent. Participants who declined to consent or could not complete the questionnaire were excluded. The study received approval from the Institutional Ethics Committee (Letter No.EC/Pharmac/GMC/NGP/no.3572-Dt.13/09/24).

Data were collected using a pre-designed, validated questionnaire distributed via Google Forms, covering sociodemographic characteristics and KAP regarding HPV vaccination. The questionnaire, validated by 10 experts in the field, consisted of 28 questions, both open and closed-ended, focusing on various aspects of HPV and associated vaccines. Participant confidentiality was maintained as no names were recorded. Statistical analysis involved descriptive statistics and an un-paired ‘t' test to assess the relationship between categorical variable, performed using MS Excel. A p value less than 0.05 was considered statistically significant.

RESULTS

General characteristics of participants

Out of a total 165 participants, 93 (56.4%) were undergraduates and 72 (43.6%) were postgraduates. All participants were in the age range of 18 to 30 years. The mean age of participants was 24.29±5.078 (SD). Table 1 illustrates academic levels of participants.

Knowledge of participants about HPV and HPV vaccine

Table 2 describes the knowledge of participants about HPV and HPV vaccine. The participants were well aware that HPV was responsible for causing sexually transmitted infections (93.5%).

They were moderately (59.9%) knowledgeable about the cancers caused by HPV in males. Also, the present study observed inadequacies in the knowledge about the oncogenic variants of HPV in males (52.7%).

Regarding the HPV vaccine, the participants were not adequately aware about the availability of a vaccine against HPV for males in India (21%).

Although, modest number of participants were aware about the routes and dose of HPV vaccine administration in India (52.7%), there were gaps in knowledge regarding the appropriate age for HPV vaccination (23.4%), the exact variation in number of doses below (24%) and above the age of 15 (31.1%); as well as its administration in people living with HIV (PLWH) (35.9%) (Table 2).

The p value ($p<0.05$) for the mean score of correct answers among undergraduates and postgraduates (Table 3) indicates a statistically significant difference, with postgraduate students demonstrating significantly higher knowledge than undergraduates.

Attitudes of participants towards HPV vaccine

Table 4 delineates the attitude of participants towards HPV vaccine. 73.1% believed that the HPV vaccine was safe and effective.

Although only a minor percentage of participants (18.6%), rejected the vaccine due to fear of side-effects, majority of them (75.4%) were willing to recommend the vaccine to male members of their family and (81.4%) felt the need to get vaccinated themselves. (Table 4).

Practice of HPV vaccine and underlying reasons

In the present study, only 10% of participants were immunized for HPV (Table 5). The reason for such poor coverage of vaccination was cited as ‘lack of knowledge about HPV vaccines’ (73.4%) by maximum participants.

Other reasons cited were, that the vaccine was unnecessary (14.3%), a lack of trust (7.2%), unsuitability of vaccine (9.7%) and its high cost (38.3%) (Table 6).

Table 1: Academic level of study participants (n=165).

Academic year	Number of participants (%)	Mean age of participants (Mean±SD)
Undergraduates	93 (56.4%)	24.29±5.078
Residents	72 (43.6%)	
Total	165 (100%)	

Table 2: Knowledge of participants Regarding HPV and HPV vaccine (n=167).

S. no.	Question	Number of Participants (%)	
		With correct answer	With incorrect answer
1.	Do you know that HPV is responsible for causing sexually transmitted infections?	156 (93.4)	09 (3.6)
2.	What are the HPV related diseases in males?	106 (63.5)	59 (36.5)
3.	Which of the following cancers are caused by HPV in males?	100 (59.9)	65 (40.1)
4.	What are the high-risk carcinogenic HPV types?	88 (52.7)	77 (40.1)
5.	How can we prevent HPV infections?	118 (70.7)	47 (29.3)
6.	Is HPV vaccine included in National Immunization Schedule of India?	70 (41.9)	97 (58.1)
7.	What vaccine is available in India against HPV for males?	35 (21)	130 (79)
8.	What is the recommended age in males to get the HPV vaccine?	39 (23.4)	126 (76.6)
9.	What is the recommended route and dose of HPV vaccine administration in India?	88 (52.7)	77 (40.1)
10.	Does the number of doses of HPV vaccine required, depends on age?	81 (48.5)	84 (51.5)
11.	What are the number of doses of HPV vaccine, required in males below 15 years?	40 (24)	125 (76)
12.	What are the number of doses of HPV vaccine, required in males above 15 years?	52 (31.1)	113 (68.9)
13.	Can we administer HPV vaccine in people living with HIV infection (PLWH)?	60 (35.9)	105 (64.1)

Table 3: Knowledge of participants regarding HPV and HPV vaccination in males (n=165).

	Undergraduates (n=93)	Postgraduate (n=72)	P value
Mean score (Mean±SD)	36.92±23.30	41.38±13.29	0.0001

Table 4: Attitudes of participants regarding vaccination against HPV in males (n=165).

S. no.	Question	Responses		
		Yes (%)	No (%)	Do not know (%)
1.	Do you agree that HPV vaccine is important for protection against cancers in males?	123 (73.1)	37 (22.2)	6 (4.7)
2.	Is HPV vaccine as similarly important as other vaccines??	129 (77.2)	9 (5.4)	27 (17.4)
3.	Do you feel the need to get vaccinated against HPV?	136 (81.4)	19 (18.6)	NA
4.	Do you reject the vaccine due to fear of side effects?	31 (18.6)	102 (61.1)	32 (20.4)
5.	Do you believe that HPV vaccines are safe and effective?	122 (73.1)	7 (4.2)	36 (22.8)
6.	Would you recommend administration of HPV vaccines in the male members of your family?	126 (75.4)	9 (5.4)	30 (19.2)
7.	Do you think increasing awareness about HPV and associated diseases will increase the rate of vaccination amongst males?	145 (86.8)	7 (4.2)	13 (9)
8.	Do you think parental attitude have any role in HPV vaccination in males?	128 (76.6)	15 (9)	24 (14.4)

NA: Not applicable.

Table 5: Practice of HPV vaccination (n=165).

Number of participants (%)	
Vaccinated against HPV	**Not vaccinated against HPV**
20 (12.1)	145 (87.8)

Table 6: Concerns among participants (n=165).

Reasons for not getting vaccinated	Number of participants (%)
High cost	59 (38.3)
Unnecessary	22 (14.3)
Unsuitable	15 (9.7)
Lack of knowledge	113 (73.4)
Lack of trust	29 (18.8)

DISCUSSION

India contributes majorly to the global burden of HPV and related infections like cervical carcinoma and oropharyngeal cancer. Therefore, it is indispensable to identify the current knowledge, attitude and practice of healthcare professionals including medical students about HPV and its prevention strategies to translate it into actionable policymaking that will contribute towards the welfare of the population in the future. Considering this, the current study was carried out primarily to evaluate knowledge, attitude and practices among male medical students about HPV.

According to the Advisory Committee on Vaccines and Immunization Practices (ACVIP) of Indian Academy of Paediatrics (IAP) HPV vaccine i.e., 9v Gardasil vaccine is recommended for routine vaccination at age 9-14 years in boys and 4v Cervavac vaccine in males till age 26 years if not adequately vaccinated when younger.[3] Vaccination is not recommended for everyone older than age 26 years.[3] Two doses of HPV vaccine are recommended for most persons starting the series before the age of 15. The second dose of HPV vaccine should be given 6 to 12 months after the first dose. Three doses of HPV vaccine are recommended for teens and young adults who start the series at ages 15 through 26 years and for immunocompromised persons.[3] The recommended three-dose schedule is 0, 1–2 and 6 months.

In this study, the assessment of knowledge regarding the HPV vaccine revealed that a moderate proportion of participants (59.9%) were aware of the causal relationship between HPV and oropharyngeal cancers in men. A previous study by Kalikar et al, on female medical undergraduates, showed that a higher percentage (95.3%) recognized the neoplastic effects of HPV. Participants in the current study demonstrated good knowledge of the asymptomatic nature of HPV infection, its role in causing genital warts and the route and mechanism of infection.[6] However, certain gaps in knowledge were identified, particularly regarding high-risk carcinogenic HPV variants and their association with non-neoplastic diseases in males. Awareness of the availability of the HPV vaccine for males in India was notably low (21%), as was knowledge about its inclusion in the National Immunization Schedule (41.9%). These findings differ from those of Kalikar et al, where female medical undergraduates showed greater awareness of the vaccine's availability.[6]

Additionally, significant gaps were observed in participants' understanding of the age-dependent variability in the number of vaccine doses. Alarmingly, knowledge about the appropriate age for HPV vaccination, the required number of doses for individuals above and below 15 years and the upper age limit for vaccine administration was found to be particularly poor.

Regarding attitudes toward vaccination, the majority of participants (73.1%) recognized the importance of the HPV vaccine in protecting against cancers in men. A small proportion (4.2%) expressed concerns about its safety and efficacy, while 18.6% hesitated due to fears of side effects. These findings align with the study by Sadiqunissa et al, where most participants believed the vaccine to be safe and effective.[7]

Additionally, a significant majority (86.8%) believed that increasing awareness about HPV and its associated diseases would improve vaccination rates among males. Furthermore, 76.6% of participants acknowledged the influential role of parental attitudes in vaccinating young males. This observation is consistent with a systematic review by Down M. Holman et al., which highlighted the critical role of educating parents and healthcare professionals in promoting HPV vaccination for the prevention of HPV-related cancers in young males.[8]

Although a significant majority of participants (81.4%) recognized the need for HPV vaccination, the percentage of participants actually vaccinated was alarmingly very low (10%). This highlights the classic gap between awareness and practice where "knowing is half the battle," but translating knowledge into practice remains a challenge. A study by Durusoy et al, in Western Turkey

reported a striking contrast, finding that knowledge among students was severely lacking, with only 11.6% expressing willingness to be vaccinated. This suggests that while awareness levels may vary across populations, vaccination hesitancy remains a common roadblock.[9]

One of the key reasons HPV infections often flies under the radar is its asymptomatic nature, allowing nearly 90% of cases to resolve without treatment.[1] This silent progression makes prevention through vaccination all the more crucial arguably one of the greatest breakthroughs in modern medicine. The introduction of the HPV vaccine marks a significant stride in the fight against oropharyngeal cancer in men. However, while pharmaceutical companies have aggressively marketed the vaccine, emphasizing its role beyond cervical cancer to include oropharyngeal cancers, genital warts and respiratory papillomatosis, public awareness remains far from ideal.[10]

Misconceptions continue to cloud public perception, leaving many hesitant. The present study reflects this reality, as only 10% of participants were vaccinated, with the majority (73.4%) citing a lack of awareness and (38.3%) mentioning the high cost as barriers to vaccination. These findings align with a study by Claire Stanley et al, which revealed that even among male physicians, 81% remained unvaccinated reinforcing the notion that knowledge alone does not always translate into proactive health decisions.[11]

Our study revealed a paradox while knowledge about HPV vaccination improved progressively with each academic year of medical education, the translation of this knowledge into practice remained dismal. This underscores the classic case of "the left hand not knowing what the right hand is doing," where increasing awareness has not necessarily led to increased vaccination rates among male medical students.[10] This disconnect highlights the urgent need for not just education but also strong motivation and systemic changes to bridge the gap between knowledge and action.[1]

The lack of adequate knowledge about HPV and its associated health risks among medical students is merely the tip of the iceberg what lies beneath the surface is likely a vast ocean of misinformation and misconceptions within the general public.[1] If even future healthcare professionals display gaps in understanding, the situation among the lay population could be significantly worse, potentially leading to a ticking time bomb in terms of public health.[1]

The global acceptance of the HPV vaccine holds the promise of turning the tide against HPV-related cancers, significantly reducing morbidity and mortality associated with cervical and other malignancies.[5] However, this can only be achieved if prevention takes precedence over cure, which calls for aggressive health education programs, well-structured awareness campaigns and an emphasis on adolescent vaccination to nip the problem in the bud. Pharmaceutical companies also have a crucial role to play beyond mere profit-making. By integrating robust Corporate Social Responsibility (CSR) initiatives into their business model, they can proactively contribute to raising awareness, dispelling myths and fostering a culture where HPV vaccination is seen as a preventive necessity rather than an optional intervention.[5]

Furthermore, medical students must move beyond passive learning and engage in hands-on, proactive participation in conferences, workshops and interactive forums. These platforms should serve as arenas to clear the fog surrounding HPV's role in oropharyngeal, penile and anal cancers in males.[10] By embracing such initiatives, future doctors can not only enhance their own understanding but also act as catalysts in turning knowledge into action within the broader community. However, one limitation of the present study is that it was conducted at a single tertiary care centre, which may limit the generalizability of the findings to other medical institutions and regions.

CONCLUSION

Participants showed an understanding of HPV diseases and recognized prevention's importance but still had significant knowledge gaps, particularly regarding vaccination age and dose requirements. Despite knowing about the vaccine, uptake was low, illustrating the "knowledge-practice gap" in healthcare. This emphasizes the need for targeted educational initiatives for medical professionals and the wider community. Including the HPV vaccine in the National Immunization Schedule and implementing subsidized pricing could improve vaccination rates and reduce HPV-related health issues.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Garolla A, Graziani A, Grande G, Maretti C, Pelloni M, Pizzol D, et al. HPV-related diseases in male patients: an underestimated conundrum. J Endocrinol Invest. 2023;47(2):261–74.
2. Ramamoorthy T, Sathishkumar K, Das P, Srinivasan R, Ganesan TS, Vinayak K, et al. Epidemiology of human papillomavirus related cancers in India: findings from the National Cancer Registry Programme. Ecancermedicalscience. 2022;16:89.
3. Rao MIS, Kasi SG, Dhir SK, Gupta M, Sharma S, Sahu M, et al. Indian Academy of Pediatrics (IAP) Advisory Committee on Vaccines and Immunization Practices (ACVIP): Recommended Immunization Schedule (2023) and update on immunization for children aged 0 through 18 years. Indian Pediatr. 2024;61(2):113–25.

4. Khamisy-Farah R, Adawi M, Jeries-Ghantous H, Muallem Y, Elkhatib I, Aboud T, et al. Knowledge of human papillomavirus (HPV), attitudes and practices towards anti-HPV vaccination among Israeli pediatricians, gynecologists and internal medicine doctors: development and validation of an ad hoc questionnaire. Vaccines (Basel). 2019;7(4):157.
5. Aggarwal S, Agarwal P, Singh AK. Human papilloma virus vaccines: a comprehensive narrative review. Cancer Treat Res Commun. 2023;37(1):100780.
6. 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(4):1787–92.
7. Radhika MS, Sadiqunissa, Sharma S, Banu H. Awareness and knowledge of human papilloma virus (HPV) vaccine in prevention of cervical cancer among medical students. Int J Reprod Contracept Obstet Gynecol. 2018;7:5026–30.
8. Holman DM, Benard V, Roland KB, Watson M, Liddon N, Stokley S, et al. Barriers to human papillomavirus vaccination among US adolescents: a systematic review of the literature. JAMA Pediatr. 2014;168(1):76–82.
9. Durusoy R, Yamazhan M, Taşbakan MI, Ergin I, Akin A, Karavus M, et al. HPV vaccine awareness and willingness of first-year students entering university in western Turkey. Asian Pac J Cancer Prev. 2010;11(5):1695–701.
10. Fuller KM, Hinyard L. Factors associated with HPV vaccination in young males. J Community Health. 2017;42(6):1127–32.
11. Stanley C, Secter M, Chauvin S, Gagnon D, Charlebois J, Dionne A, et al. HPV vaccination in male physicians: a survey of gynecologists and otolaryngology surgeons' attitudes towards vaccination in themselves and their patients. Papillomavirus Res. 2018;5:89–95.
12. Lingam AS, Koppolu P, Alhussein SA, Gad MM, Alotaibi WH, Alghamdi AS, et al. Dental students' perception, awareness and knowledge about HPV infection, vaccine and its association with oral cancer: a multinational study. Infect Drug Resist. 2022;15:3711–24.
13. Pal D, Sahoo B, Taywade M, Dey B, Sinha M, Choudhury A, et al. Evidence of knowledge, attitude and practice regarding human papilloma virus vaccination at the community level in India: a systematic review and meta-analysis. Asian Pac J Cancer Prev. 2024;25(3):793–800.
14. Pitts M, Smith A, Croy S, Lyons A, Mitchell A, Garland S. Singaporean men's knowledge of cervical cancer and human papillomavirus (HPV) and their attitudes towards HPV vaccination. Vaccine. 2009;27(22):2989–93.
15. Napolitano F, Napolitano P, Liguori G, Angelillo IF, Di Giuseppe G, D'Errico MP, et al. Human papillomavirus infection and vaccination: knowledge and attitudes among young males in Italy. Hum Vaccin Immunother. 2016;12(6):1504–10.
16. Khamisy-Farah R, Endrawis M, Odeh M, Jarrar Y, Khatib W, Salman Y, et al. Knowledge of human papillomavirus (HPV), attitudes and practices towards anti-HPV vaccination among Israeli nurses. J Cancer Educ. 2023;38(4):1391–6.
17. Albayat SS, Mundodan JM, Elmardi K, Joseph M, Alhumaidi M, AlHarthy A, et al. Knowledge, attitude and practices regarding human papilloma virus vaccination among physicians in Qatar. Womens Health (Lond Engl). 2024;3:35.
18. Awan UA, Naeem W, Khattak AA, Saeed K, Qazi S, Rehman N, et al. An exploratory study of knowledge, attitudes and practices toward HPV associated anal cancer among Pakistani population. Front Oncol. 2023;13:64.
19. Sharma H, Anil K, Parekh S, Jadhav S, Kulkarni PS, Tewari T, et al. A phase-I, open label clinical trial to assess the safety and tolerability of qHPV vaccine manufactured by Serum Institute of India Pvt. Ltd. in adults. Vaccine X. 2023;14(10):100313.
20. Cooper DL, Hernandez ND, Rollins L, Akintobi TH, Goodin K, Blumenthal DS, et al. HPV vaccine awareness and the association of trust in cancer information from physicians among males. Vaccine. 2017;35(20):2661–7.
21. D'Errico MP, Tung WC, Lu M, Gropper SS, Kline NE, Spencer N, et al. Knowledge, attitudes and practices related to human papillomavirus vaccination among college students in a state university: implications for nurse practitioners. J Am Assoc Nurse Pract. 2021;33(9):709–18.
22. Farsi NJ, Baharoon AH, Jiffri AE, Alharbi M, Alabbasi A, Alzahrani T, et al. Human papillomavirus knowledge and vaccine acceptability among male medical students in Saudi Arabia. Hum Vaccin Immunother. 2021;17(7):1968–74.

Cite this article as: Dhargawe PP, Kalikar M, Meshram N, Dhande S. Knowledge, attitude and practice on "human papilloma virus vaccination" among male medical undergraduate and postgraduate students in a tertiary care teaching centre: an observational and cross-sectional study. Int J Community Med Public Health 2025;12:2737-42.