



RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS HUMAN PAPILLOMAVIRUS (HPV) VACCINATION AMONG MEDICAL STUDENTS AT A TERTIARY HOSPITAL: A CROSS-SECTIONAL STUDY

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Abstract

Background: Human papillomavirus (HPV) is a major cause of cervical cancer and other HPV-related diseases. Vaccination against HPV is an effective public health measure, yet the awareness and uptake of the HPV vaccine remain low in several populations. This study assesses the knowledge, attitude, and practice (KAP) regarding HPV vaccination among medical students, who play a critical role in public health promotion.

Methods: This cross-sectional study was conducted at a tertiary hospital from June 2024 to September 2024, involving 500 medical students selected through convenient sampling. A structured questionnaire was used to assess the students' knowledge of HPV, their attitudes toward vaccination, and their vaccination practices.

Results: The results revealed gaps in knowledge about HPV and its vaccination. Only 23.2% of students correctly identified HPV as the primary cause of cervical cancer, and 31.8% knew that HPV types 16 and 18 are the most commonly associated with cervical cancer. A considerable portion (35.6%) was unsure of the vaccine's effectiveness, and 49% had received the HPV vaccine themselves. Participation in awareness programs was higher, with 55.2% of students involved. Cost and lack of information were identified as major barriers to vaccination, with 19.6% of students considering cost a significant obstacle and 52.4% reporting a lack of integration of HPV education into the medical curriculum.

Conclusion: This study highlights significant gaps in knowledge and varying attitudes towards HPV vaccination among medical students. While awareness is moderate, there is a need for improved educational efforts and the integration of HPV vaccination topics into the medical curriculum. Addressing barriers such as cost and misinformation is essential for promoting higher vaccination uptake and preparing future healthcare providers to advocate for HPV prevention.

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Introduction:-

Human papillomavirus (HPV) is the most prevalent sexually transmitted infection worldwide (1). A large proportion of sexually active individuals will contract HPV at some point in their lives, though the immune system often clears the infection without medical intervention (2). However, approximately 20% of infections persist for an extended period, significantly increasing the risk of developing malignancies, particularly cancers of the genital tract, with cervical cancer being the most common (3). The global prevalence of HPV remains substantial, with a meta-analysis estimating an infection rate of 10.4% among women with normal cervical cytology. Notably, Africa recorded the highest prevalence at 22.1% (4). The presence of HIV, which is highly endemic in sub-Saharan Africa (SSA), exacerbates the progression and prognosis of HPV infection (5). Women living with HIV are up to six times more likely to develop cervical cancer compared to HIV-negative individuals (6,7). In Zambia, HIV disproportionately affects women of reproductive age (15-49 years), with a higher prevalence than in men (8). This contributes to an elevated incidence of cervical cancer, which stands at 66.4 cases per 100,000 women-years (9). Despite Zambia being a regional leader in cervical cancer control (10), the disease remains highly prevalent. The country has offered free national cervical cancer screening since 2006, ensuring accessibility across all provinces; however, multiple challenges at both the individual and systemic levels lead to delayed diagnoses and hinder timely treatment (10,11).

The introduction of the HPV vaccine has been a significant milestone in cervical cancer prevention, with prequalification by the World Health Organization (WHO) in 2006. Many high-income countries have effectively integrated HPV vaccination into their national immunization programs and are now experiencing measurable benefits. A meta-analysis of data from fourteen high-income nations reported an 83% reduction in the prevalence of HPV types 16 and 18 among girls aged 13-19 years and a 66% reduction among women aged 20-24 years, with substantial cross-protection against HPV types 31, 33, and 45 (12). However, low- and middle-income countries (LMICs), where HPV burden is highest, remain significantly underserved. Global estimates indicate that only 1% of the 118 million women targeted for HPV vaccination programs were from LMICs (13). Expanding vaccination coverage through targeted strategies is essential to achieving herd immunity and reducing HPV-related morbidity and mortality.

To address cervical cancer prevention, Zambia launched the Cervical Cancer Prevention Program in 2006, initially focusing on high-risk HIV-infected women before expanding to include the general population. The program utilized various screening methods for early detection and management. In 2019, the country introduced a free National HPV vaccination program targeting 14-year-old girls (14) as part of efforts to mitigate the high burden of cervical cancer (15). The vaccine is delivered through schools, healthcare facilities, and community outreach posts (16). While the initial coverage was promising at 75%, it declined sharply to 33% by 2021. This decline was attributed to several factors, including widespread myths and misconceptions about the HPV vaccine—particularly concerns about infertility—fear of potential side effects, and limited public awareness. Additionally, the absence of prior community engagement to address cultural barriers before the vaccine rollout exacerbated vaccine hesitancy, a situation further worsened by school closures during the COVID-19 pandemic (16). These figures fall significantly short of the World Health Organization (WHO) cervical cancer elimination strategy, which aims to have at least 90% of 15-year-old girls fully vaccinated by 2030 (17).

A critical approach to increasing HPV vaccine uptake is medical doctors' active recommendation, as they serve as key influencers in parental vaccination decisions (18). For instance, a study conducted among women attending antenatal clinics in Johannesburg found that a doctor's recommendation was the most significant factor influencing their decision to vaccinate their children (19). Similarly, research conducted in the United States has consistently demonstrated that physician recommendations are among the strongest predictors of HPV vaccine uptake in both girls (20) and boys (21). A systematic review assessing barriers to HPV vaccination among U.S. adolescents reported that parents consistently identified healthcare provider recommendations as the most critical factor in their decision to vaccinate their children. Consequently, it is imperative for medical doctors to possess adequate knowledge to confidently endorse the HPV vaccine to their patients (22). Knowledge plays a vital role in fostering trust-based doctor-patient relationships (23), and previous studies indicate that variations in physicians' knowledge negatively impact their willingness to recommend vaccines (24,25).

This study aims to assess the Knowledge, Attitude, and Practice (KAP) of medical students at a tertiary hospital regarding HPV vaccination. It seeks to evaluate their awareness levels, existing misconceptions, and their

willingness to advocate for HPV vaccination in their future medical practice. The findings will provide valuable insights for integrating HPV vaccine education into medical curricula and enhancing vaccination uptake, ultimately contributing to improved cervical cancer prevention efforts.

Materials and Methods:-

This cross-sectional study was conducted from June 2024 to September 2024 in the Department of Obstetrics and Gynaecology at F.H. Medical College, Etmadpur, Agra. The study population consisted of 500 medical students, selected through convenient sampling. Students were informed about the study's objectives, and only those who provided informed consent were included. Data collection was carried out using a structured questionnaire designed to evaluate three key domains: knowledge about HPV and its vaccine, attitudes towards HPV vaccination, and vaccination practices. The questionnaire included a combination of multiple-choice and Likert-scale questions, covering topics such as the primary cause of cervical cancer, types of HPV associated with cervical cancer, modes of transmission, vaccine effectiveness, safety, and the willingness of students to advocate for vaccination.

The collected data were analyzed using SPSS version 26. Descriptive statistics, such as frequencies and percentages, were utilized to summarize the results. To explore the relationship between demographic variables and KAP scores, chi-square tests were applied, with statistical significance set at $p < 0.05$. This approach helped in identifying key trends and associations in the KAP of medical students regarding HPV vaccination.

Results:-

The study included a total of 500 medical students from F.H. Medical College, Etmadpur, Agra. The results are presented in three categories: knowledge, attitude, and practices regarding HPV vaccination.

1. Knowledge about HPV and its Vaccine

The students demonstrated varying levels of knowledge about HPV and its role in causing cervical cancer. Only 23.2% (n=116) of the students correctly identified HPV as the primary cause of cervical cancer. A significant portion of students misidentified the cause, with 25.2% (n=126) attributing it to Epstein-Barr Virus (EBV), 25.6% (n=128) to Hepatitis B Virus (HBV), and 26% (n=130) to HIV.

When asked about the HPV types most commonly associated with cervical cancer, 36.2% (n=181) incorrectly identified HPV types 31 and 33. Only 31.8% (n=159) of the students correctly identified HPV types 16 and 18 as the ones most commonly associated with cervical cancer, and 32% (n=160) thought that HPV types 6 and 11 were responsible.

Table 1:- Knowledge of HPV and Cervical Cancer Among Medical Students.

Knowledge Parameters	Number	Percentage
Correct identification of HPV as a cause	116	23.2%
Correct identification of HPV types (16, 18)	159	31.8%
Incorrect identification of other viruses	379	75.8%

Regarding the mode of transmission of HPV, only 23.6% (n=118) of students recognized sexual contact as the primary mode of transmission. A considerable proportion of students, 27.4% (n=137), mistakenly believed that HPV is transmitted via airborne transmission, while 23% (n=115) thought it spreads through blood transfusion, and 26% (n=130) through sharing personal items.

Awareness about the asymptomatic nature of HPV infection was also limited. 32.6% (n=163) of students correctly identified that HPV can be asymptomatic, while 32% (n=160) were unsure, and 35.4% (n=177) believed HPV infection always presents with symptoms.

Figure 1: Participation in HPV Awareness Programs

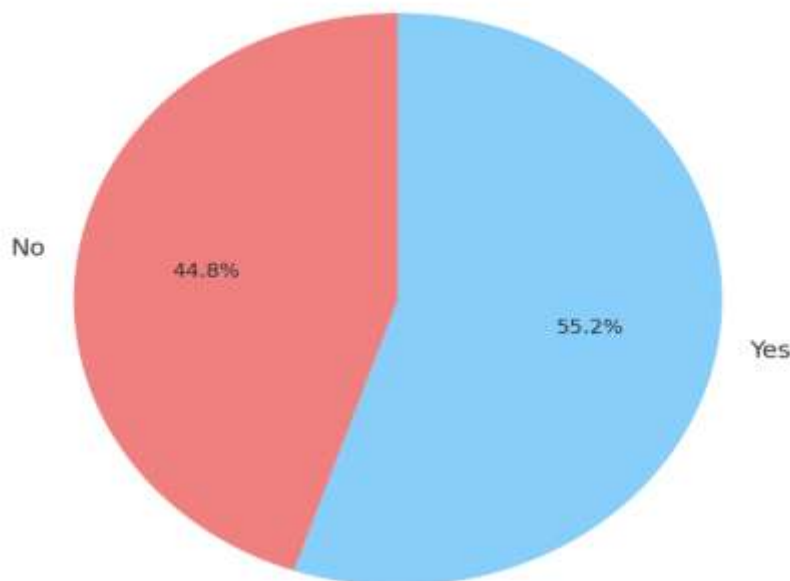


Figure 1:- Participation in HPV Awareness Programs.

2. Attitude Towards HPV Vaccination

The students' attitudes toward HPV vaccination revealed mixed opinions about its effectiveness and role in preventing cervical cancer. When asked about the effectiveness of the vaccine, only 30.8% (n=154) believed that HPV vaccines are effective, while 35.6% (n=178) were unsure, and 33.6% (n=168) did not believe the vaccines were effective.

Regarding the recommended age for HPV vaccination, 29.4% (n=147) of students thought the vaccine should be administered after the age of 25, while 24.6% (n=123) recommended vaccination between the ages of 15 and 19, 24.4% (n=122) between 20 and 25 years, and 21.6% (n=108) correctly identified the age range of 9-14 years as the ideal time for HPV vaccination.

When asked about the number of doses required for full HPV vaccination, 52.4% (n=262) of students correctly identified that two doses are required, while 47.6% (n=238) believed that three doses are necessary.

Table 2:- Attitude Towards HPV Vaccination.

Attitude Parameters	Number	Percentage
Belief in the effectiveness of the vaccine	154	30.8%
Support for mandatory vaccination	166	33.2%

The students showed uncertainty about HPV vaccination's role in public health. Only 26.6% (n=133) believed that the vaccine significantly contributes to herd immunity, while 24.4% (n=122) thought it has no contribution. A notable proportion of students, 35.8% (n=179), did not support making HPV vaccination mandatory for eligible females, while 33.2% (n=166) supported mandatory vaccination, and 31% (n=155) were unsure.

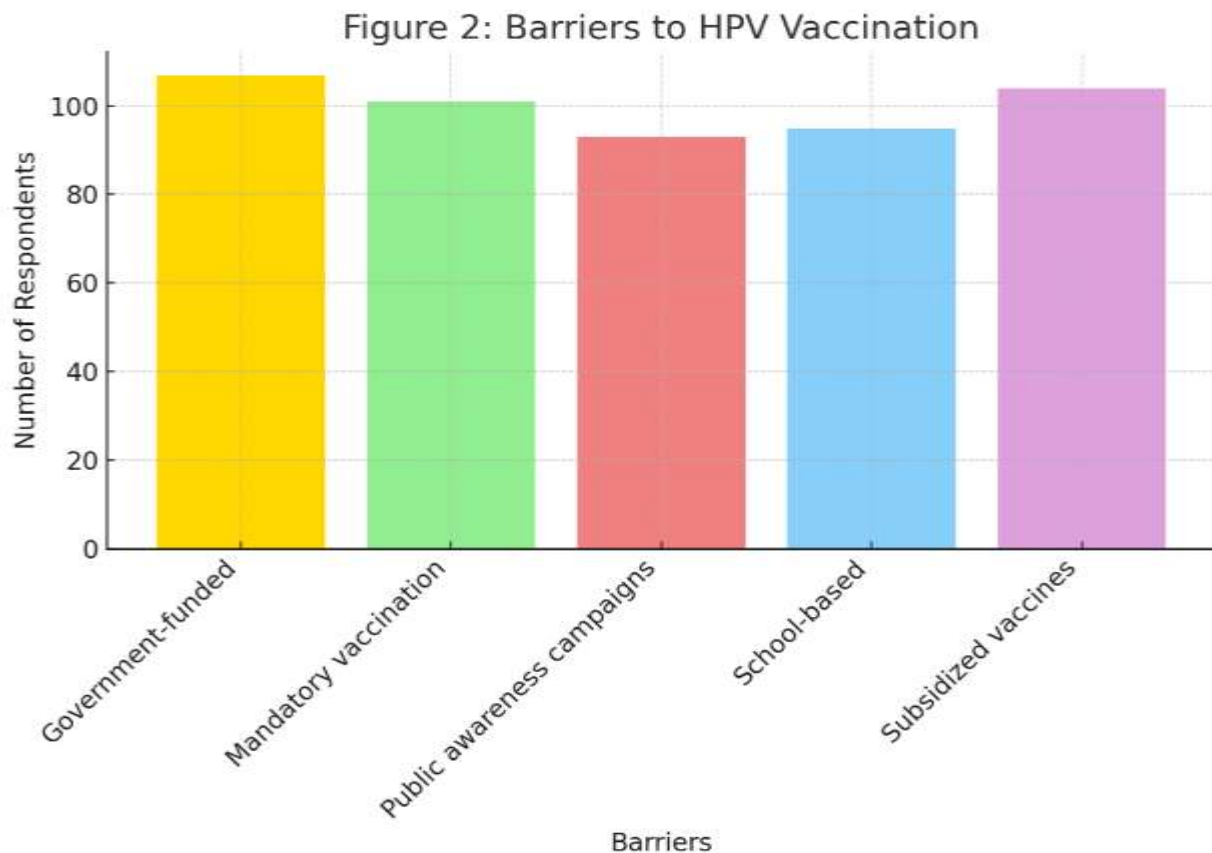
3. Practices Related to HPV Vaccination

In terms of actual vaccination practices, 49% (n=245) of the students reported having received the HPV vaccine, while 51% (n=255) had not. Additionally, 35% (n=175) expressed plans to get vaccinated, while 33.2% (n=166) did not plan to receive the vaccine, and 31.8% (n=159) were unsure.

Despite the relatively low uptake of the vaccine, 55.2% (n=276) of students had participated in HPV awareness programs, and 52.6% (n=263) had discussed HPV vaccination with healthcare providers. However, 44.8% (n=224) of students had not been involved in any awareness programs, indicating a gap in educational outreach.

Table 3:- Vaccination Practices Among Medical Students.

Practice Parameters	Number	Percentage
Received HPV vaccine	245	49.0%
Plan to get vaccinated	175	35.0%
Participation in awareness programs	276	55.2%
Discussion with healthcare providers about HPV	263	52.6%

**Figure 2:-** Barriers to HPV Vaccination.

Cost and a lack of information were identified as major barriers to HPV vaccination. 19.6% (n=98) of students considered cost a significant barrier, while 52.4% (n=262) felt that the topic of HPV vaccination was not adequately integrated into the medical curriculum. Additionally, 33% (n=165) of students reported concerns about vaccine side effects, and 35% (n=175) believed there was insufficient public awareness regarding HPV vaccination.

Conclusion:-

This study reveals significant gaps in the knowledge, attitude, and practices regarding HPV vaccination among medical students. While there is a moderate level of awareness about the existence of the HPV vaccine, a substantial portion of students held misconceptions about HPV transmission, the types of HPV most commonly associated with cervical cancer, and the vaccine's effectiveness. Attitudes towards the vaccine were mixed, with a significant proportion of students uncertain about its role in preventing HPV-related diseases and hesitant to support mandatory vaccination. Furthermore, the low vaccination rate among the students themselves, despite their role as future healthcare providers, is a concerning finding.

Barriers such as cost, insufficient public awareness, and the lack of integration of HPV vaccination education into the medical curriculum were identified as key factors hindering vaccination uptake. This highlights the need for targeted educational interventions to improve medical students' understanding of HPV and the benefits of vaccination. Incorporating HPV vaccination education into the medical curriculum, promoting public health

campaigns, and addressing concerns about vaccine safety and cost could improve both vaccination rates and advocacy among future healthcare professionals.

Ultimately, addressing these gaps is crucial in ensuring that medical students are well-equipped to promote HPV vaccination and contribute to reducing the burden of HPV-related diseases, including cervical cancer, in the wider population.

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