Original Article
DOI: https://doi.org/10.70749/ijbr.v3i1.523

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Assessment of Knowledge Regarding HPV Vaccination among Medical Students

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ARTICLE INFO

Keywords

HPV Vaccination, Medical Students, Knowledge Assessment, Vaccine Safety, Public Health, Pakistan.

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Declaration

Author's Contributions: All authors equally contributed to the study and approved the final manuscript.
Conflict of Interest: No conflict of interest.
Funding: No funding received by the authors.

Article History

Received: 26-10-2024
Revised: 21-12-2024
Accepted: 08-01-2025

ABSTRACT

Background: The human papillomavirus, or HPV, is a serious worldwide public health issue since it has been connected to illnesses including cervical cancer. Although there are effective HPV vaccines available, medical students' lack of knowledge may make it more difficult for them to encourage vaccination and lower the risks of HPV-related illnesses. **Objective:** This study aimed to assess the knowledge of HPV vaccination among medical students, identifying key areas of strength and weakness to inform targeted educational interventions. **Methodology:** A cross-sectional study was conducted from January to June 2023 at People's University of Medical and Health Sciences for Women (PUMHSW), Nawabshah, Pakistan, involving 420 medical students. A standardized, self-administered questionnaire was used to gather data, and SPSS was used for analysis. Descriptive statistics and chi-square tests were used to look at relationships between knowledge levels and demographic characteristics. **Results:** The survey found that although most people (90%) were aware of HPV's role in cancer and the advantages of vaccination (82.38%), fewer people (80.95%) were aware of the safety of vaccines. Age, academic year, and knowledge levels were shown to be significantly correlated; and older students (88.89%, $p = 0.01$) showed better knowledge. Compared to students in higher academic years, those in lower academic years, especially those in their first year (93.33%, $p = 0.01$), exhibited noticeably lower knowledge levels. **Conclusion:** While medical students possess strong awareness of HPV and vaccination benefits, gaps in knowledge regarding vaccine safety persist. Addressing these gaps through targeted educational interventions is essential to enhance HPV vaccination advocacy and public health outcomes.

INTRODUCTION

Human papillomavirus (HPV) is a widespread sexually transmitted infection globally, with over 100 known types, of which several are linked to serious health issues, including cervical cancer, anogenital warts, and other malignancies [1,2]. Due to restricted access to screening and immunization programs, low- and middle-income countries are disproportionately affected by cervical cancer, which alone causes around 311,000 deaths globally each year [3]. The incidence of disorders linked to HPV may be significantly decreased by HPV vaccination, which has become a very effective preventative strategy [4]. However, despite its shown safety and effectiveness, HPV vaccine uptake is still below ideal in many areas, often due to a lack of awareness, cultural obstacles, and false information [5].

As aspiring healthcare professionals, medical students are essential in advancing public health initiatives like HPV vaccination [6]. Their capacity to inform patients and promote vaccination is directly impacted by their knowledge of HPV and its prevention measures [7]. Nonetheless, current evidence indicates that medical students have substantial knowledge and awareness gaps, which raises questions regarding their readiness to make a meaningful contribution to immunization programs [8].

Research has shown that even among medical students, there are still misunderstandings about HPV transmission, vaccine safety, and recommended vaccination regimens [9]. In order to provide aspiring physicians, the abilities and self-assurance they need to overcome vaccine reluctance and enhance public health outcomes, it is imperative that these knowledge gaps be filled [10]. Thorough evaluations of medical students'

knowledge may provide important information on areas in need of focused educational interventions [11].

Despite the crucial role that medical students play in preventing HPV, little study has been done to systematically assess their level of knowledge, especially when considering certain institutions or geographical areas. These evaluations are crucial for creating specialized teaching plans that fill in the gaps and promote a better knowledge of the health hazards and preventative actions associated with HPV.

Research Objective

This study aimed to assess the level of knowledge regarding HPV vaccination among medical students, identifying key areas of strength and weakness to inform the development of targeted educational initiatives.

METHODOLOGY

Study Design and Setting

This cross-sectional study was conducted at People's University of Medical and Health Sciences for Women (PUMHSW), Nawabshah, Pakistan from January 2023 to June 2023.

Inclusion and Exclusion Criteria

The research included medical students from all academic years who were presently enrolled and gave their agreement to participate; students who were unavailable during the data collecting period, were on extended leave, or denied participation were not included.

Sample Size

Convenience sampling was used to calculate the sample size. A diverse representation within the institution was ensured by inviting 420 medical students from different academic years to participate. In order to get a sufficient number of participants for insightful analysis, this strategy took into consideration possible non-response.

Data Collection

A standardized, self-administered questionnaire was used to gather data. Sections on demographic data, general knowledge of HPV, awareness of HPV vaccine, and comprehension of its schedules and advantages were all included in the questionnaire, which was created based on the body of current research. To guarantee clarity and reliability, the questionnaire was pilot-tested on a small sample of medical students who were not included in the final study. All participants gave their informed permission prior to the questionnaire being distributed, and participation was entirely voluntary.

Statistical Analysis

SPSS version 26 was used for data entry and analysis. The data was summarized using descriptive statistics, such as means, standard deviations, frequencies, and percentages. Based on predetermined criteria, knowledge scores were divided into "adequate" and "inadequate" categories. Associations between knowledge levels and demographic characteristics were evaluated using chi-square tests, with a significance threshold of $p < 0.05$.

Ethical Approval

The study was reviewed and approved by the Ethical Review Committee. Written informed consent was obtained from all participants, and confidentiality of the data was strictly maintained throughout the study.

RESULTS

The demographic details of medical students are shown in Table 1. Participants were mostly in the age range of 21–23 (42.86%), with the 18–20 age range coming in second (35.71%). According to academic year, 35.71% of students were in their first year, 28.57% were in their second year, 21.43% were in their third year, and 14.29% were in their fourth year.

Table 1

Demographic Characteristics of Medical Students

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	18-20	150	35.71
	21-23	180	42.86
	Above 24	90	21.43
Academic Year	1st Year	150	35.71
	2nd Year	120	28.57
	3rd Year	90	21.43
	4th Year	60	14.29

Medical students' awareness and general understanding of HPV vaccination are highlighted in Figure 1. High awareness of HPV as a cause of cancer was noted (90.00%), followed by knowledge of the advantages of vaccination (82.38%) and the vaccination schedule (83.81%). However, 80.95% of respondents had acceptable awareness of vaccination safety, compared to 19.05% who had poor knowledge.

Figure 1

Awareness and General Knowledge of HPV Vaccination

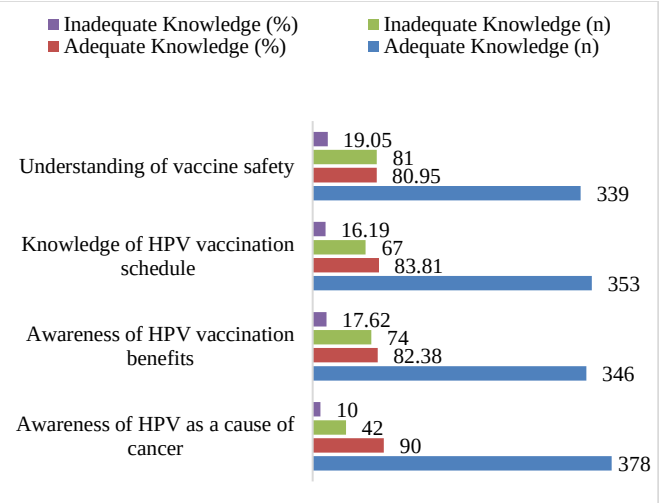

Table 2 uses chi-square tests to highlight the relationships between knowledge levels and demographic characteristics. It shows that knowledge levels among older students (those over 24) were substantially higher (88.89%) than those of younger age groups (p = 0.01). Second and third-year students demonstrated 100% appropriate knowledge (p = 0.01), indicating a substantial correlation between academic year and knowledge. Significantly lower knowledge levels (93.33% appropriate knowledge) were found in lower academic years, especially the first year (p = 0.01).

Table 2

Associations between Demographic Variables and Knowledge Levels using Chi Square Test

Demographic Variable		Adequate Knowledge (n)	Inadequate Knowledge (n)	Chi-square p-value
Age Group	18-20	90 (60.00%)	60 (40.00)	0.03
	21-23	126 (70.00%)	54 (30.00%)	0.05
	Above 24	80 (88.89%)	10 (11.11%)	0.01
Academic Year	1st Year	140 (93.33%)	10 (6.67%)	0.01
	2nd Year	120 (100%)	0 (%)	0.01
	3rd Year	90 (100%)	0 (%)	0.01
	4th Year	50 (83.33%)	10 (16.67%)	0.03

DISCUSSION

A cross-sectional survey was used in this research to gauge the knowledge of 420 medical students on HPV vaccination. Ninety percent of individuals recognized HPV's connection to cervical cancer, indicating a high level of knowledge on the virus's role in cancer. Likewise, 83.81% of students showed understanding of the vaccination schedule, and 82.38% of students knew the advantages of HPV vaccination. However, only 80.95% of students showed acceptable comprehension of vaccination safety, which was a rather low level of knowledge. These findings point to a solid body of information about HPV, especially its link to cancer prevention, but there is still a knowledge vacuum about vaccine safety, which is critical for increasing vaccination adoption and acceptability.

Comparatively speaking, our results are consistent with a number of other investigations that documented differing degrees of medical students' familiarity with HPV. For instance, our results are in line with an Indian research that revealed 87% of medical students knew of HPV's connection to cervical cancer [12]. However, that research also found that just 75% of respondents had sufficient information about the safety of HPV vaccinations, highlighting comparable knowledge gaps. Although our improved percentage of 80.95% shows some progress, there is still much space for improvement, particularly in vaccination safety communication.

Similar patterns of insufficient understanding of HPV vaccination have been seen in studies carried out in low- and middle-income nations, such as Pakistan. According to earlier research, Pakistani medical students showed a moderate degree of understanding, especially when it came to the effectiveness and safety of the HPV vaccination [13, 14]. By providing more detailed information, our results expand on these findings and highlight the fact that medical students who were older and in more academic years showed noticeably more expertise. In particular, students over 24 had a higher knowledge score (88.89%) than those in the 18–20 age range (60%). These variations imply that exposure to clinical training and more HPV vaccine instruction may eventually improve understanding.

Studies showed that women are typically more health literate and knowledgeable of vaccinations than men [15, 16]. Higher academic advancement was associated with greater knowledge and awareness about HPV vaccination in other locations, and this connection between academic year and knowledge level supports those results [17].

In conclusion, there are still a lot of unanswered questions, notably about vaccination safety, even if our work has shown some substantial advances in our understanding of HPV, particularly in the area of cancer prevention. These results highlight the significance of focused educational initiatives, especially in clearing up vaccine safety myths, to guarantee that medical students are prepared to promote HPV vaccination in their future careers.

Strengths and Limitations of the Study

One of the study's main advantages is the large and varied sample size of 420 medical students, which improves the results' generalizability. Systematic data collection was assured by the use of a structured, self-administered questionnaire, and a comprehensive analysis of knowledge discrepancies was made possible by the inclusion of many demographic characteristics. There are restrictions to take into account, however. Because the research relied on self-reported data, individuals could have inflated their expertise, which might lead to response bias. Furthermore, the convenience sampling approach may have introduced selection bias, which might have affected the sample's representativeness, and the cross-sectional design restricts the capacity to demonstrate causal correlations. More thorough insights into medical students' changing understanding of HPV vaccination might be possible with future studies that use longitudinal designs and bigger, more randomized populations.

CONCLUSION

This research offers important new information on medical students' HPV vaccination knowledge. The findings show that while HPV is widely recognized as a carcinogen, there are still significant knowledge gaps, especially with regard to vaccination safety. Knowledge levels were shown to be influenced by demographic parameters such age, and academic year, with older students and those in higher academic years exhibiting more awareness. These results highlight the need for focused educational initiatives, particularly to dispel myths about vaccine safety and provide medical students the tools they need to advocate for HPV vaccination in their future careers.

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