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Knowledge, Attitudes, and Vaccination Practices Related to Human Papillomavirus Among MBBS Students

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Abstract

Background: Cervical cancer is the fourth most common cancer among women worldwide and a major public health concern in India. Human papillomavirus (HPV), a sexually transmitted DNA virus, is strongly associated with cervical cancer and other malignancies. Vaccination is an effective preventive strategy, yet awareness and acceptance among future healthcare professionals remain crucial.

Objective: To assess the knowledge and attitudes of MBBS students at Post Graduate Institute of Medical Sciences, Rohtak, regarding HPV infection and their willingness to receive HPV vaccination.

Methods: A cross-sectional study was conducted among MBBS students to evaluate their understanding of HPV, its association with cancers, and their acceptance of HPV vaccination.

Results: The study assessed students' awareness of HPV transmission, associated cancers, and vaccination recommendations, along with their attitudes toward vaccination uptake.

Conclusion: Evaluating knowledge and attitudes among medical students can help identify gaps and guide targeted educational interventions to improve HPV awareness and vaccination acceptance.

Keywords: HPV • Cervical cancer • HPV vaccination • Knowledge and attitude • Medical students

Introduction

Cervical cancer is the fourth most common cancer among women globally (1). Human papillomavirus (HPV) is a non-enveloped, double-stranded, circular DNA virus of the Papillomaviridae family. The virus enters the epithelium through disruption to the skin/mucosa and infects basal stem cells. HPV is a very common viral infection that spreads mainly through skin-to-skin sexual contact. It is a sexually transmitted disease and is associated with cancers such as cervical cancer, head and neck squamous cell carcinoma (HNSCC), and anal cancer (2).

In India, cervical cancer is the third most common cancer, with an incidence rate of 18.3%, and the associated mortality is the second highest, with a rate of 9.1%. The age-standardised prevalence rate in India is 14.7 per 100,000 women, with a death rate of 9.2 per 100,000 women (3).

HPV is a DNA virus belonging to the Papillomavirus family, with more than 100 types identified. Depending on oncogenic potential, various mucosal HPV types are categorized as either high-risk (oncogenic) HPV types, which can be potentially carcinogenic (e.g., HPV 16, 18, 31, and 33), or low-risk (non-oncogenic) HPV types, which are mostly found in warts (e.g., HPV 6 and 11) (4). To prevent lower anogenital tract HPV infection by the most common high-risk and low-risk subtypes, the Centers for Disease Control and Prevention (CDC) recommends that boys and girls be vaccinated starting at ages 11 to 12 years. It is further recommended that women receive vaccination up to the age of 26 and men up to the age of 21 (5).

The aim of this study was to assess the knowledge and attitudes of MBBS students at Post Graduate Institute of Medical Sciences Rohtak towards HPV and whether they would opt for vaccination.

Materials and Methods

A quantitative, observational, cross-sectional study was conducted among 200 MBBS students at Pt. B. D. Sharma Post Graduate Institute of Medical Sciences Rohtak (PGIMS), Rohtak. The study participants were selected using a probability sampling method, ensuring that everyone in the population had an equal chance of being included in the study. Data were collected using a self-administered questionnaire, which was distributed to all selected participants.

The questionnaire was designed to gather relevant information as per the study objectives. This included information on participants' age, level of education, parents' level of education, and socioeconomic status using BG Prasad classification (6), as well as knowledge regarding HPV, cervical cancer, the HPV vaccine, and attitudes toward vaccination.

The collected data were entered into and analysed using IBM SPSS Statistics version 23. Descriptive statistics were used to summarize the data, and frequencies were calculated for categorical variables. The Chi-square test was applied to assess the association between variables (bivariate analysis).

Individuals who did not give informed consent to participate in the study and those with incomplete or improperly filled questionnaires were excluded from the final analysis. Informed consent was obtained from all participants before data collection.

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Results

Out of 200 study participants, the age range was 17–25 years, and the mean age was 18.42 ± 1.24 years.

Knowledge Regarding Cervical Cancer: Out of the total participants, 100% reported that they had heard of HPV. Almost all respondents correctly identified that HPV infection can cause cervical cancer and genital warts, while a small proportion (2.8%) were unaware of its consequences. Regarding transmission, a significant number (97%) recognized sexual contact as the main mode, whereas some participants (3%) had misconceptions such as blood transfusion or lacking knowledge. A total of 98% of participants were aware that a vaccine is available for HPV prevention.

Regarding knowledge about cervical cancer, 120 participants (60%) correctly reported that all women are at risk of developing cervical cancer, while 80 (40%) were unsure. When asked about the nature of the disease, 90 participants (45%) identified that cervical cancer can be asymptomatic in early stages, whereas 110 (55%) did not know. Concerning symptoms, 80 participants (40%) recognized weight loss as a possible symptom, while 120 (60%) were unsure. Additionally, 110 participants (55%) reported lower abdominal pain as a symptom of cervical cancer. Overall, the findings indicate moderate awareness, with noticeable gaps in knowledge regarding early asymptomatic presentation and symptom recognition.

However, knowledge regarding the ideal age for vaccination varied, with 83.8% correctly identifying 9–14 years, while 16.7% selected older age groups or were unsure. Knowledge about the number of doses required was inconsistent; 63.5% were aware, while 27.5% provided varying responses (1, 2, or 3 doses), and a notable proportion did not know the correct schedule.

Using the Likert scale, a large proportion of participants agreed that the HPV vaccine is safe (70%) and effective (72.5%), and 60% supported mandatory vaccination for adolescents. Around 70% showed willingness to get vaccinated or to future

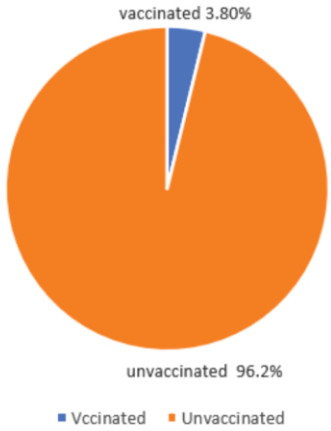

Figure 1: HPV Vaccination Status

children. Regarding the myth statement, 55% disagreed, indicating relatively good awareness, although 25% still believed or were unsure, highlighting gaps in knowledge. This suggests not only low uptake but also incomplete vaccination among those who initiated the vaccine series.

Among the participants who had not received the HPV vaccine (n = 192), the most reported reason was lack of awareness, accounting for 80 participants (41.7%). This was followed by cost, reported by 40 participants (20.8%), indicating financial constraints as a significant barrier. Additionally, 30 participants (15.6%) cited fear of side effects, while 20 participants (10.4%) reported social stigma as a reason for non-vaccination. Furthermore, 22 participants (11.5%) mentioned that the vaccine was not recommended by a doctor.

Overall, lack of awareness emerged as the predominant barrier, followed by economic and perception-related factors. Regarding the source of HPV-related information, the majority of

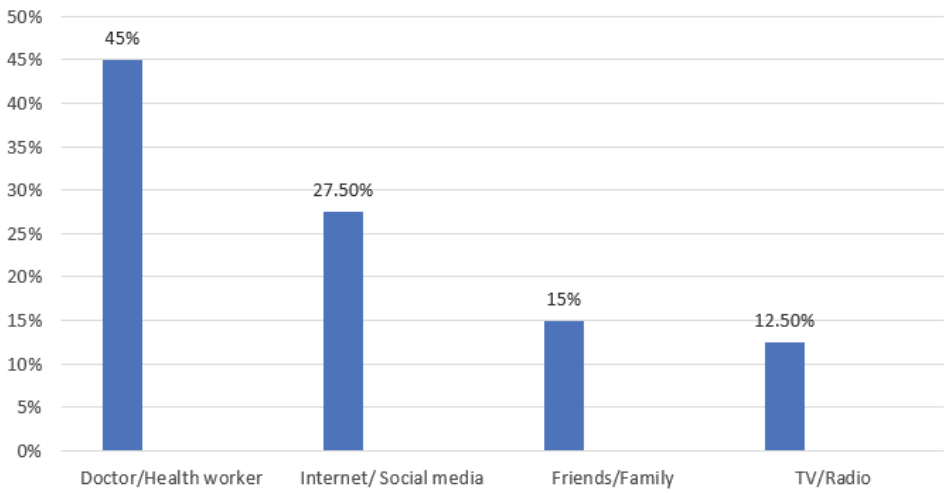

Figure 2: Source of HPV related information

participants reported doctors/healthcare workers as their primary source (45%). This was followed by internet/social media (27.5%), friends/family (15%), and TV/radio (12.5%).

Despite healthcare professionals being the most common source of information, the overall HPV vaccination uptake remained low, indicating a gap between awareness and actual vaccination practices.

Discussion

The present study assessed knowledge, attitudes, and practices regarding HPV infection and vaccination among young participants aged 17–25 years. The mean age of 18.42 ± 1.24 years indicates that the study population largely consisted of late adolescents and young adults, an important target group for HPV vaccination programs.

In the current study, awareness of HPV was very high (100%), which is comparatively higher than findings reported by Shazia Rashid et al. (7) (2016), where awareness of HPV among college students was only around 45–46%, and knowledge about HPV vaccines was about 44%. This difference may be attributed

to increased exposure to health information through digital media and recent public health initiatives.

The present study demonstrated high awareness regarding HPV vaccination, with 98% of participants knowing about vaccine availability and 83.8% correctly identifying the ideal vaccination age (9–14 years). However, knowledge regarding the number of doses was inconsistent (63.5%), indicating partial understanding. Similar findings have been reported by Shazia Rashid et al. (7), where general awareness about HPV vaccination was present, but detailed knowledge regarding dosage and schedule was limited.

Regarding cervical cancer knowledge, only 60% of participants recognized that all women are at risk, and a substantial proportion lacked awareness about the asymptomatic nature of early-stage disease (55%). Comparable findings were reported in a study by Sabeena S et al. (8) (2017), where knowledge about symptoms and early detection of cervical cancer was found to be insufficient.

The attitude assessment in the present study revealed a positive perception toward HPV vaccination, with 70% considering it safe and 72.5% effective, and 60% supporting mandatory vaccination. Around 70% were willing to get vaccinated or vaccinate their child. These findings are consistent with studies such as Mehrotra R et al. (9), which reported moderate to high willingness despite variable knowledge levels.
Despite adequate knowledge and positive attitudes, the actual vaccination uptake in this study was extremely low (3.8%), which is consistent with several Indian studies reporting poor coverage. For instance, a study among healthcare professionals by Sathish Kumar et al. (10) (2021) reported uptake around 19.8%, which is still relatively low but higher than the present findings.

The major barriers identified—lack of awareness (41.7%), cost (20.8%), and fear of side effects (15.6%)—are in line with findings from multiple Indian and global studies. Literature consistently identifies financial constraints, misinformation, and lack of strong healthcare provider recommendation as key determinants of low vaccine uptake. Notably, even though 45% of participants reported doctors/health workers as their primary information source, vaccination rates remained low.

Conclusion

Overall, the present study reinforces existing evidence that although awareness and attitudes toward HPV vaccination are improving, actual vaccine uptake remains inadequate. This indicates that improving knowledge alone is not sufficient; there is a need for multifaceted interventions, including strengthening health education, reducing vaccine cost, addressing myths and stigma, and enhancing proactive engagement by healthcare providers.

Ethical Approval

Ethical approval for this study was obtained from the Institutional Ethics Committee prior to the commencement of the study. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and applicable institutional guidelines.

Informed Consent

Written informed consent was obtained from all participants prior to their enrolment in the study.

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Conflict of Interest Declaration

The authors declare no conflict of interest.

Data Availability Statement

All data generated or analysed during this study are available from the corresponding author upon reasonable request.

Author Contributions

Conceptualization: Priya Punyani, Annpurna Jangra;
Methodology: Priya Punyani
Data Collection: Annpurna Jangra, Vishal Naresh;
Data Analysis and Interpretation: Priya Punyani, Aman Sachdeva;
Writing – Original Draft Preparation: Annpurna Jangra;
Writing – Review & Editing: Priya Punyani, Aman Sachdeva, Vishal Naresh;
Supervision: Priya Punyani.

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AI & AI-Assisted Tool Disclosure

Artificial Intelligence (AI)-based tools were used solely for grammar checking, language editing, and formatting purposes. The authors take full responsibility for the accuracy, integrity, and originality of the manuscript content.

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