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A Cross-Sectional Study of Knowledge, Attitude and Practice Regarding HPV Vaccination Among Medical Doctors at a Tertiary Care Institute in a City of North-Western Rajasthan

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Abstract: ***Background**: Human Papillomavirus (HPV) is a major cause of cervical cancer, which is the second leading cause of female cancer in India. Although effective HPV vaccines are available, their uptake in India is low. Healthcare providers play a critical role in promoting vaccination, and their knowledge, attitude, and practice (KAP) are key factors in the success of any vaccination program. This study aimed to evaluate the KAP regarding HPV vaccination among medical doctors at a tertiary care institute in North-Western Rajasthan. **Methods**: This was a hospital based cross-sectional survey conducted from April to July 2025. The study population consisted of medical doctors (minimum qualification MBBS and above) at Sardar Patel Medical College and associated P.B.M. Hospitals in Bikaner. A total of 520 doctors participated in the study. A predesigned questionnaire was used to collect data on socio-demographics, knowledge, attitude, and practices related to HPV and its vaccination. Knowledge, attitude, and practice scores were categorized as poor, average, or good based on a defined scoring system. **Results**: The mean age of the study participants was 37.89 ± 11.26 years, with a male to female ratio of 2.90:1. The majority of participants were from an urban background (61.73%) and had a graduate degree (MBBS) (60.2%). The study found that 60% of the doctors had average knowledge about HPV and its vaccine, while 21.54% had poor knowledge and 18.46% had good knowledge. Attitude towards vaccination was generally positive, with 58.08% showing an average attitude and 19.04% showing a good attitude. However, practice scores were low, with 56.35% having average practices, 22.88% having poor practices, and only 20.77% having good practices. Only 11.5% of subjects had personally received the HPV vaccine, and only 49.1% actively encouraged their eligible patients to get vaccinated. **Conclusion**: This study highlights that while medical doctors possess a reasonably good understanding of HPV and its vaccination, there are gaps in specific aspects of knowledge that may hinder optimal vaccination practices. The attitude toward vaccination is positive, but the actual practice is poor, possibly due to factors such as the high cost of the vaccine, doubts about its efficacy and safety, and limited availability. The findings emphasize the need for targeted educational interventions and policy changes to make the vaccine more accessible and affordable, thereby increasing its uptake and reducing the burden of cervical cancer in India.*

Keywords: HPV vaccination awareness, cervical cancer prevention, doctors knowledge attitude practice, vaccine uptake gap, India healthcare system

1. Introduction

Human Papillomavirus (HPV) is a double stranded DNA virus and is one of the most common sexually transmitted infections globally. The virus is responsible for nearly all cases of cervical cancer, as well as several other cancers, including those of the head and neck, vulva, vagina, penis, and anus. Globally, cervical cancer is the fourth most common cancer among women, with an estimated 604,127 new cases and 341,831 deaths in 2020. In India, it ranks as the second leading cause of female cancer, with about 123,907 new cases diagnosed annually.

The development of HPV vaccines has provided a significant opportunity for primary prevention, as approximately 80% of HPV caused cancers can be prevented through vaccination. Organizations such as the World Health Organization (WHO) have recommended the inclusion of HPV vaccines in national immunization programs, and many countries have followed this recommendation. In India, however, the HPV vaccine is not part of the National Immunization Schedule and is primarily available in the private sector and in a few state government hospitals via certain NGOs. Currently, four HPV vaccines are commercially available in India: Cervarix™ (bivalent), Gardasil™ (quadrivalent), Gardasil 9 (nonavalent), and Cervavac™ (quadrivalent). The Indian Academy of Paediatrics Committee on Immunization (IAPCOI) recommends vaccinating girls aged 9-14 with a two dose schedule and those aged 15-26 with a three dose schedule.

Despite these recommendations, HPV vaccine uptake in India remains low due to several factors, including high cost (approximately INR 3,000 per dose), misinformation, and discouraging cultural perceptions for vaccines. Healthcare providers are considered key personnel in providing health education and influencing patients' decisions regarding vaccination. Therefore, understanding the knowledge, attitudes, and practices of doctors is crucial for designing effective intervention programs to improve vaccine acceptance and reduce the burden of cervical cancer. This study aims to fill this gap by assessing the KAP of medical doctors in a tertiary care institute in North Western Rajasthan.

2. Materials and Methods

Study Design and Setting: A hospital based cross-sectional survey was conducted at Sardar Patel Medical College and P.B.M. and Associated Groups of Hospitals in Bikaner, Rajasthan, a tertiary care facility serving a significant area of North-Western India. The study period was from April to July 2025.

Study Population and Sampling: The study population comprised all doctors (undergraduate and postgraduate students, and faculty members) enrolled in various departments of the medical college and associated hospitals. A total of 520 participants were included. Inclusion criteria were a minimum qualification of MBBS or above, age above 24 years, and providing informed consent. Exclusion criteria included those who did not consent, were below 24 years of age, or were non responsive after two failed attempts, and those who left their tenure during the study duration. All eligible and consenting medical doctors available during the study period were included in the study.

Data Collection: A questionnaire was used to collect data, which consisted of 32 questions. The questionnaire included sections on socio demographics (7 questions), knowledge (10 questions), attitude (5 questions), and practices (8 questions). The options "don't know" or "not sure" were considered wrong answers for scoring.

- **Knowledge scores:** poor (0-3 correct answers), average (4-7), and good (8-10).
- **Attitude scores:** poor (0-2), average (3), and good (4-5).
- **Practice scores:** poor (0-3), average (4-5), and good (6-8).

The survey was administered using printed or web based forms (Google Forms).

Statistical Analysis: The collected data were extracted into a Microsoft Excel sheet and analysed using Epi-Info software with the help of appropriate statistical tests.

Ethical Considerations: Written informed consent was obtained from all participants. The study was approved by the Institutional Ethics Committee of Sardar Patel Medical College and Associated Group of P.B.M. Hospitals, Bikaner, Rajasthan. Participant confidentiality and anonymity were maintained.

3. Results

Socio Demographic Characteristics:
Out of 520 participants, the mean age was 37.89 ± 11.26 years. The most common age group was 24-35 years (58.08%). There was a male preponderance, with 74.42% males and 25.58% females, resulting in a male to female ratio of 2.90:1. A majority of subjects were Hindus (91.92%), hailed from an urban background (61.73%), and were married (68.08%). Education level analysis revealed that a great majority had a graduate degree (MBBS) (60.2%). Most participants belonged to SES class I (36.54%).

Table 1: Socio-Demographic Characteristics of Study Population (N=520)

Parameter	Frequency (n)	Percentage (%)
Age Range (in years)		
24-35 years	302	58.08%
36-45 years	118	22.69%
46-65 years	100	19.23%
Gender		
Male	387	74.42%
Female	133	25.58%
Religion		
Hindu	478	91.92%
Muslim	22	4.23%
Others	20	3.84%
Residential Area		
Rural	199	38.27%
Urban	321	61.73%
Marital Status		
Married	354	68.08%
Unmarried	166	31.92%
Level of Education		
MBBS	313	60.20%
Post-graduation	207	39.80%
Socioeconomic Status (SES)		
Class I	190	36.54%
Class II	172	33.08%
Class III	158	30.38%
Class IV	0	0.00%
Class V	0	0.00%

Knowledge, Attitude, and Practice Scores:
The mean knowledge score was 7.9 ± 1.8. Overall, 60.0% of subjects had average knowledge, 21.54% had poor knowledge, and 18.46% had good knowledge.

The mean attitude score was 2.8 ± 1.0. A majority of participants (63.85%) had a score of 3-5, while 36.15% had a score of 0-2. The final breakdown showed 58.08% with an average attitude, 22.88% with a poor attitude, and 19.04% with a good attitude.
The mean practice score was 4.7 ± 2.1. A majority of subjects (65.19%) had a score of 3-5, 20.96% had a score of 6-8, and 13.85% had a score of 0-2. Overall, 56.35% had average practices, 22.88% had poor practices, and 20.77% had good practices.

Table 2: Distribution of Study Population According to Knowledge, Attitude, and Practice (KAP) Scores

Score Category	Knowledge (%)	Attitude (%)	Practice (%)
Poor	21.54%	22.88%	22.88%
Average	60.00%	58.08%	56.35%
Good	18.46%	19.04%	20.77%

Key Findings from Questionnaire Responses:

- **Knowledge:** A high percentage of respondents knew about the HPV vaccine (93.8%) and that vaccination is available against HPV (75.9%). However, the study also revealed some knowledge gaps. For instance, only 65.6% correctly identified the primary contributors of cervical cancer, and 69.2% knew a common symptom.
- **Attitude:** The attitude of the doctors was largely positive. A high percentage believed that healthcare workers have a role in promoting HPV vaccination (85.7%) and that health programs are useful in prevention (78%). An even higher percentage (88.1%) were willing

to actively promote prevention strategies in their workplace.

- **Practice:** Despite the positive attitudes, the self reported practice was low. Only 11.5% of the subjects had personally taken the HPV vaccination. Furthermore, only 49.1% of doctors actively encouraged eligible patients to receive the vaccine. This poor practice was attributed to the high cost of the vaccine, doubts about its efficacy and safety, and limited availability.

4. Discussion

This study reveals a significant disparity between the knowledge, attitude, and actual practice regarding HPV vaccination among medical doctors in North-Western Rajasthan. While the participants generally have a good foundational knowledge about HPV and its association with cervical cancer, the overall knowledge level is rated as "average" for a majority of the doctors (60.0%). This aligns with previous studies that have also identified knowledge gaps even among healthcare professionals in other regions of India and globally.

The attitude of the medical doctors in this study was largely positive. The strong belief that health workers have a key role in promoting vaccination (85.7%) and the willingness to actively promote prevention strategies in the workplace (88.1%) are crucial for future public health initiatives. This positive attitude is consistent with a study from Bangladesh, which also reported a high attitude score (75.88%) among young medical professionals.

However, the most concerning finding is the gap between positive attitude and poor practice. Only 11.5% of the doctors had received the vaccine themselves, and less than half (49.1%) actively encouraged patients to get vaccinated. This poor uptake reflects a major challenge in implementing a successful HPV vaccination program in India. The reasons for this poor practice, as highlighted in the discussion, include the high cost of the vaccine, doubts about its efficacy and safety, and limited availability.

This study suggests that to bridge the gap between knowledge/attitude and practice, a multi pronged approach is necessary. First, there is a need for targeted educational programs to provide up to date and comprehensive information to doctors and other healthcare providers, particularly focusing on the specific strains of HPV that cause cancer, the vaccine's efficacy, and safety profile. Second, policy level interventions are required to address the prohibitive cost of the vaccine and improve its availability. Including the HPV vaccine in the National Immunization Programme would be a significant step in this direction. Finally, encouraging personal vaccination among healthcare staff can increase their confidence in recommending it to patients, as they become advocates for the vaccine themselves.

5. Conclusion

This study concludes that while medical doctors in a tertiary care institute in North-Western Rajasthan have a high level of basic knowledge about HPV and a positive attitude towards vaccination, there are significant gaps in their understanding of critical aspects of the vaccine and its application. This lack of specific knowledge, combined with barriers like high cost and limited availability, contributes to poor vaccination practices. To enhance the uptake of the HPV vaccine and reduce the burden of cervical cancer, it is essential to implement nationwide sensitization campaigns, integrate the vaccine into the National Immunization Programme, and provide continuous training for healthcare providers.

6. Limitations

This study has several limitations. It relied on self reported data, which may be subject to recall or reporting bias. As this was a hospital-based cross-sectional study including all available and consenting doctors, generalizability to other settings may be limited. Lastly, the cross-sectional design captures data at a single point in time, which makes it difficult to assess changes in knowledge, attitudes, or practices over time.

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