SHORT COMMUNICATION

A Cross-Sectional Study on Knowledge, Attitudes, and Acceptability of HPV Vaccination Among Final Year Medical Students in Rawalpindi, Pakistan

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SUMMARY

Objective: To assess the knowledge, attitudes, sources of information, preferred vaccination venues, and perceived barriers regarding human papillomavirus (HPV) vaccination among final-year medical students in Pakistan, and to evaluate the association between knowledge and attitude.

Study Design: Cross-sectional descriptive study.

Place and Duration of Study: The study was conducted at the Department of Obstetrics and Gynaecology, Fauji Foundation Hospital, Rawalpindi, Pakistan, from 1st August 2025 to 30th September 2025.

Methods: A structured questionnaire assessed demographics, HPV knowledge (eligibility, recommended age, dosing schedule), attitudes, information sources, preferred vaccination venues, and perceived barriers. Descriptive statistics were calculated, and analysis was performed to assess the association between knowledge and attitude ($\alpha = 0.05$).

Results: Fifty students from Fauji Foundation Hospital participated (mean age 23.7 ± 1.06 years; majority female and urban). Knowledge was predominantly moderate, with gaps in identifying the recommended ages for vaccination (9–14 years), the dosing schedule, and the need to vaccinate both males and females. Attitudes were largely positive: most participants supported HPV vaccination for cervical cancer prevention, endorsed inclusion in national programs, and expressed a willingness to recommend vaccination in future clinical practice. Workshops, textbooks, and formal teaching sessions were the most common and hospitals, universities, and schools were the preferred vaccination venues. Reported barriers included limited awareness, cultural concerns, misinformation, mistrust, and financial constraints. The association between knowledge and attitude was weak and not statistically significant ($r = 0.154$, $P = 0.331$).

Conclusion: Final-year medical students demonstrated positive attitudes toward HPV vaccination but had notable knowledge gaps and reported sociocultural and access-related barriers. Integrating structured HPV education into medical curricula, strengthening provider communication skills, and enhancing access through national immunization pathways can improve future vaccine advocacy and uptake in Pakistan.

Keywords: *Attitude, Medical Students, Pakistan, Papillomavirus Vaccines, Uterine Cervical Neoplasms, Vaccination.*

How to cite this: *Shukr UI, Badar F, Haroon M, Awan AS. A Cross-Sectional Study on Knowledge, Attitudes, and Acceptability of HPV Vaccination Among Final Year Medical Students in Rawalpindi, Pakistan. Life and Science. 2026; 7(1): 133-138. doi: http://doi.org/10.37185/LnS.1.1.1035*

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Received: Oct 04, 2025; Revised: Dec 15, 2025
Accepted: Dec 22, 2025

Introduction

Cervical cancer is one of the most preventable yet deadly cancers affecting women globally. Despite the availability of effective screening tools and prophylactic vaccines against human papillomavirus (HPV)—the primary cause of cervical cancer—uptake remains suboptimal in many countries, especially in low- and middle-income regions. As a result, global efforts have prioritized

HPV vaccination as a critical strategy to reduce cervical cancer incidence.

Cervical cancer remains a major public health burden worldwide, particularly in low- and middle-income countries where limited access to screening and preventive services contributes to high morbidity and mortality.[1,2] Nearly all cervical cancer cases are attributable to persistent human papillomavirus (HPV) infection, the principal etiological agent.[2,3] Prophylactic HPV vaccination has demonstrated substantial effectiveness in reducing HPV infection, premalignant lesions, and cervical cancer in countries where national vaccination programs have been implemented.[4-7]

Despite global evidence, HPV vaccination awareness and uptake remain low in Pakistan. The WHO Global Strategy to accelerate the elimination of cervical cancer as a public health problem underscores the importance of achieving high HPV vaccination coverage.[8] Key barriers include gaps in knowledge, cultural sensitivities, and limited access.[9-11] With the introduction of HPV vaccination into the Expanded Programme on Immunization (EPI), the role of future healthcare providers becomes critical. Understanding the knowledge, attitudes, and perceived barriers among final-year medical students is essential for improving vaccine advocacy and uptake in the country.

Methods

This cross-sectional descriptive study was conducted at the Department of Obstetrics and Gynaecology, Fauji Foundation Hospital, Rawalpindi, Pakistan, from 1st August 2025 to 30th September 2025. The study was conducted in accordance with the Declaration of Helsinki, and ethical approval was obtained from the Institutional Review Board of Fauji Foundation Hospital, Rawalpindi vide letter reference no: 994/RC/FFH/RWP, dated: 25th July 2025. Written informed consent was obtained from all participants. No identifiable personal information was collected, ensuring confidentiality.

The study population comprised of final-year MBBS students who attended clinical rotations at the Fauji Foundation hospital during the study period. All students present on the days of data collection were invited to participate.

Final-year medical students of both genders who were present during clinical postings at the study site and provided informed consent were included in the study. Students who declined to participate or returned incomplete questionnaires were excluded.

A consecutive sampling technique was used. Students who met the inclusion criteria and consented to participate were enrolled until the sample size was completed.

Data were collected using a structured, self-administered questionnaire developed after a review of the existing literature on HPV vaccination knowledge and attitudes. The questionnaire comprised five sections: demographics; HPV knowledge (including eligibility, recommended age, and dosing schedule); attitudes toward HPV vaccination; sources of information and preferred vaccination venues; and perceived barriers.

The questionnaire was pilot tested on a small group of students to ensure clarity and reliability. Necessary modifications were made prior to final administration.

Participants completed the questionnaire anonymously during their rotation hours. The principal investigator supervised distribution and ensured completeness before inclusion in the dataset.

Data was entered into SPSS version 26 for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated for demographic variables, knowledge, attitudes, and barriers. association between knowledge and attitude scores was explored, with $P < 0.05$ considered statistically significant.

Results

A total of 50 final-year medical students participated in the study. Most respondents were female, single, and from urban settings, reflecting a relatively homogenous study population. The demographic profile is shown in Table 1.

Overall, knowledge of HPV and its vaccination was moderate. While the majority were aware of the relationship between HPV and cervical cancer, fewer demonstrated an accurate understanding of the recommended age for vaccination, ideal dosing schedules, and eligibility for both sexes. These knowledge patterns are summarized in Table 2.

Overall attitudes toward HPV vaccination were

Table 1: Demographic characteristics of final-year medical students (N = 50)

Variable	Categories	N (%)
Age (years)	Mean ± SD	23.7 ± 1.06
Gender	Male / Female	9 (18.0) / 41 (82.0)
Marital Status	Single / Married / Engaged	46 (92.0) / 1 (2.0) / 3 (6.0)
Residency	Urban / Rural	48 (96.0) / 2 (4.0)
Ethnicity	Punjabi / Urdu / Saraiki / Kashmiri	38 / 9 / 2 / 1

Table 2: Knowledge regarding HPV and vaccination (N = 50)

Knowledge Item	Correct Response (%)
HPV stands for Human Papillomavirus	100.0
HPV infection is associated with multiple conditions	62.0
Vaccine should be given to both males & females	34.0
Correct vaccination age (9–14 years)	48.0
Correct number of doses	14.0 (1 dose), 32.0 (2 doses), 12.0 (3 doses)
Vaccine effective in preventing cervical cancer	72.0
Vaccine considered safe	92.0
Cervical cancer occurs in both sexes	24.0
Overall Knowledge Score	Low 14.0%; Moderate 60.0%; High 26.0%

Table 3: Attitudes toward HPV vaccination (N = 50)

Attitude Item	Strongly Agree/Agree (%)
HPV vaccination is important for prevention	86.0
Recommend vaccination to patients	86.0
Should be included in the national program	86.0
Confident discussing HPV vaccination	76.0
Need for awareness campaigns	88.0
Comfortable recommendation to both sexes	50.0
Positive influence of social media	66.0
Social media contributes to misconceptions	46.0
Positive Attitude Score (>75%)	68.0

Table 4: Sources of information and preferred venues for HPV vaccination (N = 50)

Source of Information	N (%)	Preferred Venue	Strongly Agree/Agree (%)
Workshops/seminars	66.0	Hospitals/Clinics	96.0
Medical textbooks	56.0	Schools	90.0
Teachers/Clinicians	52.0	Universities/Workplaces	96.0
Internet resources	46.0	Community centers	86.0
Family/Friends	30.0	Mobile units	86.0
Media (TV/Radio)	18.0	-	-

Table 5: Barriers and sssociations (N = 50)

Barrier/Association	Finding
Major Barriers	Lack of awareness (98.0%), cultural/religious beliefs (80.0%), distrust in the healthcare system (83.0%), cost/access (74.0%)
Attitude vs Knowledge	No significant association ($P > 0.05$)
Knowledge vs Barriers	No significant association ($P > 0.05$)
Knowledge vs Attitude	Weak positive (r = 0.154, $P = 0.331$)

predominantly positive. Most participants supported vaccine uptake, acknowledged its preventive importance, and agreed on the need for awareness initiatives and inclusion in national immunization services. However, fewer respondents felt confident discussing or recommending the vaccine universally as is depicted in, as shown in Table 3.

Workshops, textbooks, and teachers were reported as key information sources, while hospitals, universities, and schools emerged as the most acceptable venues for vaccine delivery. These preferences are detailed in Table 4.

Multiple barriers influenced HPV vaccination; the most frequently reported barriers included lack of awareness (98.0%), distrust in the healthcare system (83.0%), cultural or religious concerns (80.0%), and issues related to cost and access (74.0%). The analysis revealed no significant association between knowledge and attitudes, although a weak positive trend suggested that improved knowledge may still support better advocacy. Barrier patterns and findings are shown in Table 5.

Discussion

The findings of this study indicate that final-year medical students had predominantly moderate knowledge of HPV vaccination but overwhelmingly positive attitudes toward its importance in cervical cancer prevention. Similar patterns have been reported among medical and healthcare students in Pakistan and comparable settings, where basic awareness is relatively common but detailed understanding of recommended vaccination age, dosing schedules, and eligibility remains inconsistent.[9,10] Educational interventions have been shown to improve HPV-related knowledge and willingness to recommend vaccination, highlighting the value of structured teaching and targeted training.[12] Evidence from South Asian contexts also shows that sociocultural concerns and access-related issues strongly influence perceptions of vaccines and their uptake.[13] Studies from other low-resource settings report comparable knowledge gaps despite favorable attitudes, supporting the need for curriculum-based reinforcement before graduation.[14] Trust and cultural concerns further shape HPV vaccination decisions and should be addressed through clear counseling and credible information sources.[15] Countries with established national vaccination programs have documented significant reductions in HPV prevalence, genital warts, and high-grade cervical lesions following vaccine introduction, reinforcing the importance of strong awareness and advocacy within the healthcare workforce.[4-7]

Global success stories, such as Australia, highlight the transformative impact of universal vaccination and sustained public health efforts, with projections suggesting cervical cancer may be eliminated as a public health problem within the coming decades.[7,8] Despite these advances, Pakistan continues to face substantial challenges. Limited awareness, cultural sensitivities, concerns regarding vaccine safety, financial constraints, and widespread misinformation remain key barriers, similar to patterns observed across South Asian populations.[9,10-11,13]

The WHO's global strategy emphasizes achieving high HPV vaccination coverage and strengthening screening and treatment to eliminate cervical cancer.^8 Improving communication skills and integrating HPV prevention education into medical curricula and clinical training can influence future vaccination practices.[12] The weak association between knowledge and attitude observed in this study mirrors findings from other low-resource

settings.[14,15] Pakistan remains far below the recommended vaccination thresholds.[16] Strengthening the role of healthcare providers is essential, as provider recommendations and communication are key determinants of HPV vaccine uptake.[17]

Persistent barriers such as cultural misconceptions, limited access, and financial limitations—widely recognized contributors to vaccine hesitancy—continue to impede uptake both locally and globally.[18–20] Targeted public health interventions, comprehensive awareness strategies, and curriculum-based training are therefore essential to optimizing HPV vaccine acceptance.

This was a single-center study with a relatively small sample size, which may limit generalizability. Self-reported responses also carry the possibility of response bias.

Integration of structured HPV education into undergraduate curricula, coupled with awareness campaigns and improved counseling training, may enhance future vaccine advocacy. Addressing cultural concerns, improving accessibility, and strengthening public trust are essential for improving vaccination rates in Pakistan.

Conclusion

Final-year medical students demonstrated favorable attitudes toward HPV vaccination; however, important knowledge gaps remain. Strengthening undergraduate medical curricula, improving awareness strategies, and addressing sociocultural and healthcare system barriers are necessary to enhance vaccination advocacy and uptake. Equipping future clinicians with accurate knowledge and confidence in HPV counseling will be critical in supporting national efforts to prevent cervical cancer in Pakistan.

Acknowledgement: None

Conflict of Interest: The authors declare no conflict of interest

Grant Support and Financial Disclosure: None

REFERENCES

1. World Health Organization. Human papillomavirus (HPV) and cervical cancer — Key facts. WHO; 2023. Availbe at: https://www.who.int/news-room/fact-sheets/detail/human-papilloma-virus-and-cancer
2. Wei F, Georges D, Man I, Baussano I, Clifford GM. Causal attribution of human papillomavirus genotypes to invasive cervical cancer worldwide: a systematic analysis of the global literature. Lancet. 2024; 404: 435-44. doi: 10.1016/S0140-6736(24)01097-3
3. Wang W, Kothari S, Skufca J, Giuliano AR, Sundström K, Nygård M, et al. Real-world impact and effectiveness of the quadrivalent HPV vaccine: an updated systematic literature review. Expert Review of Vaccines. 2022; 21: 1799-817. doi: 10.1080/14760584.2022.2129615
4. Bruni L, Saura-Lázaro A, Montoliu A, Brotons M, Alemany L, Diallo MS, et al. HPV vaccination introduction worldwide and WHO-UNICEF coverage estimates 2010–2019. Preventive Medicine. 2021; 144: 106399. doi: 10.1016/j.ypmed.2020.106399
5. Chen YC, Chen YY, Su SY, Jhuang JR, Chiang CJ, Yang YW, et al. Projected time for the elimination of cervical cancer under various intervention scenarios: age-period-cohort macrosimulation study. JMIR Public Health and Surveillance. 2024; 10: e46360. doi: 10.2196/46360
6. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. World health organization. 2020. Available at: https://www.who.int/publications/i/item/9789240014107
7. Shamsi U, Zahid F, Jabbar AB, Musharraf MD, Gauhar F, Akbar I, et al. Human papillomavirus vaccine awareness and acceptability for primary prevention of cervical Cancer in Pakistan: a cross-sectional study. Asian Pacific Journal of Cancer Prevention. 2024; 25: 813-20. doi: 10.31557/APJCP.2024.25.3.813
8. Chauhan S, Tiwari SK, Dubey V, Tripathi P, Pandey P, Singh A, et al. Knowledge, attitude, and reasons for non-uptake of human papillomavirus vaccination among nursing students. BMC Medical Education. 2025; 23: 35. doi: 10.1186/s12916-025-03874-w.
9. Hirani S, Khan S, Akram S, Virji SN, Shaikh PA, Naeem E, et al. Knowledge, awareness, and practices of cervical cancer, its risk factors, screening, and prevention among women in Karachi, Pakistan. European Journal of Cancer Prevention. 2021; 30: 97-102. doi: 10.1097/CEJ.0000000000000590
10. Rafeie L, Vizeshfar F, Nick N. The effect of education based on planned behavior theory on women's knowledge and attitudes about human papillomavirus. Scientific Reports. 2024; 14: 18581. doi: 10.1038/s41598-024-69340-4
11. Rajkhowa P, Patil DS, Dsouza SM, Narayanan P, Brand H. Evidence on factors influencing HPV vaccine implementation in South Asia: a scoping review. Glob Public Health. 2023; 18: 2288269. doi: 10.1080/17441692.2023.2288269
12. Taha H, Alhawamdeh T, Alkhaldi SM, Ali Albsoul R, Al-Ani A, Awamleh S, et al. Knowledge and attitudes of medical students regarding human papilloma virus infection and vaccine: cross-sectional study from Jordan. Frontiers in Cellular and Infection Microbiology. 2025; 15: 1657090. doi: 10.3389/fcimb.2025.1657090
13. Kisa S, Kisa A. Religious beliefs and practices toward HPV vaccine acceptance in Islamic countries: A scoping review. PLoS One. 2024; 19: e0309597. doi: 10.1371/journal.pone.0309597
14. Oh NL, Biddell CB, Rhodes BE, Brewer NT. Provider

communication and HPV vaccine uptake: A meta-analysis and systematic review. Preventive Medicine. 2021; 148: 106554. doi: 10.1016/j.ypmed.2021.106554
15. Constable C, Ferguson K, Nicholson J, Quinn GP. Clinician communication strategies associated with increased uptake of the human papillomavirus (HPV) vaccine: a systematic review. CA: A Cancer Journal for Clinicians. 2022; 72: 561-9. doi: 10.3322/caac.21753
16. Kyei GK, Kyei EF, Ansong R. HPV Vaccine Hesitancy and Uptake: A Conceptual Analysis Using Rodgers' Evolutionary Approach. Journal of Advanced Nursing. 2025; 81: 2368-81. doi: 10.1111/jan.16653
17. MacDonald NE. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2015; 33: 4161-4. doi: 10.1016/j.vaccine.2015.04.036
18. Murewanhema G, Moyo E, Dzobo M, Mandishora-Dube RS, Dzinamarira T. Human papilloma virus vaccination in the resource-limited settings of sub-Saharan Africa: Challenges and recommendations. Vaccine X. 2024; 20: 100549. doi: 10.1016/j.jvacx.2024.100549
19. Ali RF, Arif Siddiqi D, Mirza A, Naz N, Abdullah S, Kembhavi G, et al. Adolescent girls' recommendations for the design of a human papillomavirus vaccination program in Sindh, Pakistan: a qualitative study. Human Vaccines & Immunotherapeutics. 2022; 18: 2045856. doi: 10.1080/21645515.2022.2045856
20. Gallagher KE, LaMontagne DS, Watson-Jones D. Status of HPV vaccine introduction and barriers to country uptake. Vaccine. 2018; 36: 4761-7. doi: 10.1016/j.vaccine.2018.02.003

Author Contributions

UIK: Manuscript writing for methodology design and investigation

FB: Data acquisition, curation, and statistical analysis,

MH: Validation of data, interpretation, and write-up of results, writing the original draft, proofreading, and approval for final submission

ASA: Conception and design of the work**,** revising, editing, and supervising for intellectual content