



Original Article

Knowledge, Attitudes, Uptake and Barriers to HPV Vaccination Among Paramedical Students in South Gujarat: A Cross-Sectional Study

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ABSTRACT

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Introduction: In India, it is estimated that, around 1 in 53 Indian women suffers from cervical cancer during their lifetime. HPV vaccines have been licensed for use in India by the Drug Controller General of India since 2008, unfortunately, until recently, these vaccines have not been included in the routine government immunization program. **Objectives:** To determine the knowledge, attitude and practice of medical and paramedical students regarding HPV vaccine and cervical cancer. To document the barriers for implementing HPV vaccination in government facilities. **Methodology:** A cross sectional study was conducted among female students of medical, nursing and physiotherapy in the institutes located in the new civil hospital campus. A convenient sampling was done. All the participants were interviewed using pre-designed, pre tested semi-structured questionnaire at their institutes. **Results:** Among the 258 study participants median age is 19 years. 128 (49.6%) participants have heard about HPV vaccine and 30 (11.6%) have taken vaccine. Out of the 100 Physiotherapy students 58(58.0%) students have heard about HPV vaccine and 7(7.0%) among them have taken the vaccine. Out of 158 Nursing students interviewed 70(44.3%) have heard about the HPV vaccine and 23 (14.5%) among them have taken the vaccine. Concerns regarding the efficacy (10.2%), safety (36.7%) and cost of the vaccine (12.9%) were responsible for poor uptake of vaccination. **Conclusion:** Perceptions and practice of HPV vaccination is sub optimal among paramedical students. The need of the hour is to raise awareness about the cervical cancer and HPV vaccine and emphasize early screening and vaccination.

Keywords: HPV vaccine, Cervical cancer, Knowledge, Practices.

INTRODUCTION

Cervical cancer is the fourth most common cancer in women globally, with around 6,60,000 new cases and around 3,50,000 deaths in 2022(1). Cervical cancer is ranked as the second most common cancer among women in India. Current estimates indicate approximately 1,32,000 new cases diagnosed and 74,000 deaths annually in India(2). Human Papillomavirus virus stands as the most prevalent sexually transmitted biological agent, giving rise to various conditions in both men and women, including precancerous lesions and cancer. Cervical cancer stands out as the most common, constituting nearly 85% of all HPV-related tumours(3).

Human papillomavirus (HPV) vaccines are among the most effective prophylactic vaccines available and have established several important landmarks in human vaccinology. They are the first vaccines to prevent infection by a sexually transmitted infectious agent (4). Despite being in use for over ten years in India, the HPV vaccine is still not offered by the Indian government as a mandatory vaccination under the National Immunization Programme. Even among highly educated people in the medical field, there is a lack of knowledge about its dosage, timing, and cost. In order to protect themselves and encourage their patients to do the same, health care providers must be fully informed on the HPV vaccine(5).

MATERIALS AND METHODS

A cross-sectional study was conducted among female students of nursing and physiotherapy institutes located in the new civil hospital surat campus. Study participants were first, second, third and fourth year female students from the Government Nursing College and Government physiotherapy college Surat. The study was conducted between May 2023 to November 2023. All the participants were interviewed at their respective institutes using a pre designed pre tested semi structured questionnaire. A convenient sampling was used. After meeting the inclusion and exclusion criteria a total of 258 students were interviewed. Ethical approval was obtained from the Institutional Human Research and Ethics Committee (No. GMCS/STU/ETHICS-3/Approval/3673/23, dated 13 February 2023. All participants' autonomy and confidentiality were respected and maintained. Written informed consent was obtained from each participant after explaining the study's aim and objectives. Unique identity number was given to each participant and data was analyzed anonymously. Data files and information was kept under a password protected device. All data were collected from the participants after informed consent and kept strictly confidential Data was collected during May 2023 to July 2023. Data collected was computed into MS Excel. Analysis of quantitative interview data was done using Microsoft Excel and IBM SPSS software ver. 23. Descriptive statistics of participants such as socio demographic variables, knowledge and practices of HPV vaccine and cervical cancer were analyzed. This was followed by the tests of association to explore the association within these variables (Chi square test).

RESULTS

Median age of participants was 19 years with an interquartile range of 2.25 years. A total of 258 students have participated in the study, including 100 from the physiotherapy and 158 from the nursing. They were age group ranging from 17 years to 24 years.

Table 1: Socio-demographic characteristics of study participants (n =258)

Variable	n (%)
Course pursuing	
Nursing	158 (61.2)
Physiotherapy	100 (38.8)
Year of study in college.	
First	74 (28.7)
Second	67 (25.9)
Third	63 (24.5)
Fourth	54 (20.9)
Socioeconomic class	
Upper	83 (32.2)
Upper middle	80 (31.1)
Middle	39 (15.1)
Lower middle	45 (17.4)
Lower	11 (4.2)

A highly balanced representation across all levels is shown by the distribution of students by academic year, which reveals that 28.7% are in their first year, followed by 25.9% in their second, 24.5% in their third, and 20.9% in their fourth. Students from the top (32.2%) and upper middle (31.1%) classes make up the majority of the student body, while those from the medium (15.1%), lower middle (17.4%), and lower class (4.2%) make up the lower section. (Table 1).

Table 2: Knowledge level of paramedical students about HPV vaccine (n=128)

Variables	No (%) Nursing	Test statistic, p value	No (%) Physiotherapy	Test statistic, p value
Heard of HPV vaccine	70 (48.2)		58 (58.0)	
Knowledge of HPV vaccine				
Can prevent Cervical cancer	55 (78.5)	$\chi^2=9.52$	43 (74.1)	$\chi^2=8.10$
Can prevent other cancer	31 (44.3)	p value =0.002	24 (41.3)	p value =0.004
Ideal age for HPV vaccination				
9-14 years	28 (18.6)	$\chi^2=12.65$	13 (22.4)	$\chi^2=10.29$
Above 18 years	25 (17.2)	p value =0.0017	6 (10.3)	p value =0.006

Any age	10 (6.8)		2 (3.4)	
Source of information				
Doctors	18 (25.7)	$\chi^2=22.19$ p value =0.0005	6 (10.3)	$\chi^2=17.17$ p value =0.0006
Friends	10 (14.2)		11 (18.9)	
Internet	35 (50.0)		23 (39.6)	
Books	24 (34.2)		10 (17.2)	

A higher percentage of physiotherapy students (58%) had heard of the HPV vaccine compared to nursing students (48.2%). Among those aware, 78.5% of nursing and 74.1% of physiotherapy students knew it prevents cervical cancer, while fewer recognized its role in preventing other cancers. Most respondents identified the ideal vaccination age as 9–14 years, though awareness varied significantly between groups. The internet was the most common source of information, followed by books and doctors. Statistically significant differences were observed in all knowledge domains and sources of information, with p-values <0.05 (Table 2).

Table 3: Association of course of study with attitude and practice of HPV vaccination

Course of study	Awareness of the vaccine			Test statistic, p value
	Yes	No	Total	
Nursing	70(44.3%)	88 (55.8%)	158 (100%)	$\chi^2 = 4.59$, p value= 0.032
Physiotherapy	58(58.0%)	42 (42.0%)	100(58%)	
	HPV vaccine taken			
	Yes	No	Total	$\chi^2 = 3.40$, p value= 0.065
Nursing	23 (14.5%)	135 (85.5%)	158 (100%)	
Physiotherapy	7 (7%)	93 (93.0%)	100 (100%)	
	Willingness for vaccine			$\chi^2 = 3.10$, p value= 0.077
	Yes	No	Total	
Nursing	92(58.2%)	66 (41.8%)	158 (100%)	
Physiotherapy	47(47.0%)	53 (53.0%)	100 (100%)	

Awareness was significantly higher among physiotherapy students (58%) than nursing students (44.3%), with a statistically significant difference ($\chi^2 = 4.59$, $p = 0.032$). However, actual vaccine uptake was low in both groups, slightly higher among nursing students (14.5%) than physiotherapy students (7%), though this difference was not statistically significant ($p = 0.065$). Willingness to receive the vaccine was greater among nursing students (58.2%) compared to physiotherapy students (47%). Overall, while awareness differs significantly by course of study, actual vaccination and willingness rates remain suboptimal in both groups (Table 3).

Table 4: Descriptive analysis of reasons for not taking vaccines

Reasons for not taking the vaccine	Nursing (n=135) No (%)	Test statistics	Physiotherapy (n=93) No (%)	Test statistics
Lack of knowledge about HPV vaccine	19 (14.1)	$\chi^2=9.07$ p value =0.05	10 (10.8)	$\chi^2=13.05$ p value =0.08
Don't think it is Necessary	32 (23.7)		23 (24.7)	
Fear of adverse effects	26 (19.3)		14 (15.1)	
Cost of vaccine	22 (16.3)		22 (16.3)	

Not available in government facilities	36 (26.6)		28 (30.0)	
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The most common reason across both groups was the unavailability of the vaccine in government facilities, cited by 26.6% of nursing and 30.0% of physiotherapy students (31.1% overall). This was followed by the perception that the vaccine is unnecessary (23.7% nursing, 24.7% physiotherapy), and fear of adverse effects (19.3% and 15.1%, respectively). Lack of knowledge was reported by 14.1% of nursing and 10.8% of physiotherapy students, while cost was a concern for 16.3% in both groups. Statistical analysis showed marginally significant differences in knowledge-related reasons ($\chi^2 = 9.07$, $p = 0.05$ for nursing), highlighting a need for improved awareness and accessibility (Table 4).

DISCUSSION

The present study conducted for situational analysis to identify preparedness of future health care providers (paramedical students) about HPV vaccine and cervical cancer. In the current the median age of participants in this study was 19 (IQR 2.25), ranging from 18 to 28 years. In a similar study conducted by Swarnapriya et al (6), the mean age of the participants was 19.25 years. In another study conducted by Pandey et al (7), most participants were 20 to 22 years old. The current study reported that 28.3% of students were first-year, 25.9% were second-year, 26.4% were third-year, and 19.4% were fourth-year (Table 1). In another study by Pandey et al, 44.8% were in the third and final year, while 51.2% comprised first- and second-year students (7). The current study reported that 57.1% of study participants are aware that HPV is transmitted through sexual intercourse. 49.9% of participants know that early sexual activity increases the risk of HPV infection, and 37.9% know that men can also be infected with HPV. In a study conducted by M. Alsous et al, (10) most participants (90.3%) knew that HPV is responsible for a wide array of diseases, including cervical cancer. Most of them (88.9%) were aware that HPV is transmitted sexually. Current study reported that, overall, there is positive attitude among participants on the importance and benefits of the HPV vaccine, with a majority expressing willingness to take the vaccine (52.6%) and recommending it to others (33.7%). Additionally, many participants believe that availability in government hospitals (34.8%) and inclusion in routine immunization programs (33.3%) would facilitate higher vaccine uptake. In a similar study conducted by Leung et al regarding respondents' attitudes toward HPV vaccination, more than 80% of respondents agreed that "cervical cancer is a severe disease" and 82.6% of participants believe that HPV vaccines can effectively prevent cervical cancer (8). In another study conducted by Shrestha Chowdhury et al at Bangladesh health care professional it was reported that 75.8% of participants has the positive attitude towards HPV vaccination and out of participants, 96.8% reported that they will recommend HPV vaccine to patients and 92.8 % agree that the HPV vaccine should be mandatory to girls before sexual exposure (9). Current study reported only 10.8% of participants have taken vaccine and 40.2% of participants have searched for information about vaccine. Out of all participants, 52.6% are willing to take the vaccine. In a similar study conducted by Swarnapriya et al out of the total study population only 6.08% of them have received HPV vaccination and 51.4% of participants are not willing to receive vaccination (6). In another study conducted by Leung et al in Female students attending in Hong kong universities it was found that among the study population, 47.2% of the study population has received the HPV vaccination(8). This shows higher rate of HPV vaccine uptake in developed countries than in low- and middle-income countries (LMIC) even though the burden is maximal in these countries. In another study conducted by Anirudha et al reported that only 5.2% of participants are vaccinated and 46.9% of respondents are willing to vaccinated(10). Current study reported , the primary reasons for not taking vaccines include the unavailability of the vaccine in government facilities (28.3%), fear of adverse effects (17.2%), a perceived lack of necessity (16.9%), lack of knowledge (12.5%), and cost concerns (16.3%). In a study conducted by Swarnapriya et al most common reasons for not taking the vaccine were doubts regarding the efficacy of the vaccine (30.48%), fear of side effects (26.10%) and cost of the vaccine (21.71%)(6). In another study in Jordan conducted by Alsous et al, it was found that among the obstacles that prevent the uptake of the vaccine or advice were high cost (53.8%) and inadequate information about the vaccine (62.5%)(11). In study conducted by Aldawood et al when asked about the reasons for not being willing to receive the HPV vaccine, the most common reason was not knowing enough about the vaccine (39.7%)(11). In another study conducted by Anirudha et al when enquired for the likely cause for not taking vaccine, 9.1 % of participants said that they were doubtful about the efficacy of the vaccine, 13.2 % said that they were afraid of the side effects, 4.5% of the study group said that the vaccine was too costly, 5.6% said that they are at a very low risk of getting cervical cancer(11). In another cross-sectional study conducted by G Shivani et al it was reported that 40% of study participants think that fear of side effects is a major obstacle for HPV vaccine uptake followed by doubts regarding efficacy (23%) and cost of the vaccine (14%)(12). In a study conducted by Al Shaikh et al in female university students in Saudi Arabia it was found that regarding barriers for HPV vaccination, being worried regarding side effects was the first reason (51.9%) , being afraid of the injection (26.5%) and 6.5% are skeptic in the efficiency of the vaccine , whereas family refusal was reported by 8.5% of students as a barrier to obtaining the vaccine(13). Current study reported among the study participants having awareness of HPV vaccine (49.6%) majority of are from Nursing (27.1%) and Physiotherapy (22.5%). An association between course of study and awareness of HPV vaccine and was found to be statistically significant (χ^2 value 4.59, p -value =0.03). An association between awareness about the vaccine of participants and uptake of the vaccine, which was significant (χ^2 value 21.1, p value= 0.00). An association between vaccine uptake and the course of study and was found to be statistically significant (χ^2 value 3.40, p -value =0.065). In a similar study conducted by Anirudha et al it was reported that among different fields of study medical students excelled with having

good knowledge, a positive attitude, and good practices this was followed by nursing students, with significant associations between study fields and knowledge ($p=0.0001$), attitude ($p=0.0018$), and practices ($p=0.0011$)(13).

Strengths and Limitations

The strength of study was that this study has covered medical and paramedical students as they are future healthcare providers and they will serve as role models. This is a study based in a tertiary health care center in an urban setting, which may not be representative or applicable to all paramedical colleges. To ensure the generalizability of the results, a multi-centric study involving multiple paramedical colleges is necessary. Future research should focus on adolescent boys and key populations for HIV (Men Sex with Men, Female Sex Worker & Intravenous Drug User).

CONCLUSION

It was found that knowledge and practice of cervical cancer and HPV vaccine among paramedical students was low. The majority of them are willing to take the vaccine and recommend it to others. The practice of vaccination among paramedical students is poor. Among vaccinated individuals, they state that awareness of cervical cancer and HPV vaccine and suggestions by doctors are the main reasons for taking the vaccine. This highlights the prominent role of healthcare professionals in public awareness of cancer information and the HPV vaccine. The reasons found for not taking the vaccine through this study can be categorized as lack of knowledge about cervical cancer and the HPV vaccine, the unavailability of the vaccine in government facilities, fear of adverse effects, a perceived lack of necessity, and cost concerns.

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