

# Awareness on human papilloma virus vaccine among medical students in rural area



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## ABSTRACT

**Background:** Cervical cancer, with an estimated 604,000 new cases and 342,000 deaths in 2020, is the fourth most common cancer among women globally. Low- and middle-income countries accounted for 90% of the new cases and deaths worldwide in 2020. Cervical cancer in females can be prevented to a great extent by vaccination. Implementation of the human papillomavirus (HPV) vaccine is still facing challenges, but it has the potential to address the challenges of cervical cancer screening in India. Implementation of HPV vaccination faces barriers of acceptance and lack of awareness, along with a high vaccine cost. **Aims and Objectives:** To assess the knowledge, attitude, and practice of the HPV vaccine among 1<sup>st</sup> and 2<sup>nd</sup> year medical students in a rural medical college. **Materials and Methods:** A descriptive cross-sectional study was conducted among 240 study subjects using a pre-tested, semi-structured questionnaire. The results were expressed in descriptive statistics like proportions and percentages. **Results:** 94% of the students were aware that cervical cancer is preventable, whereas 87% of them knew that cervical cancer can be prevented by a vaccine. 84% of the students had the knowledge that HPV vaccine is available in India. The maximum number of students were unvaccinated (92%), whereas 67% were ready to take the HPV vaccine in the future. **Conclusion:** Sensitization regarding the importance of the HPV vaccine to the general public can be achieved only when health care professionals are adequately aware of the safety and efficacy of the HPV vaccine. The first step in this direction is to educate the students who will form the backbone of our health care system in the future.

**Key words:** Human papilloma virus; Rural; Vaccine; Cervical cancer; Medical students; Knowledge; Attitude and practice

## INTRODUCTION

Cervical cancer, with an estimated 604,000 new cases and 342,000 deaths in 2020, is the fourth most common cancer among women globally. Low- and middle-income countries accounted for 90% of the new cases and deaths worldwide in 2020.<sup>1</sup>

Human papillomavirus (HPV) family: HPV, the main causative factor for cervical cancer, belongs to the family of double-stranded DNA viruses, which have tropism for mucosal and cutaneous epithelia.<sup>2,3</sup> HPV is mainly transmitted sexually, but spreading through the cutaneous route cannot be ruled out.<sup>3,4</sup>

The HPV family has more than 200 members classified into two groups: non-oncogenic HPVs, and oncogenic HPVs according to their pathogenicity. Non-oncogenic HPVs, or low-risk HPVs, are associated with anogenital warts and recurrent respiratory tract infections. Oncogenic HPVs, or high-risk HPVs, are responsible for anogenital cancers and head and neck squamous cell carcinomas in both males and females.<sup>2-6</sup> HPV16 and HPV18 genotypes are involved in more than 70% of cervical precancerous and cancerous lesions.<sup>3</sup> Other strains of HPV, like 31, 33, 45, 52, and 58, are also associated with about 10–20% of the cases.<sup>7</sup>

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Cervical cancer in females can be prevented to a great extent by vaccination. The three HPV vaccines currently in use are Cervarix 2v (GlaxoSmithKline Biologicals, Rixensart, Belgium), Gardasil 4v (Merck and Co., Kenilworth, NJ, USA), and Gardasil 9v (Merck and Co., Kenilworth, NJ, USA).<sup>3,5,7</sup>

Since 2008, two types of HPV vaccines have been available in India: a quadrivalent vaccine (Gardasil), which protects against four strains of HPV, and a bivalent vaccine (Cervarix), which protects against two strains of HPV. Both of the vaccines offer protection against the high-risk HPV 16 and 18 strains.

In 2009, two Indian states launched a pilot project to examine the feasibility and acceptability of integrating a vaccination program into public health services. Since then, three Indian states have successfully implemented HPV vaccination programs.<sup>8</sup> Implementation of the HPV vaccine is still facing challenges, but it has the potential to address the challenges of cervical cancer screening in India. Implementation of HPV vaccination faces barriers of acceptance and lack of awareness, along with a high vaccine cost.<sup>9</sup>

Before any public health service has to reach the general public, initial awareness about the service should be present among health care practitioners. Hence, the present study was conducted to assess the knowledge, attitude, and practice of the HPV vaccine among 1<sup>st</sup> and 2<sup>nd</sup> year medical students, who form the potential pool of doctors serving the community in the future.

### Aims and objectives

To assess the knowledge, attitude, and practice of the HPV vaccine among 1<sup>st</sup> and 2<sup>nd</sup> year medical students in a rural medical college.

## MATERIALS AND METHODS

### Research design and study population

This descriptive cross-sectional study was conducted among 1<sup>st</sup> and 2<sup>nd</sup> year medical students at a rural medical college for a period of 4 months.

### Sample size

The sample population consisted of 270 1<sup>st</sup> and 2<sup>nd</sup> year medical students at a rural medical college. A convenient sampling method was used in this study.

### Inclusion and exclusion criteria

All 1<sup>st</sup> and 2<sup>nd</sup> year medical students who gave written consent to the study were included in the study.

Students who were not willing to participate in the study and who were absent were excluded from the study.

### Tool for data collection

After obtaining approval from the institutional ethics committee, the study was initiated. A pre-tested, semi-structured questionnaire was used for data collection, comprising two parts, and the relevant data was collected.

- Part - I: Selected Demographic Details
- Part - II: Questions on HPV vaccine availability, availability of screening tests for cervical cancer, causative organisms for cervical cancer, and others.

### Procedure for data collection

For the purpose of the study, the semi-structured questionnaire was sent as a Google Form, and the responses were obtained. Later, a session was taken on the HPV vaccine, causative factors, and vaccine usage for the students included in the study.

### Statistics

Data was entered into a Microsoft Excel sheet and analyzed using the statistical package for social sciences, version 15. The results were expressed in descriptive statistics like proportions and percentages.

## RESULTS

A total of 270 students participated in the study. Out of the 270 participants included in the final analysis, 106 (40.76%) were male and 164 (59.23%) were female. Most of them (64.4%) were below 20 years of age, 34.4% belonged to 21–25 years of age; and only 1.1% were above 26 years of age.

94% of the students felt that cervical cancer is preventable, whereas 87% knew that cervical cancer can be prevented by vaccination. 84% of the students thought that the HPV vaccine was available in India. The maximum number of students were unvaccinated (92%), whereas 67% were ready to take the HPV vaccine in the future. 96% of the students were ready to update their knowledge about the HPV vaccine, and 96% would like to recommend the HPV vaccine to others. The majority (93%) of the students had knowledge about the screening test to detect cervical cancer (Graph 1).

88.5% of the students knew that the causative agent of cervical cancer is a virus. 79.25% of the students thought cervical infections were the leading risk factor for cervical cancer, followed by Poor hygiene (64.10%), early age at first coitus (52.60%), multiparity (43.70%), family history (51.12%), and smoking (29.25%). Maximum (87.04%) students were of the opinion that HPV is caused by sexual

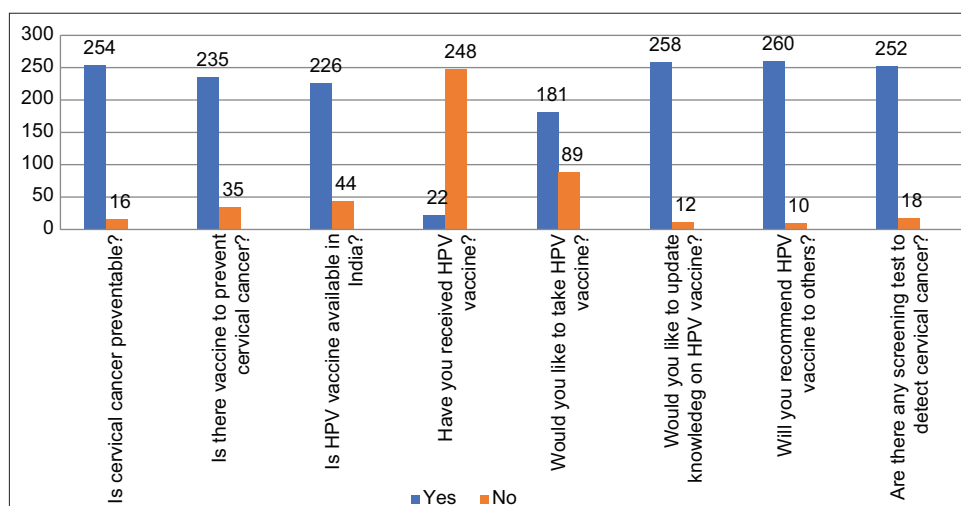
**Table 1: Knowledge on human papilloma virus vaccine in medical students**

S. No.	Parameter	Frequency	Percentage
1	<b>Cervical cancer is caused by,</b>		
	Bacteria	25	9.25
	Virus	239	88.50
	Fungi	06	2.25
2	<b>Risk factors for cervical cancer</b>		
	Cervical infections	214	79.25
	Early age at first coitus	142	52.60
	Multiparity	118	43.70
	Family history	138	51.12
	Poor hygiene	173	64.10
	Smoking	79	29.25
3	<b>Transmission of HPV is caused by?</b>		
	Sexual intercourse	235	87.04
	Blood borne	101	37.41
	Vertical	92	34.07
	Injectables	99	36.67
	Don't know	18	6.67
4	<b>At what age HPV vaccine should be taken?</b>		
	0–10 years	50	18.50
	10–30 years	203	75.20
	30–50 years	17	6.30
5	<b>Protection provided by HPV vaccine towards cervical cancer is,</b>		
	90–100	30	11.10
	75–90	136	50.40
	50–75	96	35.50
	30–50	8	3
6	<b>What is the reason preventing you to receive or advice HPV vaccine?</b>		
	High cost	36	13.30
	Side effects	91	33.70
	Doubt about effectiveness	96	35.50
	Lack of access	91	33.70
	Lack of knowledge	140	51.80
7	<b>What is the source of information for you on HPV vaccine?</b>		
	Teachers and textbooks	181	67
	Internet	59	21.90
	Newspaper and TV	7	2.60
	Friends	23	8.50
8	<b>Complete schedule of HPV vaccine includes how many shots?</b>		
	One	14	5.20
	Two	144	53.30
	Three	100	37
	Four	12	4.50
9	<b>Mention the screening tests for detection of cervical cancer you are aware of,</b>		
	Antigen antibody reaction	02	1
	Biopsy	02	1
	Bethesda system	03	1
	CT scan	07	2.5
	MRI scan	09	3
	PET scan	02	1
	ELISA	04	1.5
	FNAC	07	2.5
	Histopathology	02	1
	PCR	05	2
	HPV test	05	2
	Medicines and surgery	01	0.5
	Pelvic examination	03	1
	PAP smear	147	54
	No idea/not aware/don't now	58	21.5
	No response	17	6.25

CT: Computed tomography, MRI: Magnetic resonance imaging, PET: Positron emission tomography, ELISA: Enzyme-linked immunosorbent assay, PCR: Polymerase chain reaction, HPV: Human papillomavirus

intercourse, followed by blood-borne routes (37.41%), injectables (36.67%), and vertical transmission (34.07%).

75.20% of the students said that HPV vaccine should be taken between the ages of 10 and 30 years, whereas 50.40%



**Graph 1:** Attitude and practice on human papilloma virus vaccine utilization in medical students.

thought that HPV vaccine provides 75–90% protection against cervical cancer. The majority (51.80%) of the students cited a lack of knowledge as the main reason for not taking the HPV vaccine. 67% of the patients had acquired knowledge of HPV through teachers and textbooks. 53.30% were aware that two doses of HPV vaccine are required under the vaccination schedule. 54% of the students knew that the PAP smear was the screening test for cervical cancer, whereas 21.5% of the students had no idea, didn't know, or were not aware of the screening test available for cervical cancer screening (Table 1).

## DISCUSSION

Cervical cancer is an important health hazard for women. Despite being a curable cancer if detected early, cervical cancer contributed to 9.4% of new cancer cases and 70,000 deaths in India in 2020.<sup>10</sup> The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke has advised only opportunistic screening to look for early cancerous lesions. HPV testing and mandatory screening and vaccination are not feasible in low-to-medium income countries like India's resource-constrained setting.<sup>10</sup> In this setting, knowledge, attitude, and practice regarding HPV vaccine among health care professionals become important as they are important mediums through which awareness of HPV vaccine can be passed on to the general public.

In the current study, the majority of the students (94%) were well aware that cervical cancer was preventable. This was in concordance with the study of Pandey *et al.*, where 84.8% were aware of the preventable nature of cervical cancer.<sup>11</sup> Awareness about the preventable nature of cervical cancer among educated youth in India, Nepal, and Sri Lanka was 66%, 58.8%, and 57.7%, respectively, in

an article by Joy *et al.* This difference is because the study population selected is made up of students, which is not a true representation of the general populace.<sup>12</sup> Another article published in one of the largest private universities in India showed minimal knowledge in both boys and girls (44%), as the study population included both biology and non-biology students.<sup>13</sup>

In the current study, even though 84% of the students knew that the HPV vaccine was available in India, only 8% of the students were vaccinated. But 67% of the students were ready to take vaccines in the future. This can be attributed to the lack of motivation or apprehension regarding the safety and efficacy of the vaccine, even when studies have shown that the efficacy of the HPV vaccine against HPV-related disease is 95.8%.<sup>14</sup>

The strength of the study was that the questionnaire was followed by an informative session based on the HPV vaccine to educate the students. However, our study had some limitations. A post-test was not conducted after conducting a session on HPV, and the study cannot be generalized to the population due to the inadequate sample size.

In India, only three states have introduced the HPV vaccine. Introduction and wide coverage of the HPV vaccine require a combined effort by health care workers and the general public. Sensitization regarding the importance of the HPV vaccine to the general public can be achieved only when health care professionals are adequately educated regarding the safety and efficacy of the HPV vaccine. The first step in this direction is to educate the medical students who will form the backbone of our health care system in the future. So, similar studies followed by academic sessions on HPV vaccine and its importance help in achieving satisfactory coverage of HPV vaccine in vulnerable populations.

## Limitations of the study

A post-test was not conducted after conducting a session on HPV, and the study cannot be generalized to the population due to the inadequate sample size.

## CONCLUSION

Sensitization regarding the importance of the HPV vaccine to the general public can be achieved only when health care professionals are adequately aware of the safety and efficacy of the HPV vaccine. The first step in this direction is to educate the students who will form the backbone of our health care system in the future.

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### Authors Contribution:

**MLM**- Data collection, literature survey; **SM**- Coordination and manuscript revision, review manuscript, literature survey; **VHK**- Design of study, statistical analysis and interpretation, literature survey; **PN**- Literature survey, prepared first draft of manuscript, manuscript preparation and submission of article.

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