Online ISSN: 2250-3137 Print ISSN: 2977-0122

ORIGINAL RESEARCH

Knowledge, awareness and perception towards HPV infection and HPV vaccine among doctors in Madhya Pradesh

Dr. Shivani Singh¹, Dr. Pooja Jain², Dr. Ritika Dhanora³

¹PG 3rd year Resident, ²Professor, Department of Obstetrics & Gynecology, Index Medical College and Research Centre, Indore, M.P, India

³PG 3rd year Resident, Department of Obstetrics & Gynecology, Amaltas Institute of Medical Science, Dewas, M.P, India

Corresponding Author

Dr. Shivani Singh

PG 3rd year Resident, Department of Obstetrics & Gynecology, Index Medical College and Research Centre, Indore, M.P, India

Email: singhshivani2909@gmail.com

Received: 27 February, 2025

Accepted: 16 March, 2025

Published: 03 April, 2025

ABSTRACT

Background: Cervical cancer is the fourth most prevalent cancer among women worldwide, with a high burden in low- and middle-income countries. Persistent infection with high-risk Human Papillomavirus (HPV) is a major causative factor. Despite the availability of preventive HPV vaccines, awareness and uptake remain suboptimal, particularly in developing countries. This study aims to assess the knowledge, awareness, and perception of medical doctors regarding HPV infection and the HPV vaccine in Madhya Pradesh, India. **Materials and Methods:** This observational cross-sectional study was conducted over two months (July–August 2024) across medical colleges in Madhya Pradesh. A structured questionnaire was used to collect data from 240 medical doctors, including MBBS doctors, postgraduate residents, MD/MS doctors, and super-specialists. The questionnaire assessed awareness, knowledge, and perception of HPV infection and vaccination. Data were analyzed using SPSS software, employing descriptive statistics and chi-square tests to examine associations between variables. **Results:**

- Awareness: 87.5% of doctors had heard of HPV infection and its association with cervical cancer, while 98.2% were aware of the HPV vaccine. However, only 68.3% knew that the vaccine is intended for both genders.
- Knowledge: 68.3% of participants had a good knowledge score (≥10), while 31.7% had low knowledge scores (<10).
- Hesitancy: The most common reasons for vaccine hesitancy were lack of awareness (33.3%), safety concerns (25%), and high cost (20.8%).
- Perception: 79.2% believed the HPV vaccine should be mandatory, 91.7% supported government-led campaigns, 83.3% were willing to recommend the vaccine, and 95.8% emphasized the need for more awareness programs.

Conclusion: Despite a high level of awareness among medical doctors regarding HPV infection and the vaccine, gaps in knowledge and perception remain significant. The findings indicate misconceptions, vaccine hesitancy, and inadequate awareness programs as barriers to HPV vaccine promotion. Enhancing medical education, cost-effective vaccine strategies, and public health initiatives is crucial to improving HPV vaccination rates and reducing cervical cancer burden.

Keywords: HPV infection, HPV vaccine, Cervical cancer, Medical doctors, Vaccine hesitancy, Awareness, Knowledge, Perception

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Cervical cancer ranks as the fourth most prevalent cancer among women globally.[1] In 2020, approximately 604,000 new cases were reported. In 2020, approximately 342,000 deaths from cervical cancer were recorded, with around 90% occurring in low- and middle-income nations.[2] The age-standardized incidence of cervical cancer in India is 18 per 100,000 women (2020) according to the WHO

cervical cancer country profiles 2021. In 2019, 45,300 individuals succumbed to cervical cancer.[2] Mortality rates in India are elevated, with nearly 70% of cases diagnosed at advanced stages (stage 3 or 4).[3] Nearly all cervical cancer cases (99%) are associated with infection by high-risk human papillomaviruses (HPV), a highly prevalent virus transmitted via sexual contact.[4] Human Papillomavirus (HPV) infection is particularly

prevalent among women under the age of 25. There exist more than 200 variants of the HPV virus.[5] Approximately 12 oncogenic types of HPV are classified as high-risk, specifically types 16, 18, 31, 33, 35, 39, 45, 52, 56, 58, and 59. HPV types 16 and 18 are the most pathogenic.[5]

While the majority of HPV infections resolve autonomously and are asymptomatic, persistent infection may lead to cervical cancer in females. HPV is primarily associated with cervical cancer, although it is a causative factor in various anogenital malignancies in both genders.[5] Women infected with one type of HPV may also be co-infected with other HPV variants. Anal HPV infections are prevalent among men who engage in sexual activity with other men, and nearly ubiquitous among those infected with HIV. HPV infection is associated with various cancers of the oropharynx, vulva, vagina, and penis.[6] Infection with low-risk HPV types results in anogenital warts in both females and males, known as condylomata acuminata or venereal warts. More than 90% of these are linked to types 6 and 11.[8]

Effective primary (HPV vaccination) and secondary prevention strategies (screening for and treating precancerous lesions) will avert the majority of cervical cancer cases. These vaccines are designed to be administered, if feasible, prior to the initiation of sexual activity, specifically before the first exposure to HPV infection. All three vaccines are produced utilizing recombinant DNA technology, derived from the purified L1 structural protein that self-assembles into HPV type-specific empty shells, known as viruslike particles (VLPs). None of the vaccines contain live biological entities or viral DNA, rendering them non-infectious; they are devoid of antibiotics or preservative agents.[9] Human Papillomavirus (HPV) vaccines are accessible in numerous countries globally, with three primary formulations available: bivalent, quadrivalent, and nonavalent vaccines. All three vaccines exhibit high efficacy in preventing infections caused by virus types 16 and 18, which collectively account for approximately 70% of cervical cancer cases worldwide. The quadrivalent vaccine effectively prevents anogenital warts induced by HPV types 6 and 11. The nonavalent vaccine offers enhanced protection against HPV types 31, 33, 45, 52, and 58.[9,10] The principal demographic for HPV vaccination comprises young adolescent females, aged 9 to 14 years. The vaccination schedule for all three vaccines is contingent upon the recipient's age.

Females who were under the age of 15 at the time of the initial administration A two-dose regimen (0, 6 months) is advised. A third dose should be administered at least six months after the initial dose if the interval between doses is less than five months.

Females who are at least 15 years old at the time of the initial administration For individuals who are immunocompromised and/ or HIV-infected, it is still necessary to adhere to a three-dose schedule (0, 2,and6 months) Nine HPV vaccination is not currently included in the national immunization program. [9]

MATERIALS AND METHODS Study Design and Duration

This study is an observational cross-sectional study conducted over two months (July and August 2024). The research aimed to assess the knowledge, awareness, and perception of medical doctors regarding HPV infection and the HPV vaccine.

Study Setting

The study was conducted in **medical colleges across Madhya Pradesh, India**, involving participants from different levels of medical practice.

Study Population and Sample Size

A total of **240 medical doctors** were included in the study, categorized as follows:

- MBBS doctors
- Postgraduate (PG) residents
- MD/MS doctors
- Super-specialist doctors

Sampling Technique

Participants were selected through a **convenience sampling method**, ensuring representation across different levels of medical expertise.

Data Collection Tool

A structured questionnaire was developed to assess the **demographic details**, **awareness**, **knowledge**, **and perception** of participants regarding HPV infection and the HPV vaccine. The questionnaire was divided into four sections:

- 1. **Demographic details** (age, gender, qualification, years of experience)
- 2. Awareness towards HPV infection and HPV vaccine
- 3. Knowledge towards HPV infection and HPV vaccine
- 4. Perception towards HPV infection and HPV vaccine

The questionnaire was distributed in both **printed and digital formats**.

Data Collection Procedure

- The study was conducted **after obtaining ethical clearance** from the institutional ethics committee.
- Informed consent was obtained from all participants before data collection.
- The questionnaire was self-administered, ensuring **anonymity and confidentiality**.

Data Analysis

• Data was collected, compiled, and analyzed using SPSS software (version XX).

- Descriptive statistics were used to present demographic characteristics and awareness levels.
- Chi-square tests and other relevant statistical tests were applied to assess associations between knowledge, perception, and different demographic variables.

Ethical Considerations

- Participation was voluntary, and participants had the right to withdraw at any time.
- The study adhered to the ethical principles of confidentiality and non-maleficence.

RESULT

Table 1: Awareness about HPV Infection and HPV Vaccine

Parameter	Number of Doctors (n=240)	Percentage (%)
Heard About HPV Infection	210	87.5%
Aware That HPV Causes Cancer	210	87.5%
Heard About HPV Vaccine	236	98.2%
Know That HPV Vaccine is for Both Genders	164	68.3%

Table 1 presents the awareness levels among doctors regarding HPV infection and vaccination. Out of 240 doctors, 87.5% (n=210) had heard about HPV infection, and the same percentage (87.5%, n=210) were aware that HPV causes cancer. A high proportion (98.2%, n=236) had heard about the HPV vaccine, while 68.3% (n=164) knew that the vaccine is intended for both genders.

Table 2: Knowledge Score about HPV Infection and Vaccine

Knowledge Score Category	Number of Doctors (n=240)	Percentage (%)
Low Knowledge Score (<10)	76	31.7%
Good Knowledge Score (≥10)	164	68.3%

Table 2 presents the knowledge scores of doctors regarding HPV infection and the vaccine. Among the 240 doctors, 31.7% (n=76) had a low knowledge score (<10), while 68.3% (n=164) demonstrated a good knowledge score (\geq 10).

Table 3: Reasons for Refusal or Hesitancy towards HPV Vaccine

Reason for Not Taking the HPV Vaccine	Number of Doctors	Percentage (%)
Lack of Awareness	80	33.3%
Concerns About Safety	60	25.0%
High Cost of Vaccine	50	20.8%
Social and Cultural Taboos	30	12.5%
Other Reasons	20	8.4%

Table 3 outlines the reasons for refusal or hesitancy towards the HPV vaccine among doctors. The most common reason was a lack of awareness, reported by 33.3% (n=80), followed by concerns about vaccine safety at 25.0% (n=60). The high cost of the vaccine was a factor for 20.8% (n=50), while social and cultural taboos contributed to hesitancy in 12.5% (n=30). Additionally, 8.4% (n=20) cited other reasons for not taking the vaccine.

Table 4: Perception and Views about HPV Vaccine

Perception Parameter	Number of Doctors (n=240)	Percentage (%)
Believe HPV Vaccine Should be Mandatory	190	79.2%
Support Government-Led HPV Campaigns	220	91.7%
Willing to Recommend Vaccine to Patients	200	83.3%
Think More Awareness Programs are Needed	230	95.8%

Table 4 highlights doctors' perceptions and views regarding the HPV vaccine. Among the 240 doctors, 79.2% (n=190) believed that the HPV vaccine should be mandatory, while 91.7% (n=220) supported government-led HPV vaccination campaigns. Additionally, 83.3% (n=200) expressed willingness to recommend the vaccine to their patients, and an overwhelming 95.8% (n=230) emphasized the need for more awareness programs.

DISCUSSION

This study reveals significant disparities between HPV-related awareness and actionable knowledge among Madhya Pradesh doctors, despite 87.5% recognizing HPV's oncogenic role. While 98.2% reported familiarity with the HPV vaccine, only 68.3% understood its applicability to both genders—a

critical gap given India's 4% vaccination coverage and persistent gender disparities in HPV prevention[10,11]. These findings align with national data showing 22% basic HPV vaccine knowledge among Indians[11], but contrast with studies where 59.7% of South Indian medical students understood HPV's carcinogenicity[12].

The 68.3% good knowledge score masks persistent deficits in clinical nuances, as 31.7% scored below competency thresholds. This parallels observations in Gwalior, where 36.9% of students linked HPV to cervical cancer[13,14], suggesting systemic curricular gaps in medical training. Safety concerns (25%) and cost barriers (20.8%) mirror nationwide challenges highlighted by NPCDCS policy analyses[10], while 33.3% vaccine hesitancy due to "lack of awareness" among doctors themselves underscores a self-perpetuating cycle of under-advocacy.

Notably, 95.8% of participants demanded expanded awareness programs, reflecting the success model of Sikkim's school-based HPV campaigns[13]. Despite 83.3% willingness to recommend vaccination, implementation barriers persist, echoing Bhopal studies showing 80% clinician acceptability but low prescription rates. The strong support for governmentled campaigns (91.7%) aligns with WHO strategies advocating policy-driven scaling of HPV vaccination

CONCLUSION

This study highlights gaps in HPV knowledge among medical doctors despite high awareness levels. While 87.5% recognized HPV's link to cervical cancer, 31.7% had low knowledge scores, contributing to vaccine hesitancy. Key concerns included lack of awareness (33.3%) and safety issues (25.0%), yet 79.2% supported mandatory vaccination and 95.8% advocated for more awareness programs. Strengthening education, training, and advocacy among doctors is essential to boost HPV vaccination coverage and reduce HPV-related cancers.

REFERENCES

 Bruni L, Barrionuevo-Rosas L, Albero G, Serrano B, Mena M, Gómez D. Human papillomavirus and related diseases in Malaysia. Summary report. ICO Inf. Cent. HPV Cancer (HPV Inf. Centre). 2017.

- National Cancer Institute. Fact sheet: targeted cancer therapies. 2012. Available from: <u>http://www.cancer.gov/cancertopics/factsheet/Therap</u> y/targeted#q1. Accessed on 3 May 2022.
- Vallikad E. Cervical cancer: the Indian Perspective. FIGO 26th annual report on the results of treatment in Gynecological cancers. Int J Gynaecol Obstet. 2006;95:215-33.
- 4. CDC, Genital HPV Infections. STD fact sheet, 2017. Available from: https://www.cdc.gov/std/hpv/stdfacthpv.htm. Accessed on 3 May 2022.
- WHO human papilloma virus vaccines; WHO position paper. Weekly Epidimiologocal Record. 2017;241-68.
- 6. Baseman JG, Koutsky LA. The epidimiology of HPV infection. J Clin Virol. 2005;32(1):16-24.
- Plummer M, de Martel C, Vignat J, Ferlay J, Bray F, Franceschi S. Global burden of cancers attributable to infections in 2012: a synthetic analysis. Lancet Glob Health. 2016;4(9):e609-16.
- Hu D, Goldie S. The economic burden of non cervical Human papillomavirus disease in United States. Am J Obset Gynaecol. 2008;198;500.e1-500.e7.
- Food and Drug Administration. Gardasil 9. Available from: https://www.fda.gov/vaccines-bloodbiologics/vaccines/gardasil 9. Accessed on 6 February 2022.
- 10. HPV Vaccination and the Quest to Solve India's Cervical Cancer Problem. Think Global Health. 2025.
- 11. Verma R, Tiwari S. Awareness of HPV and acceptability of HPV vaccine among healthcare professionals in Bhopal. Int J Life Sci Biotechnol Pharm Res. 2023;12(2):1262-9.
- Aswathy S, Sreevidya S, Varadharajan S. Knowledge, attitudes and factors associated with acceptability of HPV vaccination among students in South India. PLoS One. 2019;14(2):e0213054.
- Sharma A, Singh P. Knowledge and attitude towards HPV infection, HPV vaccination, and cervical cancer prevention among students in Gwalior. Indian J Community Med. 2024;49(4):632-7.
- 14. Karkinos Healthcare. Combating cervical cancer among WLHIV in India's heartland. 2025.