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Original Research Article

Understanding Cervical Cancer Prevention and Practice of Human Papillomavirus Vaccination: A Study Among Medical Students of Ahmedabad

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ABSTRACT

Background: Early HPV vaccination can significantly reduce the burden of cervical cancer, yet most of India's population remains unprotected. Medical students, as future healthcare advocates, are key to improving HPV vaccination through their awareness and practice. This study aims to assess the socio-demographic profile of participants, measure their awareness about cervical cancer and its prevention, vaccination status, and to correlate these findings with socio-demographic details.

Material and Methods: A cross-sectional study was conducted among 181 medical students of Ahmedabad using a standardized, validated questionnaire consisting of open ended, Yes/No/Don't know and MCQ questions. Statistical analysis was performed and appropriate tests were applied.

Results: The study included 128 females (70.7%) and 53 males (29.3%) with a mean age of 19.85 ± 1.60 years. While 82.3% identified cervical cancer as a leading cause of death among women, only 56.9% were aware that HPV affects both genders. Although 77.3% were aware of the HPV vaccine, correct knowledge about the recommended age group and dose schedule was low (14.9% and 5.5%respectively). Only 43 students (23.75%) were vaccinated with significantly more females being vaccinated ($z = 2.5297$, $p = 0.0114$). Among unvaccinated participants, the major barriers to HPV vaccination included lack of knowledge (31.15%), limited access to vaccine (10%), and lack of motivation (6.52%).

Conclusion: Although awareness about HPV infection and cervical cancer among medical students is good, there is a lack of awareness and knowledge about prevention of cervical cancer. Practice of HPV vaccination among medical students was found to be low.

Keywords: Cervical cancer, Human Papillomavirus, Medical Students, Prevention, Vaccination

INTRODUCTION

Cervical cancer ranks as the fourth most frequent cancer among women globally and the second most common cancer among Indian women. Current estimates indicate that every year 127526 women are diagnosed with cervical cancer and 79906 die from the disease.[1,2] In 2020, it accounted for 9% of all deaths in India showing that it was the second most common cause of death from cancer in India [3].

There are several recognized risk factors for cervical cancer—persistent infection with human papillomavirus (HPV), marriage at early age, multiple sexual partners, early conception, poor genital hygiene, smoking and sexual intercourse at young age [4,5,6,7]. HPV infection, a sexually transmitted infection, is the major cause of cervical cancer. High-risk HPV strains 16 and 18 account for approximately 80% of cervical cancer cases and 63% of high-grade cervical precancerous lesions in India [8].

The efficacy of HPV vaccination in protecting from HPV infection is well established [9]. Two types of HPV vaccine are available, Bivalent vaccine and Quadrivalent vaccine licensed for use in India [10]. Despite the established role of HPV vaccination in the prevention of cervical cancer, the majority population of India remains unprotected. Though recommended by various authorities including the World Health Organization (WHO) and the Indian Academy of Pediatrics, it is not a part of the National Immunization Schedule (NIS) of India yet.[11,12,13]

Medical students, as future doctors, are the key stakeholders in improving awareness of HPV-related disease and HPV vaccination. As the medical fraternity is naturally trusted by the general population for healthcare related guidance, medical students can motivate them for vaccination only if they themselves have correct knowledge about HPV vaccination. Hence, it is important to assess their perspective and understanding about cervical cancer prevention and HPV Vaccination.

This study aimed to assess the socio demographic profile of medical students in the Ahmedabad region, measure their awareness and knowledge of cervical cancer and its prevention, their vaccination status, and correlate these findings with socio demographic details.

MATERIAL AND METHODS

Study design and population:

A Cross sectional, observational, descriptive type of study was carried out between February 2025 to March 2025 among medical students from the first phase to the final phase of medical colleges in Ahmedabad city of Gujarat. The only exclusion criteria was students who did not provide consent.

Sample size calculation:

In the absence of any prior study assessing awareness and knowledge regarding HPV vaccination in the target population, the sample size was calculated using prevalence of 50% and a margin of error of 15%. This yielded a minimum required sample size of 178 participants. A total of 181 students were included in the study.

Sampling technique:

Convenience sampling technique

Study tools:

A standardised and structured questionnaire was developed and validated by distributing it to five experts in the field of public health. The questionnaire included open ended, Yes/No/Don't know and MCQ type questions. The validated questionnaire was distributed among the participants through google forms for wider reach and confidentiality of participants. The responses were recorded securely into google sheets.

Ethical considerations:

Ethical approval was taken from the Institute Ethics Committee and an informed consent form was incorporated as part of the questionnaire. The identity of the participants was kept anonymous and data was ensured to be confidential.

Data analysis:

Descriptive statistics were presented as frequencies (mean and standard deviation (SD)) for quantitative variables and as numbers and percentages for categorical variables.

Chi-square test was used to compare their knowledge score with their demographic profile, where P value of < 0.05 was considered significant.

RESULTS

A total of 181 participants were included in the study aged between 17 to 24 with mean age of 19.85 ± 1.60 years. Of the total participants, 128 (70.7%) were females and 53 (29.3%) were males. Year-wise distribution is shown in Figure 1. 54 (29.8%) were first-year students, 53 (29.3%) were in the second year, 49 (27.1%) in the third

year, and 25 (13.8%) in the final year of their medical education. A majority of the students' parents had attained undergraduate or higher education, with 152 fathers (83.97%) and 145 mothers (80.11%) having received at least an undergraduate degree.

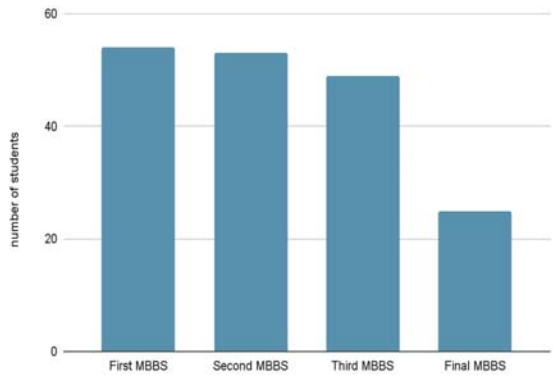

Figure 1. Year-wise distribution of medical students

Table 1 shows the frequency of correct responses by the students regarding knowledge of cervical cancer. Although, the majority were aware about the burden and association of a causative agent to development of cervical cancer, only 50.96% males and 59.37% females knew about the impact of HPV on both genders. We found the awareness level regarding screening tests for cervical cancer to be low Only 50.94% males and 54.98% females were aware about PAP smear, the screening test for cervical cancer.

Table 2 shows the frequency of correct responses by the students regarding knowledge about HPV vaccination. Most were aware about the availability of vaccines for prevention of cervical cancer but their knowledge regarding recommended age group, dose schedule and interval between doses was found to be very low.

Major sources of knowledge regarding HPV vaccine were reported to be Medical curriculum by 60 (54.1%) participants, 27(24.3%) reported social media, 11 (9.9%) cited seminars and awareness sessions and 7 (6.3%) attributed their source to be word of mouth.

Table 3 shows the vaccination status of medical students. Only 43 (23.75%) students were vaccinated out of which 6 were males and 37 were females. Females had significantly higher vaccination rates as compared to Males ($z = 2.5297$, $p = 0.0114$).

Among the vaccinated, 15 (34.88%) were motivated by their parents while 11 (25.58%) were influenced by healthcare professionals. Among the unvaccinated group, the major barriers to not getting vaccinated were reported as lack of knowledge about the vaccine in 31.15%, while 6.72% cited a lack of motivation. 10% of students mentioned issues with vaccine availability as a barrier. 84(60.86%) students intended to get vaccinated in the future out of which 52 (61.90%) reported recent gains in awareness as their motivation.

According to Table 3, no statistically significant association was found between the HPV vaccination status of students and the educational level of their father or mother ($p > 0.05$) similar to the finding seen in a study conducted by Swarnpriya K et al [14].

DISCUSSION

This study aimed to assess the knowledge and awareness about cervical cancer and its prevention and practice of Human Papillomavirus vaccination among medical students of Ahmedabad region.

The mean age of participants was 19.85 ± 1.60 years with a majority belonging to the first year of MBBS. This is comparable to the study conducted by Petkar et al (2025) [15] who reported a mean age of 19.15 ± 1.14 years in their study conducted among medical students in a tertiary care teaching hospital of a university in Central India.

In terms of gender distribution, 128 (70.7%) were females and 53 (29.3%) were males, aligning with the study done by Priya et al [16], which also reported a higher proportion of female participants.

Our results indicate moderate awareness about cervical cancer as a leading cause of death among women in India and Human Papillomavirus infection being the major cause in most cases. A significant finding was that only around half of the students (50.94% males and 59.37% females) knew that HPV affects both genders. These

Table1: Questions assessing awareness about HPV infection and cervical cancer

Questions	**Males (n=53) correct response number (%)**	**Females (n=128) correct response number(%)**
Is cervical cancer one of the leading causes of cancer deaths among women in India?	40 (75.47%)	109 (85.15%)
Is there any causative agent associated with cervical cancer?	50 (94.33%)	119 (92.96%)
How is HPV transmitted?	46 (86.79%)	106 (82.81%)
Does HPV only infect women?	27 (50.94%)	76 (59.37%)
Is the persistence of HPV infection the reason for the development of cervical cancer?	33 (62.26%)	91 (71.09%)
Which strains of HPV cause the majority of HPV - related cancers?	17 (32.07%)	47 (36.71%)
Is cervical cancer preventable?	46 (86.79%)	112 (87.50%)
Are you aware about the screening test for cervical cancer?	27 (50.94%)	70 (54.98%)

findings were similar to the results of study by Priya et al (2022)[16] and Rai S et al(2024)[17].

Our study highlighted the gap in knowledge about the schedule of HPV vaccine. Very few students knew the correct recommended age group for vaccination and number of doses (14.90% and 5.50% respectively) which was less compared to the results of Sharma et al(2020) where it was found to be 57.1% and 42% respectively.[18]

In the present study, the majority of students reported the medical curriculum and social media as the primary sources of awareness regarding the HPV vaccine while only 9.9% of students cited awareness seminars as a source of information, indicating a significant underutilization of targeted supplementary educational initiatives such as institutional workshops or public health campaigns. These findings are consistent with those of Petkar et al. [15], who also observed that internet and social media were the most commonly reported sources of information about cancer preventive vaccines (82.4%), followed by friends (39.7%) and parents (28.7%).

A critical finding was the low rates of vaccination among medical students. Only 43 students (23.75%) were vaccinated with 28.9% females and 11.3% males. This is relatively higher than the findings of Sharma et al. (2020), where only 10% of female students and none of the male students were vaccinated [17].

Among unvaccinated participants, lack of knowledge was the primary barrier followed by lack of access to vaccines. 60% unvaccinated students expressed an intention to get vaccinated in the future and attributed their motivation to recent gains in awareness with some specifically mentioning this study as a contributing factor in their decision making. This shows the powerful impact of

Table 2 :Questions assessing awareness about HPV vaccination

Questions assessing knowledge about cervical cancer	**Males (n=53) correct response number (%)**	**Females (n=128) correct response number (%)**
Are you aware of any vaccine available for cervical cancer prevention?	40 (75.47%)	100 (78.12%)
Is the HPV vaccine a part of the National Immunisation program of India?	32 (60.37%)	75 (58.59%)
What is the recommended age group for HPV vaccination?	8 (15.09%)	19 (14.84%)
What is the number of recommended doses of HPV vaccination?	2 (3.77%)	8 (6.25%)
What is the recommended interval between doses of HPV vaccination?	0 (0.00%)	5 (3.90%)
Is HPV vaccination contraindicated in pregnancy/ Lactation?	15 (28.30%)	41 (32.03%)
Do you need to get screened before getting the HPV vaccine?	12 (22.64%)	56 (43.75%)
Is the vaccine recommended for an individual already infected with HPV?	19 (35.84%)	38 (29.68%)

Table 3. Practice of HPV Vaccination among medical students

	Vaccinated	**Unvaccinated**	**P Value**	**Z Value**
	n (%)	n (%)		
Males	6 (11.32)	37 (28.90)	p = 0.0114	z = 2.5297
Females	47 (88.67)	91 (71.09)		

targeted education and the need for stronger awareness programs for medical students.

A limitation of this study was its cross-sectional design which does not establish casualty and only captures data at a single point of time. Self-reporting and non responsiveness could also affect the generalizability of findings.

For future recommendations, conducting multi-centre studies with larger sample sizes could enhance representativeness. Interventional studies with evaluation

of pre-awareness session and post-awareness session data could help improve knowledge about cervical cancer prevention and motivate more students to get vaccinated. The findings of this study reinforce the need to design comprehensive public health strategies that promote HPV vaccination with emphasis on equal importance for males to get vaccinated.

CONCLUSIONS

This study highlights the lack of awareness and knowledge about cervical cancer prevention and Human Papillomavirus Vaccination among medical students. The practice of HPV vaccination was found to be low suggesting a need for enhanced education for more students to get vaccinated with emphasis on equal importance for males to get vaccinated.

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