

Awareness, Perceptions, and Practices Regarding Human Papillomavirus Vaccination

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Abstract

Introduction: Cervical cancer remains a significant cause of cancer-related deaths among women worldwide, with India accounting for roughly 25% of all cases across the globe. In India, females have a roughly 1 in 53 chance of developing cervical cancer during their lifetime, which is significantly higher than the 1 in 100 risk observed in more economically advanced nations. Approximately 15% of human cancers are caused by virus infections, with cervical cancer being predominantly attributed to high-risk Human Papillomavirus (HPV) strains, particularly types 16 and 18, which account for 75-80% of cases worldwide. HPV vaccination stands as the most effective method for cervical cancer prevention.

Methods: Researchers conducted a cross-sectional investigation at a private medical school, enrolling 248 participants. The study gathered information on the participants' demographic characteristics and their understanding, perspectives, and behaviours concerning HPV vaccination for preventing cervical cancer. Researchers input the collected data into Microsoft Excel and performed analysis using SPSS.

Results: The participants consisted of 140 females (56.5%) and 108 males (43.5%). A large majority of the subjects, 201 (81%), recognized the highly contagious nature of HPV infection. Additionally, 206 participants (83%) were cognizant that cancers associated with HPV can be prevented. Nevertheless, knowledge about HPV's cancer-causing potential in men was limited, with just 19.4% being aware. Likewise, only 22.6% of students knew the correct vaccine dosing schedule. Concerning vaccination status, 36 individuals (14.5%) had completed the full course, 20 (8%) had received partial vaccination, and 106 (42.7%) indicated their readiness to get vaccinated in the future.

Conclusion: Although medical students demonstrated strong understanding and favorable views towards HPV and its vaccine, the actual uptake of vaccinations was considerably lower than anticipated. This gap highlights the vital need for educational initiatives and awareness campaigns to increase HPV vaccination rates, thereby strengthening efforts to fight cervical cancer in India.

Keywords: Knowledge, Attitude, Practice, Human papilloma virus vaccination, Medical students

Introduction

Worldwide, cervical cancer remains a leading contributor to cancer deaths among women, with a particularly severe impact on developing countries like India. The nation accounts for roughly one-

fourth of cervical cancer incidents globally. Women in India are at greater risk, with the likelihood of developing cervical cancer being 1 in 53 during their lifetime, in contrast to 1 in 100 women in more developed nations. [1,2] Approximately 15% of all malignancies in humans are linked to viral infections, positioning them as a significant contributor to cancer rates worldwide. [3] Globally, 75-80% of cervical cancer instances are linked to infections by high-risk (HR) Human Papillomavirus (HPV) strains, particularly types 16 and 18, which are the most common. [4] HPV type 16 is especially common in India. The country experiences roughly 132,000 new cases of cervical cancer and 80,000 related deaths each year. [5]

Research suggests that approximately 75% of sexually active adults will likely acquire at least one form of HPV during their lifetime. Throughout an individual's life, the chance of contracting a genital HPV infection range from 50% to 80%, with approximately 5% of these cases resulting in genital warts. For women who receive regular screenings, the odds of encountering abnormal Pap smear results are about 35%, while the probabilities of developing Cervical Intraepithelial Neoplasia and invasive cervical cancer are roughly 20% and 1%, respectively. On the other hand, women who skip regular screenings have a substantially higher chance of developing cervical cancer, with the risk potentially reaching 4%. [6,7]

The identification of HPV as the main causative factor in almost all cases of cervical cancer has opened doors for new preventive strategies. [8,9] To prevent genital HPV infections, individuals can engage in monogamous relationships or practice sexual abstinence. Although commonly used, barrier methods of contraception like condoms do not guarantee complete protection against HPV. The most effective approach to prevention is considered to be HPV vaccination, especially since cervical screening only identifies changes after they have already occurred. [10]

In 2006, the first HPV vaccine was introduced, and within a decade, it had become part of standard immunization programs in 71 nations, primarily focusing on females. The vaccine has received WHO prequalification and is now considered an essential medicine. [11–14] Two vaccine options are legally accessible in India: the quadrivalent Gardasil™ from Merck and the bivalent Cervarix™ from GlaxoSmithKline. Gardasil™ is designed to offer protection against HPV types 16, 18, 6, and 11, and incorporates an aluminum-based adjuvant. In contrast, Cervarix™ targets types 16 and 18, utilizing an AS04 adjuvant in its formulation.

These immunizations serve as preventative measures rather than curative treatments. They are delivered through a 0.5 mL shot into the muscle, typically in the upper arm or outer thigh area. The vaccines are most effective when given between ages 9 and 12, though additional shots can be administered up to age 26. The immunization schedules for the two vaccines are distinct: Gardasil™ requires a three-dose series administered at 0, 2, and 6 months, whereas Cervarix™ follows a 0, 1, and 6 month protocol, with specific time gaps between each dose.

In India, where adherence to Pap smear screenings is low, HPV vaccination has become a vital public health strategy. The vaccines have demonstrated both safety and effectiveness. For individuals who can afford it, the Indian Academy of Paediatrics Committee on Immunization (IAPCOI) recommends the HPV vaccine, stressing its significance when administered prior to the beginning of sexual activity to ensure optimal protection. Likewise, the Federation of Obstetric and Gynaecological Societies of India (FOGSI) strongly supports HPV vaccination, especially in private healthcare facilities. [15–17] The concept of using vaccines to fight cancer is a relatively new approach, and its success largely depends

on how patients and healthcare professionals perceive and understand it. As future leaders in healthcare, medical students play a vital role in promoting and educating about HPV vaccination across diverse populations in India. This study aims to evaluate the knowledge, attitudes, and practices regarding HPV vaccination among students enrolled in a private medical college in Tamil Nadu. Additionally, it seeks to identify the factors that influence these aspects.

Objectives

To assess the Awareness, Perceptions, and Practices Regarding Human Papillomavirus Vaccination among Students in a Private Medical College in Tamil Nadu.

Methodology

This research employs a cross-sectional design, focusing on medical college students and interns. The study population comprises individuals who were available during the data collection period and provided informed consent to participate. Those who declined to give consent were excluded from the study. The research was conducted within the confines of the medical college, involving only its students and interns. The research was carried out at a private medical college in Tamil Nadu using a single institutional study approach. All students and interns meeting the inclusion criteria were included, resulting in a sample size of 248 participants. Data collection involved obtaining informed consent followed by interviews. The researchers utilized a semi-structured questionnaire, developed after a literature review, to gather information over one month.

Data analysis: Microsoft Excel was utilized for data entry and coding, while Statistical Package for Social Sciences (SPSS) version 24.0 was employed for analysis. Proportions were used to present categorical data. To determine statistical significance, the Chi Square test was applied, with $p \leq 0.05$ considered significant. Ethical protocols were followed in this study. The Institutional Ethics Committee approved the research. Study participants provided informed consent and were assured of anonymity and confidentiality. Their involvement was entirely voluntary, and all responses were treated with strict confidentiality.

Results

This study was conducted on 248 medical students, of whom 140(56.5%) were Females and 108(43.5%) were Males.

Table 1: Distribution of Study subjects according to year of study (n=248):

Year of study	Frequency(n)	Percentage (%)
First year	34	13.7
Second year	136	54.8
Pre-final year	26	10.5
Interns	52	21.0

The distribution of participants based on their year of study shows that the majority were second-year students, accounting for 54.8% (n=136) of the total sample. This was followed by interns, who represented 21% (n=52) of the participants. First-year students made up 13.7% (n=34), while the pre-final year students constituted the smallest group at 10.5% (n=26). This distribution indicates that more than half of the participants were in their second year of study, suggesting higher involvement or accessibility of students at this academic level compared to other years.

Table 2: Knowledge about HPV infection among the Study participants (n=248):

Knowledge about HPV infection among Study Participants		Male n(%)	Female	P value
Hpv infection causes Cervical cancer	True	96(88.9)	105(75)	0.003*
	False	8(7.4)	32(22.9)	
	Don't know	4(3.7)	3(2.1)	
Which gender is affected most commonly by HPV infection?	Males	18(16.7)	30(21.4)	0.482
	Females	86(79.6)	102(72.9)	
	Don't know	4(3.7)	8(5.7)	
Cancer caused by HPV infection is preventable?	Yes	94(87)	112(80)	0.0001*
	No	4(3.7)	28(20)	
	Don't know	10(9.3)	-	

*p<0.05 is significant.

The study assessed participants' knowledge of HPV infection. A significantly higher proportion of males (88.9%) correctly identified that HPV infection causes cervical cancer compared to females (75%), with a significant difference ($p=0.003$). When asked about the gender most affected by HPV infection, more males (79.6%) and females (72.9%) correctly identified females as being most affected, though the gender difference was not statistically significant ($p=0.482$). Regarding the preventability of HPV-related cancer, 87% of males and 80% of females correctly agreed that it is preventable, with a significant difference ($p=0.0001$).

Table 3: Knowledge about HPV Vaccination among the study participants (n=248):

Knowledge about HPV vaccination among Study Participants		Male n(%)	Female n(%)	P value
What is the ideal time to give HPV vaccines	Before sexual exposure	72(66.7)	92(65.7)	0.843
	After sexual exposure	8(7.4)	8(5.7)	
	Anytime from birth	20(18.5)	30(21.4)	
	Don't know	8(7.4)	10(7.2)	
How many doses of HPV vaccines are required for protection	Single dose	18(16.7)	20(14.3)	0.0001*
	Two doses	66(61)	68(48.6)	
	Three doses	10(9.3)	46(32.9)	
	Don't know	14(13)	6(4.2)	

*p<0.05 is significant.

The study assessed participants' knowledge of HPV vaccination. Most male (66.7%) and female

(65.7%) participants correctly recognized that the ideal time to receive the vaccine is before sexual exposure, with no significant gender difference ($p=0.843$). However, regarding the number of doses required for protection, a significant gender difference was found ($p=0.0001$). While a majority of males (61%) thought two doses were sufficient, more females (32.9%) correctly identified that three doses are needed. Additionally, a considerable number of participants, both male (16.7%) and female (14.3%), mistakenly believed a single dose was adequate.

Table 4: Attitude about HPV Vaccination among Study Participants (n=248):

Attitude about HPV Vaccination among Study Participants		Male n(%)	Female n(%)	P value
There is a chance that I may be infected by HPV in the future	Agree	40(37)	64(45.7)	0.516
	Disagree	68(63)	76(54.3)	
HPV vaccines can effectively prevent cervical cancer	Agree	90(83.3)	116(82.8)	0.541
	Disagree	18(16.7)	24(17.2)	

* $p<0.05$ is significant

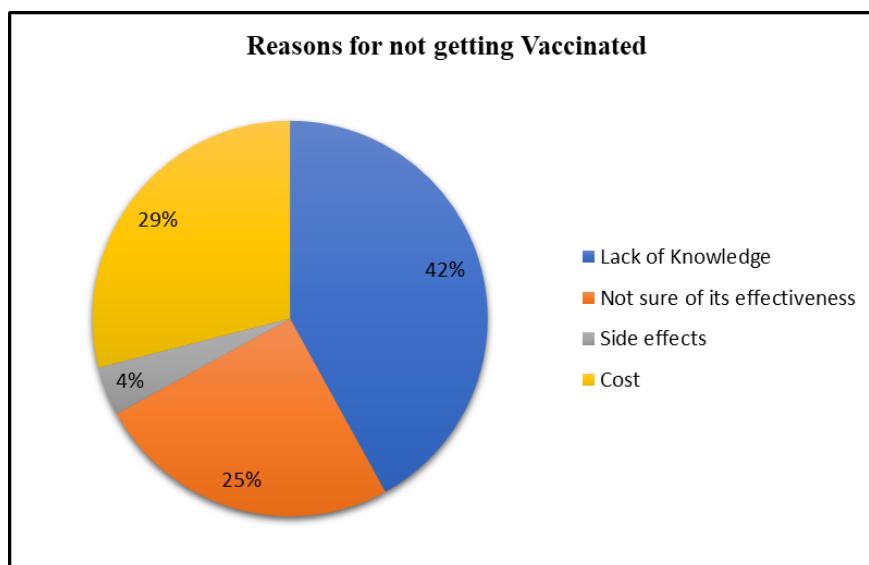
The study assessed the attitudes towards HPV vaccination among male and female participants. Regarding the perception of potential future HPV infection, 37% of males and 45.7% of females agreed, with no significant difference between genders ($p=0.516$). When asked about the effectiveness of the HPV vaccine in preventing cervical cancer, 83.3% of males and 82.8% of females agreed, showing no significant gender difference ($p=0.541$). Both attitudes reflect a generally positive view toward the vaccine, but gender differences were not statistically significant.

Table 5: Practice about HPV Vaccination among Study Participants (n=248):

Practice about HPV vaccination		Frequency	Percentage
Are you vaccinated	Yes	36	14.5%
	No	212	85.5%

Among the participants, only 36 students (14.5%) reported practicing HPV vaccination, while a significant majority, 212 students (85.5%), had not been vaccinated. This highlights a considerable gap between awareness and the actual uptake of the vaccine.

Figure 1: Pie diagram showing Reason for not getting Vaccinated (n=248)



Discussion

The present study demonstrates that a substantial proportion of participants possessed awareness regarding HPV infection and its prevention. In this study, 87% of men and 80% of women were aware that HPV infection is preventable. These findings are consistent with earlier research conducted by Singh et al. [18], who reported an awareness level of 82% among their study participants. Similarly, higher awareness levels were reported by Jyotsna et al. [19], where 97% of students acknowledged the preventability of HPV infection.

Furthermore, the present study revealed that 88% of men and 75% of women were aware that HPV infection is a leading cause of cervical cancer. These findings are in agreement with the observations reported by Gollu et al. [20], who documented awareness levels of 95% among males and 98% among females regarding the association between HPV infection and cervical cancer. However, awareness regarding the role of HPV infection in causing cancer among males was notably lower in the present study, with only 16.7% of men and 21.4% of women being aware of this association. This finding is considerably lower than that reported by Amit Kumar et al. [21], who observed a 52.5% awareness level, indicating a significant gap in understanding the broader oncogenic potential of HPV, particularly among males.

With regard to vaccination, the present study found that 83.3% of men and 82.8% of women believed that HPV vaccination can prevent cervical cancer. These findings support the observations of Amit Kumar et al. [21], who reported awareness levels of 64% among men and 75% among women. Despite the relatively high level of knowledge regarding HPV vaccination, actual vaccine uptake remained low. In the present study, only 14% of female participants had received the HPV vaccine. This figure is marginally higher than that reported by Rashid et al. [22], where only 7% of female participants were vaccinated. This discrepancy between awareness and vaccine uptake highlights the need for targeted educational initiatives, improved accessibility to vaccination services, and stronger public health strategies to enhance HPV immunization coverage.

Conclusion

The current research found that 42% of students cited a lack of knowledge as the reason for not receiving vaccination, which aligns with findings from Amit Kumar et al.²¹. This similarity suggests a gap in students' understanding of HPV vaccination.

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