

Assessment of HPV Vaccine Knowledge Levels Among Medical Faculty Students: A Comprehensive Examination in the Turkish Context

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ABSTRACT

Objective: The primary objective of this study was to measure medical students' knowledge, attitudes, and future professional intentions regarding HPV and its vaccines. This study aims to identify the factors that impact these variables within Turkey's distinctive sociocultural and healthcare landscapes. The insights derived from data analysis can be employed to guide focused educational interventions, aiming to enhance HPV vaccination rates and mitigate HPV-related health outcomes in Turkey.

Material and Methods: Carried out between November and December 2022, this study employed a descriptive and comparative research design to evaluate HPV-related knowledge, attitudes, and intentions among 687 medical students enrolled in the Medical Faculty of Afyonkarahisar Health Sciences University. A comprehensive 20-question survey was administered, covering demographic details, HPV awareness, and attitudes towards vaccination, followed by statistical analysis.

Results: The study population exhibited a mean age of 20.6 years and was predominantly female (60.1%). Overall, 91.6% of the participants were aware of HPV, primarily through their medical education (52.1%) and social media (42.3%). However, only 3.5% of the patients were vaccinated against HPV. Factors influencing vaccine uptake included having close contacts diagnosed with HPV or cervical cancer ($p=0.001$), gender ($p=0.01$ for females, $p=0.02$ for males), and prior HPV awareness ($p=0.03$). Significant misconceptions existed, notably regarding HPV's association with specific cancers and the vaccine's inclusion in the regular schedule.

Conclusions: According to our study, medical students' attitudes and knowledge about HPV and HPV vaccination are critically important for future healthcare providers and policymakers. HPV-related cancers beyond cervical cancer are poorly understood, and vaccine counselling training is inadequate. Students who had been in close contact with HPV or cervical cancer exhibited a significantly higher likelihood of receiving the vaccine. It is crucial to formulate focused educational strategies that enhance HPV vaccine adherence and provide future medical professionals with the skills to educate patients effectively.

Keywords: HPV, Medical Students, Human Papillomavirus Education, Immunization Rates, Future Healthcare Providers, Student Perceptions, Cervical Cancer Prevention.

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INTRODUCTION

Human papillomavirus (HPV) is a prevalent global, sexually transmitted infection. Its impact is far-reaching, with 13 high-risk HPV types firmly implicated in various cancers affecting diverse anatomical sites, including the cervix, vagina, vulva, anus, penis, and oropharynx (1). This pervasive influence is evident in the United States (USA), where a staggering 79 million individuals harbor HPV infections, with approximately 14 million new cases emerging annually, particularly among those in their late teens and early twenties. This epidemiological urgency translates into over 33,000 HPV-associated cancers annually in the USA (2).

To mitigate the burgeoning consequences of HPV infections and the subsequent development of related diseases, the Advisory Committee on Immunization Practices (ACIP) has unequivocally advocated the routine vaccination of both boys and girls, commencing at ages 11–12 years (1, 3). This preventive strategy is supported by the notable efficacy of the HPV vaccine, approaching 100% protection against cancer-associated HPV strains and sustained protection (3, 4).

Nevertheless, the observed landscape of HPV vaccination has not yet reached the desired level of coverage. As of 2017, HPV vaccination rates among US adolescents aged 13–17 years were 65.5%, and only 48.6% completed the recommended vaccination series (5). This considerable disparity from the Healthy People 2020 objective of an 80% completion rate underscores the significant implementation gap. Moreover, these rates disclose marked discrepancies based on race, ethnicity, socioeconomic status, and geographical location, with urban-rural disparities further exacerbating this scenario (5, 6). The Turkish Gynecological Oncology Association and the Turkish Pediatric Association formally recommend immunization against HPV. Both HPV vaccines have been available in Turkey since 2007. HPV vaccines are accessible in Turkey; nonetheless, they are not included in the routine national immunization programs. Therefore, HPV vaccination rates are estimated to be minimal in Turkey (7). Challenges hindering the achievement of optimal HPV vaccination rates are multifaceted. Barriers include limited awareness of HPV and the vaccine, financial constraints, constrained healthcare access, inadequate provider recommendations, concerns about vaccine safety, and stigma encircling discussions of sexual activity (8). Notably, effective recommendations from healthcare providers play a pivotal role in overcoming these barriers (9, 10).

Thus, the onus lies in nurturing a generation of healthcare providers equipped with comprehensive knowledge of HPV, its associated diseases, the significance of vaccination, and the effective communication of vaccine recommendations. While extensive international research has explored HPV and HPV vaccine knowledge, acceptance, and barriers among medical students, Turkish medical students' perspectives remain relatively unexplored. Several international studies conducted in diverse regions, such as China, India, Scotland, and Romania, have underscored the pressing need to enhance education and awareness among medical students, given their role as disseminators of accurate information upon transitioning to clinical practice (9-12). Unfortunately, the depth and prevalence of such training in US medical education remains unclear.

An array of studies investigating HPV vaccine knowledge and attitudes within US medical student cohorts have emerged, underscoring the need for targeted interventions (2, 13). A survey presented a scenario wherein a majority expressed the intention to recommend the HPV vaccine; however, only 40% felt sufficiently informed about it or capable of providing counsel to patients regarding it (14). Notably, students who had received HPV vaccination displayed better knowledge and a more favorable attitude towards it. A parallel exploration of the influence of students' personal HPV vaccination status on their inclination to recommend the vaccine revealed that vaccinated students

were more likely to advocate vaccination and engage in discussions irrespective of the clinical context. This suggests that personal vaccination experience may influence future professional conduct (13).

Given these studies and the gap in the existing literature, the urgency to investigate medical students' knowledge and attitudes towards HPV vaccination is evident. This exploration is essential to unravel the intricate web of factors influencing medical students' perceptions and to identify strategic points for intervention and education.

Consequently, the present study sought to meticulously assess HPV knowledge levels, HPV vaccination knowledge, attitudes, vaccination behaviors, and anticipated professional practices of students enrolled at the Afyonkarahisar Health Sciences University Medical Faculty. By delving deeply into medical students' comprehension of HPV within the unique Turkish context, this research not only contributes to the broader discourse on HPV vaccination but also provides a localized understanding essential for enhancing HPV immunization strategies in Turkey.

MATERIAL and METHODS

Study Group: The study was methodically organized as a component of the third-year project application course at Afyonkarahisar Health Sciences University Medical Faculty and was carried out from November 15 to December 31, 2022. A comprehensive face-to-face survey, consisting of 20 questions pertaining to HPV and HPV vaccination, was administered to 687 healthy medical students at the Afyonkarahisar University Faculty of Medicine. Written informed consent was obtained from all participants prior to their engagement in the survey, affirming their adherence to ethical guidelines. The duration of participation for each respondent was systematically measured, with a median time of 20 min, reflecting the study's commitment to both thoroughness and efficiency. The survey's focused design and rigorous implementation have contributed to a nuanced assessment of knowledge levels regarding HPV within this specific academic context.

Study Design: A descriptive and comparative research design was employed to explore the perceptions, knowledge, and attitudes of medical students towards HPV and the HPV vaccine. The survey encompassed various facets, including demographic information, HPV knowledge, and attitudes towards HPV vaccination. Participants were probed for their understanding of HPV, cervical cancer, HPV vaccines, reasons for willingness or unwillingness to be vaccinated, and factors influencing HPV vaccine promotion.

The section examining awareness of HPV infection consisted of 16 closed questions, offering response options of "yes," "no," or "not clear." These questions were designed to gauge participants' familiarity with HPV. Frequencies and percentages of accurate responses were tabulated for analysis.

Survey Data: The survey questionnaire comprised 20 main questions and was meticulously structured to evaluate participants' awareness, knowledge, and attitudes concerning HPV diseases, their association with cervical cancer, and the HPV vaccine.

The survey encompassed the following domains.

Demographic Items: Participants' age, gender, academic year, marital status, presence of children, nationality, and children's age were recorded.

-HPV Knowledge: Participants' familiarity with HPV, sources of information about HPV, awareness of modes of transmission and preventive measures, and personal experience with HPV infections in their close circle.

-Attitudes and Behavior: Participants' views on HPV vaccination, reasons for both receiving and not receiving the HPV vaccine, and factors influencing their decisions.

-Source of Knowledge: Participants were asked to specify the sources from which they acquired information on HPV, cervical cancer, and the HPV vaccine.

Statistical Analysis: The data collected from the 687 completed surveys were analyzed using SPSS version 15.0. Descriptive statistics, including frequencies, were used to evaluate the demographic data, HPV knowledge, and vaccine acceptance among participants. T-tests were conducted to discern any significant differences among the demographic questions, HPV knowledge, and perceptions of HPV vaccination. A significance threshold of $p < 0.05$ was applied to all statistical tests.

Ethical Issues: The research design and methodology were subjected to rigorous examination and subsequently received approval from the Afyonkarahisar Health Sciences University Clinical Research Ethics Committee (date:04.11.2022, Decision No552). This compliance ensures that the study's implementation aligns with the necessary ethical standards, demonstrating a diligent commitment to the participants' well-being and the integrity of scientific investigation.

RESULTS

General Demographics of the Participants

The study encompassed 687 medical faculty students at Afyonkarahisar University Faculty of Medicine, comprising a diverse representation across different educational years, ranging from the first to the sixth. Within this sample, there was a predominance of females, comprising 413 women (60.1%) and 274 men (39.9%). The age distribution presented a mean age of 20.6 years, range: 17–36 years).

In terms of marital status, the vast majority were unmarried, accounting for 673 participants (98.0%), whereas a small fraction, 14 participants (2.0%), reported being married. Within the sample, only three participants had children, representing a minimal percentage (0.43%) of the total. The study sample predominantly comprised Turkish citizens, with 676 participants (98.4%), while 11 participants (1.6%) were of foreign nationality. Third-year students were the most represented in the study according to the distribution of participants across academic years.

Awareness and Sources of Knowledge About HPV

Of the 687 healthy participants in the study, 629 (91.6%) had previously heard of HPV. The sources of information were diverse, with the majority gaining knowledge during their medical faculty education (328 participants, 52.1%). Social media emerged as the second most prevalent source of

information, cited by 266 participants (42.3%), followed by friends and acquaintances (119 respondents, 18.9%). Television and family members were comparatively fewer sources of information, as reported by 67 participants (10.6%) and 50 participants (7.9%), respectively.

Knowledge Levels Regarding HPV Infection

When assessing the specific knowledge levels related to HPV infection, the survey revealed that 101 participants (14.7%) were cognizant of the modes of transmission and preventive measures for HPV. Moreover, 30 participants (4.4%) reported having a family member or close acquaintance diagnosed with HPV infection, whereas 26 participants (3.8%) identified having someone in their close circle diagnosed with cervical cancer. Additionally, 116 participants (16.9%) were aware of someone in their family or close surroundings who had received HPV vaccine.

HPV Vaccination Practices and Influences

Regarding vaccination practices Among the 687 healthy participants, only 24 (3.5%; 15 women, 9 men) received the HPV vaccine. The motivations behind their decisions to be vaccinated were analyzed, revealing various influences. Four participants (16.7%) were vaccinated due to family recommendations, two participants (8.3%) following the advice of family members studying in the medical faculty, six participants (25%) at the suggestion of their regular doctor, and three participants (12.5%) due to fear of HPV infection and its consequences.

Perceptions, Knowledge, and Attitudes Toward HPV and HPV Vaccination

The assessment of HPV vaccination knowledge was extended to query participants about the target demographics of the vaccine. This aspect of the questionnaire aimed to gauge medical students' understanding of who should receive the HPV vaccine, with responses broken down by gender. **Table 1** illustrates the detailed distribution of the answers.

In order to investigate the factors contributing to the reluctance or hesitancy towards receiving the HPV vaccine, a targeted inquiry was conducted among 678 respondents. Participants were asked, "Why do you choose not to receive the HPV vaccine?" The distribution of the responses is outlined in **Table 2**.

Factors that influence medical students' perceptions of the HPV vaccine. Notably, economic considerations and a lack of awareness about the vaccine emerged as significant barriers, accounting for over 70% of the responses.

The survey revealed diverse understandings of HPV: while 87.6% of participants recognized HPV as a sexually transmitted virus, their understanding diverged in areas such as HPV's association with cancers and prevention methods. 31.8% affirmed that HPV can cause penile cancer, 72.5% acknowledged its role in cervical cancer, and 46.9% and 72.5% recognized its potential to cause anorectal cancer and genital warts, respectively. In terms of protection, 70.6% believed in vaccination, and 29.5% used condoms. However, substantial uncertainties and misconceptions existed, with respondents expressing doubt or disagreement about HPV's link between HPV and specific cancers (48.0% for penile, 26.9% for cervical) and prevention methods (24.4% for

unsure about vaccination, 42.3% for condoms). The details of knowledge and misconceptions regarding Human Papillomavirus (HPV) infection among the participants are presented in **Table 3**.

The survey results revealed strong agreement among the participants that the HPV vaccine is necessary for cervical cancer risk reduction in women (75.1%) and that it should be administered to all adolescents (56.5%) and both sexes between the ages of 9-25 (65.8%). The vast majority (68.8%) disagreed with the statement that men did not need the vaccine. Additionally, respondents emphasized the importance of administering the vaccine before sexual activity began (67.5%) and to all sexually active individuals (68.3%).

Misconceptions and uncertainties were also evident, particularly regarding the vaccine's inclusion in the regular schedule (52.4% answered 'No') and cost (27.1% answered 'Not Sure').

The participants' awareness and attitudes towards HPV vaccination were assessed in various aspects, as summarized in **Table 4**.

This study demonstrated marked gender-based variations in both knowledge and attitudes toward HPV vaccination, with particularly significant findings in the realms of cervical cancer and gender-specific vaccination requirements.

The difference in knowledge of HPV as a common cause of cervical cancer was statistically significant between males and females ($p=0.002$), potentially reflecting a discrepancy in public health messaging targeting each sex (**Table 5**).

This study evaluated the association between the presence of close contacts diagnosed with HPV or cervical cancer and the willingness to receive the HPV vaccine. The results posited that individuals with relatives or friends diagnosed were more willing to be vaccinated (**Table 6**).

The average age of those who have received the vaccine is slightly higher at 21 years, compared to 20.5, for those who have not, and the difference is insignificant.

Women were slightly more willing to receive the vaccine than men. Fisher's Exact Test p -value of 0.01 and 0.02 suggests that gender is a significant factor.

Most people who received the vaccine had previously heard of HPV; a significant difference indicated that awareness may be associated with vaccination status ($p=0.03$).

Having close contact is a significant factor in deciding to be vaccinated. Among the 32 individuals with close contacts diagnosed, 12 received the vaccine, compared to 12 of the 655 individuals with no close contacts diagnosed ($p=0.001$).

Table 1: Distribution of Responses to the Question "Who should receive the HPV vaccine?" by Gender.

Target Demographic	Gender of Respondent	Count	% of Total
Answer: Male children only	Female	26	3.8%
	Male	14	2.0%
Answer: Female children only	Female	69	10.0%
	Male	52	7.6%
Answer: Both male and female children	Female	100	14.6%
	Male	49	7.1%
Answer: All individuals aged 9–25	Female	220	32.0%
	Male	123	17.9%
Answer: All adult individuals	Female	156	22.7%
	Male	103	15.0%

Table 2: Distribution of Responses to the Question "Why do you not want to receive the HPV vaccine?"

Response	N	%
Due to the cost of the vaccine	266	39.2%
Unaware of the vaccine's existence	232	34.2%
Being male and believing not to be in a risk group	95	14.0%
Not fearing HPV infection	59	8.7%
Fear of vaccination itself	26	3.8%
Lack of belief in the vaccine's effectiveness	8	1.2%

Table 3: Distribution of Responses to Questions about Knowledge Regarding HPV Infections

Statement	Yes	No	Not Sure
HPV is a sexually transmitted virus	604 (87.6%)	4 (0.6%)	79 (11.5%)
HPV can cause penile cancer	219 (31.8%)	138 (20.1%)	330 (48.0%)
HPV is one of the most common causes of cervical cancer	499 (72.5%)	3 (0.4%)	185 (26.9%)
HPV infection can lead to anorectal cancers	323 (46.9%)	34 (4.9%)	330 (48.0%)
HPV infection can lead to genital warts	499 (72.5%)	13 (1.9%)	175 (25.5%)
The most important way to protect against HPV infection is vaccination	486 (70.6%)	33 (4.8%)	168 (24.4%)
The most important way to protect against HPV infection is using condoms	203 (29.5%)	193 (28.1%)	291 (42.3%)

Table 4: Distribution of Responses on Attitudes and Knowledge Regarding HPV Vaccination

Statement	Yes	No	Not Sure
Cervical cancer risk reduction for women is necessary	75.1% (517)	5.1% (35)	19.6% (135)
Should be administered to all adolescents	56.5% (389)	7.6% (52)	35.8% (246)
Should be given to both genders, ages 9-25	65.8% (453)	4.8% (33)	29.2% (201)
There is no need to vaccinate men	4.5% (31)	68.8% (474)	26.4% (182)
Important to administer before sexual activity begins	67.5% (465)	3.6% (25)	28.6% (197)
Should be given to all sexually active individuals	68.3% (471)	5.8% (40)	25.6% (176)
Should be administered to adolescent girls	64.1% (442)	3.3% (23)	32.2% (222)
The vaccine is included in the regular vaccination schedule	7.8% (54)	52.4% (361)	39.5% (272)
The vaccine is available for a fee	71.3% (491)	1.3% (9)	27.1% (187)

Table 5. Knowledge and Attitudes about HPV Vaccine by Sex (N = 687)

Statement	Knowledge Items			Fisher's Exact Test p-value
	Total True Responses	Female	Male	
HPV is a sexually transmitted virus	604 (87.6%)	340 (89%)	264 (86%)	0.07
HPV can cause penile cancer	219 (31.8%)	101 (27%)	118 (38%)	0.09
HPV is one of the most common causes of cervical cancer	499 (72.5%)	350 (92%)	149 (49%)	0.002
HPV infection can lead to anorectal cancers	323 (46.9%)	181 (48%)	142 (46%)	0.18
HPV infection can lead to genital warts	499 (72.5%)	280 (74%)	219 (71%)	0.003
The most important way to protect against HPV infection is vaccination	486 (70.6%)	270 (71%)	216 (70%)	0.16
The most important way to protect against HPV infection is using condoms	203 (29.5%)	132 (34%)	71 (23%)	0.02
Cervical cancer risk reduction for women is necessary	517 (75.1%)	290 (76%)	227 (74%)	0.12
Should be administered to all adolescents	389 (56.5%)	215 (56%)	174 (57%)	0.35
Should be given to both genders, ages 9-25	453 (65.8%)	252 (66%)	201 (65%)	0.24
There is no need to vaccinate men	31 (4.5%)	14 (3.7%)	17 (5.5%)	0.001
Important to administer before sexual activity begins	465 (67.5%)	259 (68%)	206 (67%)	0.13
Should be given to all sexually active individuals	471 (68.3%)	250 (66%)	221 (72%)	0.06
Should be administered to adolescent girls	442 (64.1%)	245 (64%)	197 (64%)	0.48
The vaccine is included in the regular vaccination schedule	54 (7.8%)	30 (8%)	24 (8%)	0.31
The vaccine is available for a fee	491 (71.3%)	274 (72%)	217 (71%)	0.09
Attitude and Hesitation Items				
Response				
Due to the cost of the vaccine	266(39.2%)	147 (55%)	119 (39%)	0.08
Unaware of the vaccine's existence	232 834.2%)	122 (53%)	110 (36%)	0.04
Being male and believing not to be in a risk group	95 (14.0%)	60 (20%)	35 (11%)	0.009
Not fearing HPV infection	59 (8.7%)	36 (13%)	23 (8%)	0.04
Fear of vaccination itself	26 (3.8%)	15 (5%)	11 (4%)	0.17
Lack of belief in the vaccine's effectiveness	8 (1.2%)	5 (2%)	3 (1%)	0.19

*p<0.05

Table 6: Multivariate Analysis of Factors Associated with Willingness to Receive HPV Vaccine

Variables/Criteria	Total	Received	Not Received	Close Contacts	No Close	Fisher's Exact Test (p-value)
		HPV Vaccine (n=24)	HPV Vaccine (n=663)	Diagnosed (n=32)	Contacts Diagnosed (n=655)	
Mean Age	20.6	21	20.5	22	20.5	0.2
Gender (Female)	413	15	398	19	394	0.01
Gender (Male)	274	9	265	13	261	0.02
Had Heard of HPV	629	23	606	31	598	0.03
Close Contacts Diagnosed	32	12	20	-	-	0.001
No Close Contacts Diagnosed	655	12	643	-	-	0.001

*p<0.05

DISCUSSION

In an effort to comprehend the landscape of awareness, knowledge, and attitudes regarding Human Papillomavirus (HPV) and its associated vaccine, our study concentrated on a particularly significant demographic: medical students at Afyonkarahisar University Faculty of Medicine. The significance of this population is two-fold. Firstly, these individuals represent upcoming healthcare providers who have the potential to shape public health policies and medical procedures.

Secondly, their demographic attributes, which include a lower median age and a predominant single status, render them a particularly pertinent group for HPV prevention strategies.

One of the most salient findings of our study is the paradoxical coexistence of high awareness levels with substantial gaps in detailed knowledge concerning HPV. While 91.6% of the respondents had heard of HPV, only 14.7% possessed comprehensive knowledge about its transmission modes, associated health conditions, and prevention methods.

The incongruence between these two metrics is especially concerning considering their future roles in healthcare delivery and public health advocacy. These findings corroborate and exacerbate the existing literature on the subject. Prior studies have also revealed high awareness but low in-depth knowledge of HPV among healthcare students and professionals (8, 14, 15). However, what lends weight to our findings is the context within a medical education environment, which theoretically should serve as a conduit not only for awareness but also for a nuanced understanding.

The source of this information adds layers of complexity to these findings. Academic curricula emerged as a significant source of HPV information, but the secondary role of social media (42.3%) raised concerns about the quality and reliability of the information being consumed. Prior research substantiates the double-edged role of digital platforms, specifically the internet and social media, in public health awareness. They have proven to be instrumental in disseminating information but are also breeding grounds for misinformation (16, 17).

Our study also delineated significant sex-based disparities in HPV awareness, particularly concerning its role in cervical cancer. This finding resonates with the extant literature, indicating that public health messaging around HPV often disproportionately focuses on women, specifically those related to cervical cancer (2, 18). The statistical significance ($p=0.002$) of this gender-based discrepancy in our study amplifies the need for public health campaigns to adopt a more nuanced, gender-sensitive approach.

Disturbingly, these knowledge gaps are associated with low vaccination rates. With only 3.5% of the cohort having received the HPV vaccine, the figure stands in sharp contrast to vaccination rates of 17–49% reported in other studies focusing on healthcare professionals (5, 19). The major cited barriers—economic factors and lack of awareness—echo the larger discourse on vaccine hesitancy and access (20). These data further support the need for policy interventions, possibly through subsidized vaccination programs or inclusion in routine immunization schedules.

Interpreting these findings within the context of medical students at the Afyonkarahisar University Faculty of Medicine provides several compelling avenues for future intervention and research. First, the medical curriculum demands immediate restructuring to include comprehensive HPV modules that foster awareness and impart detailed evidence-based knowledge. Second, a more gender-inclusive public health messaging strategy is needed to bridge the identified gaps in awareness. Finally, considering the dismal vaccination rates, economic interventions are urgently required.

In conclusion, our study lays bare the urgent need for a multi-pronged approach, incorporating curricular reform, public health messaging, and economic interventions, to address the chasm between awareness and actionable knowledge among future healthcare providers. These students are not just passive education recipients but active future agents of healthcare delivery and policy formulation.

Thus, the observed gaps in their HPV-related awareness and knowledge are not merely academic concerns but harbingers of a potential public health crisis, requiring immediate and concerted action.

Limitations

The study is subject to potential selection bias, as the participants, who are medical students, might inherently be more interested in healthcare topics, although this makes the knowledge gap alarming.

Implications and Future Directions

1. **Medical Curriculum:** There is an urgent need to augment the medical curriculum to address these gaps, perhaps by introducing comprehensive HPV modules.
2. **Public Health Campaigns:** Our findings suggest the need for public health campaigns to broaden their reach and to include targeted messaging for men.
3. **Economic Interventions:** Given the low vaccination rates, there should be considerations for financial subsidies to encourage HPV vaccination uptake.
4. **Longitudinal Studies:** Subsequent research could encompass longitudinal evaluations of attitudes and uptake rates following educational interventions, along with an exploration of vaccine hesitancy.

CONCLUSION

In conclusion, this study uncovers a concerning disparity between the theoretical knowledge possessed by medical students at Afyonkarahisar University and their current practical comprehension of HPV and its vaccination. It prompts the medical community to reassess current educational frameworks and integrate more comprehensive HPV education, thus better equipping future healthcare providers for effective patient education and advocacy. Given their imminent roles as healthcare providers, their impact on forthcoming patient vaccination decisions holds significant importance. Therefore, immediate and multifaceted educational and policy interventions are imperative in cultivating a healthcare system that places greater emphasis on proactive prevention rather than mere reactive treatment.

By contextualizing these findings within the existing literature, this study contributes to a nuanced grasp of HPV awareness and knowledge among future healthcare providers, offering targeted recommendations for policy and educational reforms.

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Ethical approval: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions.

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