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Understanding HPV Vaccine Hesitancy: Knowledge, Attitude, and Willingness Towards Vaccination among Young Adults

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Abstract

Human papillomavirus (HPV) is a significant global health issue, but its vaccination coverage is currently low in the majority of the low- and middle-income countries, including Pakistan. Lack of knowledge, cultural, and vaccine safety issues are some of the mechanisms behind hesitancy among young adults, making them more vulnerable to HPV-related malignancies. This research sought to assess the levels of knowledge, attitudes, vaccine acceptance, and HPV vaccine hesitancy among Pakistani youth using the Knowledge-Attitude-Practice (KAP) model and to identify the main obstacles and enablers affecting the vaccine strategy. It was a cross-sectional survey on the same population, i.e., 201 young adults aged 18-29 years of Islamabad, Rawalpindi, and Karachi. A designed questionnaire was used to measure HPV knowledge, attitudes, vaccine hesitancy and willingness, causal sources of information, and perceived barriers. Descriptive statistics summarized the participants' characteristics, and correlation analysis was used to identify relationships among knowledge, attitude, hesitancy, and willingness. Findings indicated moderate levels of HPV knowledge (56.2%) and attitudes (52.7%), high hesitancy (44.8%), and low willingness to receive the vaccine (29.9%). The key source of information (58.2 %) was the media, even though parental influence was significant (53.7 %), as was the fear of side effects (33.8%). There was a positive relationship among knowledge, attitude, and willingness, and a strong negative relationship between knowledge and hesitancy. The awareness, but significant distrust, and safety concerns among Pakistani youth towards HPV vaccination are moderate. The research results indicate the need for culturally specific educational activities, enhanced healthcare communication, and community-based interventions to reduce hesitancy and reinforce vaccine uptake.

Keywords. Knowledge-Attitude-Practice (KAP), Human Papillomavirus (HPV), Pakistan, Youth, Knowledge, Attitude, Acceptance, Rejection, Hesitancy.

Introduction

The Knowledge-Attitude-Practice (KAP) model is a theoretical framework that offers a framework to comprehend how people obtain health-related information, develop attitudes, and eventually adopt preventive practices (Zarei et al., 2024). In the framework of human papillomavirus (HPV) prevention, the KAP framework highlights that correct knowledge about HPV and its vaccine can help to develop positive attitudes and increase the chances of vaccination uptake, and

misconceptions or lack of knowledge hinder vaccination practices despite the availability of vaccines (Wu et al., 2023). Cervical cancer remains one of the most preventable yet deadliest cancers worldwide; in 2020, an estimated 604,127 new cases and 341,831 deaths were reported globally, with approximately 90% linked to persistent high-risk human papillomavirus (HPV) infection (Ferlay et al., 2021; Sung et al., 2021; WHO, 2022). HPV vaccination is an effective and proven preventive measure against HPV-related cancers and genital warts (Donadiki et al., 2014; Apaydin et al., 2018), which can significantly decrease the rate of infections in countries that have introduced national vaccination programs (Bruni et al., 2020). In high-income nations, screening and vaccination programs have been effective in reducing the incidence of cervical cancer (Hull et al., 2020). Conversely, low- and middle-income nations have significant difficulties in the implementation of such programs, which results in disproportionately high morbidity and mortality. Nevertheless, HPV infection is still very common among young adults, with many of them being in the category of the so-called missed opportunity, i.e. people who have grown out of school-based immunization programs and are not vaccinated (Dunne et al., 2006; Dunne et al., 2011). The level of HPV vaccination in Pakistan is very low, and recent statistics show that less than 10 percent of adults are vaccinated (HPV Vaccine Awareness and Acceptability in Pakistan Survey, 2024). Thus, Pakistani young people are a high-risk group to evaluate the level of knowledge, attitudes, acceptance, and reluctance to HPV vaccination. Local studies in Pakistan show that the level of knowledge and vaccination coverage is equally low. Shaikh et al. (2019) found that in their study, only 18 participants had been vaccinated against HPV, and that there were significant correlations between vaccination and educational attainment. In Pakistan, the new evidence demonstrates that these difficulties are of particular interest. Recently, research indicates disturbingly poor rates in respect to proper HPV knowledge, deep-routed misunderstandings, and negative cultural awkwardness regarding HPV-related debates, even among the educated population (Awan et al., 2023; Ibrar et al., 2025). All these results indicate that knowledge gaps and false fears tend to be more effective obstacles than real adverse experiences.

The success of the HPV vaccine depends on the level of public awareness, the correctness of the perception of HPV risks, and the readiness to take preventive measures (Rathod et al., 2023). Knowledge of vaccine acceptability is critical to developing communication strategies that can address concerns, address misinformation, and establish trust (Olusanya et al., 2023). The role of knowledge, attitudes, and beliefs in HPV vaccine acceptance is always evident in international literature. As an example, Almaghlouth et al. (2022) discovered that only 4% of their Saudi sample was vaccinated, and the absence of information and perceived good health were the most common reasons to refuse. Taken together, there is a troubling gap in awareness and prevention activities among Pakistanis as a collective that could be either persistent or threatening as a result of low levels of health literacy, sociocultural sensitivities, and the lack of certainty about vaccines and their need (Atif et al., 2025; Ibrar et al., 2025; Awan et al., 2023). Policy-oriented studies that have been conducted recently further emphasize the fact that unless perception and health system preparedness are both tackled, the introduction or the expansion of HPV vaccination in Pakistan will not be likely to achieve meaningful coverage (Noreen et al., 2025). In general, the evidence shows a severe knowledge-preventive vaccination behavior gap among the youth. The primary purpose of this study is to evaluate the knowledge, attitudes, vaccine acceptance, and vaccine hesitancy of Pakistani youth with regard to HPV-related knowledge by using the Knowledge-Attitude-Practice (KAP) framework to determine the major barriers and facilitators of HPV vaccination behavior.

Materials and Methods

Study Design

This cross-sectional study evaluated knowledge, attitudes, vaccine hesitancy, and willingness toward HPV vaccination among young adults in Pakistan. Conducted over three months, this design provided a snapshot of current HPV awareness, vaccination attitudes, and hesitancy, offering insights into factors influencing vaccine uptake.

Study Setting

Data were collected across multiple urban and semi-urban areas of Pakistan, including Islamabad, Rawalpindi, and Karachi. Settings included universities, libraries, and public parks to capture variation in education, occupation, family structure, and healthcare access.

Study Population

The target population comprised adults aged 18–29 years.

Sampling

A convenience sampling technique was employed. Based on standard recommendations for questionnaire-based studies, the sample should be 5–10 times the number of items (Yu et al., 2015). The main questionnaire included 34 items (excluding demographics), indicating a minimum sample of 170–340 participants. Including demographic items (total 40 items), the recommended sample was 200–400. A total of 201 participants completed the survey and were included in the final analysis.

Inclusion criteria: Participants aged 18–29, residents of the study regions, and able to provide informed consent.

Exclusion criteria: Individuals outside the age range, non-residents, or unable to complete the questionnaire.

Data Collection

Data were collected using a structured questionnaire comprising four main sections: informed consent and demographics, HPV knowledge, attitudes and vaccine hesitancy, and sources/barriers/resistance. Standardized instructions were provided, and responses were monitored for completeness and consistency.

Instruments

The level of HPV knowledge was measured with a 13-item questionnaire based on the version used by Harrison et al. (2021), with 1 indicating correct, 0 indicating wrong, or I do not know ($\alpha = 0.79$). It was assessed using five items, adjusted based on Yildirim and Kizik (2025), on a 5-point Likert scale ($a = 0.86$). There were four items, modified to match the study by Almaghlouth et al. (2022), and willingness was measured using a direct intention item ($a = 0.84$). The indicator of vaccine hesitancy was assessed by nine items modified on the basis of the WHO SAGE scale (Larson et al., 2015) ($a = 0.92$).

Statistical Analysis

Data were analyzed using SPSS Version 26. Descriptive statistics summarized participant demographics, knowledge, attitudes, hesitancy, and willingness. Correlation analysis examined relationships between knowledge, attitude, hesitancy, and willingness. Categorical outcomes, such as willingness (Yes/No/Can't Decide), were reported as frequencies and percentages. A p-value < 0.05 was considered statistically significant.

Data Quality Control

Survey administration included standardized instructions and monitoring to ensure accuracy. Responses were screened for completeness and consistency; incomplete or invalid questionnaires were excluded from analysis.

Results

The current research sought to assess the levels of knowledge, attitudes, vaccine acceptance, and HPV vaccine hesitancy and barriers among Pakistani youth. Results provide a comprehensive overview of participant's demographic characteristics. The sample size was 201 respondents with an average age of 22.78 years, which are mostly young adults. The majority of the participants were male (62.2%), and they lived in nuclear families (66.2%). The sample was well-educated with a majority having BS or Master-level education (62.2%). Regarding occupational status, 61.7% were students, and 25.9% were full-time employees. The majority of the respondents were single (59.2%), and fewer were committed or married. In general, the sample is a young, educated, and mostly male population.

Table 1: ***Characteristics of the participants (N = 201)***

Characteristics	Categories	*f*	*%*	*M*
Age				22.78
Gender	Male	125	62.2	
	Female	76	37.8	
Family Type	Nuclear	133	66.2	
	Joint	68	33.8	
Education Level	Matric	2	1.0	
	FA\FSC	28	13.9	
	BA\BSC	45	22.4	
	BS/Masters	125	62.2	
	Higher	1	.5	
Occupational Status	Student	124	61.7	
	Employed (Full-time)	52	25.9	
	Employed (Part-time)	25	12.4	
Marital Status	Single	119	59.2	
	In Relationship	16	8.0	
	Committed	41	20.4	
	Married	25	12.4	

Table 2: ***Knowledge and awareness of participants about HPV (N = 201)***

Items	Responses	Incorrect	Correct
Only women can get infected with HPV	*f*	71	130
	%	35.3	64.7
HPV can cause cervical cancer in women.	*f*	71	130
	%	35.3	64.7
HPV can cause cancer in areas such as the head and neck.	*f*	131	70
	%	65.2	34.8
HPV causes cancer in women only.	*f*	64	137
	%	31.8	68.2
HPV can cause genital warts.	*f*	75	126
	%	37.3	62.7
A person could have HPV for many years without knowing it.	*f*	70	131
	%	34.8	65.2
HPV is transmitted through sex.	*f*	62	139
	%	30.8	69.2
Most people infected with HPV have visible signs or symptoms of the infection.	*f*	122	79
	%	60.7	39.3
A person's chances of getting HPV increase with the number of sexual partners they have.	*f*	81	120
	%	40.3	59.7
Nearly all sexually active people will contract HPV at some point.	*f*	137	64
	%	68.2	31.8
The HPV vaccine is only recommended for girls.	*f*	78	123
	%	38.8	61.2
Full protection against HPV requires more than 1 dose of the vaccine.	*f*	126	75
	%	62.7	37.3
The HPV vaccine is most effective if given to people who have not yet started having sex.	*f*	101	100
	%	50.2	49.8

There was a significant difference in the level of knowledge among items. A significant number of respondents were able to identify that HPV can be contracted by both men and women (64.7%). There was also moderate awareness that HPV is the cause of cervical cancer (64.7%). Nevertheless, 34.8% were aware that HPV can cause head and neck cancers, indicating a lack of knowledge about wider HPV-related illnesses. There were still misconceptions, including the idea that HPV causes cancer in women only (31.8% wrong). Even though 69.2% were aware of sexual transmission, and 65.2% were aware that HPV can be asymptomatic, over half mistakenly thought that the majority of infected people have visible symptoms. There was also partial but incomplete knowledge of vaccine-specific problems (e.g., multi-dose requirement, early vaccination).

Table 3: ***Attitudes of participants towards HPV and HPV vaccination (N = 201)***

Items	Responses	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
HPV is a serious health problem.	*f*	75	56	24	38	8
	%	37.3	27.9	11.9	18.9	4.0
I believe HPV vaccination is effective in preventing cancer.	*f*	50	48	56	32	15
	%	24.9	23.9	27.9	15.9	7.5
It is recommended that the HPV vaccine should also be administered to males.	*f*	53	48	62	16	22
	%	26.4	23.9	30.8	8.0	10.9
I feel concerned about receiving the HPV vaccine (e.g., side effects, safety).	*f*	10	30	80	40	41
	%	5.0	14.9	39.8	19.9	20.4
I would get the HPV vaccine if it were free.	*f*	36	49	81	24	11
	%	17.9	24.4	40.3	11.9	5.5

Attitudes showed ambivalent patterns. Most people considered HPV to be a severe health issue (65.2% strongly agree and agree). But the perceptions regarding the effectiveness of vaccines were not as high, and only 48.8% of people agreed that it prevents cancer. Male vaccination was moderately supported (50.3%). The issue of vaccination safety was also apparent, with 39.8% of the respondents being neutral and a significant percentage of the respondents disagreeing or strongly disagreeing with trust in vaccine safety. Nevertheless, 42.3% expressed readiness to be vaccinated in case it was free. In general, the attitudes were moderately positive but hesitant in terms of safety and effectiveness.

Table 4: ***Perceived Hesitancy of participants towards HPV Vaccine (N = 201)***

Items	Responses	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The information I receive about the HPV vaccine from my health care provider is reliable and trustworthy.	*f*	18	32	26	96	29
	%	9.0	15.9	12.9	47.8	14.4
The HPV vaccine is effective.	*f*	32	38	41	60	30
	%	15.9	18.9	20.4	29.9	14.9
Getting the HPV vaccine is a good way to protect myself from developing HPV-related cancers.	*f*	35	41	25	67	33
	%	17.4	20.4	12.4	33.3	16.4
The HPV vaccine is beneficial for me.	*f*	33	29	34	63	42
	%	16.4	14.4	16.9	31.3	20.9
I do/did what my healthcare provider recommends about HPV vaccine.	*f*	15	27	48	69	42
	%	7.5	13.4	23.9	34.3	20.9
The HPV vaccine is important for my health.	*f*	29	32	7	94	39
	%	14.4	15.9	3.5	46.8	19.4
Getting the HPV vaccine for me is important for the health of others in my community.	*f*	31	33	13	104	20
	%	15.4	16.4	6.5	51.7	10.0
The HPV vaccine has not been around long enough to be sure it's safe.	*f*	1	26	16	84	74
	%	.5	12.9	8.0	41.8	36.8
I am concerned about serious side effects of the HPV vaccine.	*f*	15	15	36	57	78
	%	7.5	7.5	17.9	28.4	38.8

Attitudes toward vaccine-related information and trust were high in hesitancy. Almost half of the respondents (47.8%) did not agree that healthcare provider information was reliable. The percentage of those who thought the vaccine was effective was only 34.8, and the long-term safety was still a major concern, with 36.8 strongly disagreeing that the vaccine is too new to be safe. There was great concern regarding serious side effects with 45.9% disagreeing that side effects were a concern, but 38.8% strongly disagreeing with little concern. These results demonstrate a high level of mistrust and uncertainty about HPV vaccination.

Table 5: ***Frequency of different levels of study variables (N = 201)***

Question	Response	*f*	*%*
HPV knowledge	Low	52	25.9
	Moderate	113	56.2
	High	36	17.9
Positive Attitude towards vaccination	Low	50	24.9
	Moderate	106	52.7
	High	45	22.4
Vaccine Hesitancy	Low	66	32.8
	Moderate	45	22.4
	High	90	44.8
Willingness towards HPV vaccination	Unwilling	141	70.1
	Willing	60	29.9

The majority of the respondents showed moderate knowledge of HPV (56.2%), and the attitudes toward vaccination were also predominantly moderate (52.7%). Almost half of the sample (44.8) showed hesitancy, which is a sign of reluctance and mistrust. Notably, the desire to be vaccinated was low, with 70.1% indicating that they were unwilling. These findings indicate a trend of moderate awareness and high reluctance and low acceptance of vaccination.

Table 6: ***Perceptions, Willingness, and Barriers of Participants toward HPV Vaccination (N = 201)***

Question	Response	*F*	*%*
How did you learn about HPV?	Healthcare professionals	35	17.4
	Media (TV, internet)	117	58.2
	Friends or family	27	13.4
	Self-study (Books or Articles)	22	10.9
In general, how do you feel about vaccinations?	Positive	72	35.8
	Neutral	23	11.4
	Negative	106	52.7
Are you willing to receive the HPV vaccine which can protect against HPV infection?	Yes	96	47.8
	Cannot Decide	45	22.4
	No	60	29.9
Would you recommend the HPV vaccine for a friend or relative?	Yes	73	36.3
	Cannot Decide	55	27.4
	No	73	36.3
Would you recommend the HPV vaccine for a child or adolescent (age between 9 and 12 years old)?	Yes	100	49.8
	Cannot Decide	44	21.9
	No	57	28.4
If you have not received the HPV vaccine, what are the main barriers for you?	Already healthy	56	27.9
	It is not beneficial	5	2.5
	Family does not allow	12	6.0
	Concerned about side effects	68	33.8
	Lack sufficient information	60	29.9
If any, what were the main sources of resistance for you?	Parents	108	53.7
	Other family members	10	5.0
	Friends or peers	7	3.5
	Religious/community leaders	9	4.5
	No resistance faced	67	33.3

The majority of participants were informed about HPV through media (58.2%), with little impact of healthcare providers (17.4%). The overall attitudes towards vaccination were mostly negative (52.7%), which is consistent with previous hesitancy scores. Almost half (47.8) were ready to take the HPV vaccine, and 29.9% were not. Suggestions to others were split in the same way. The most common barriers were the fear of side effects (33.8%), the lack of information (29.9%), and the perception that one is already healthy (27.9%). The primary source of resistance was parental influence (53.7%). In general, significant obstacles were misinformation, fear, and parental pressure.

Discussion

The current paper examined the knowledge of HPV, attitude, vaccine acceptance, and vaccine hesitancy among Pakistani youth through the KAP framework. The results were contrasted with the current national and global evidence to place behavioral patterns and factors of HPV vaccination in perspective. The first objective was to identify what the participants knew about the transmission of HPV, health risks, and vaccination. Results of Table 2 showed that the overall knowledge was average, and 56.2% were represented by the moderate category (Table 5). There was reasonable awareness of HPV as sexually transmitted (69.2% and HPV as the cause of cervical cancer (64.7%), though there was a significant lack of knowledge about the less well-known information, including HPV-related head and neck cancers (34.8%). These results correspond to the ones of Atif et al. (2025), who also found that Pakistani university students had uneven HPV knowledge, especially in terms of misconceptions about non-cervical cancers and gender-based susceptibility. Nevertheless, Atif et al. reported a marginally greater awareness in terms of the schedule of vaccination doses than the current sample, which may be explained by variations in the educational exposure. On the same note, Awan et al. (2023) outlined the existence of significant knowledge gaps on cancer causes of HPV through the anal cancer context, and that much of awareness in Pakistan is extremely disease-specific and driven by culture-specific discourse. Their results also confirm the trend of moderate yet varied knowledge regarding various areas of health relating to HPV. Moreover, even according to Kumar et al. (2025), pharmacy students, who were supposed to be more knowledgeable, showed a great deal of misconceptions about the benefit of vaccination and its safety. This implies that this is a systematic educational deficit that goes beyond general youth groups. Taken together, findings of this objective and the external research show that young Pakistani people are not fully informed about HPV, which supports the necessity of organized public health education.

To examine the attitudes of participants toward HPV and HPV vaccination the Attitude Towards HPV Vaccination Scale was used and the findings were recorded in Table 5; which indicated that the proportion of individuals with moderate attitudes was 52.7%, and the knowledge levels of HPV severity were high (65.2% agreed it is a serious problem), merely 48.8 percent thought that the vaccine works, and 39.8 percent were not sure about the safety (Table 3). These trends indicate insecurity, especially as far as safety and perceived benefits are concerned. The results are consistent with Shamsi et al. (2024), who have also established that despite many Pakistani women acknowledging HPV as a severe health threat, their vaccination beliefs were dampened by the lack of safety as well as mistrust of the healthcare system. Their work pointed out that even awareness does not necessarily lead to strong attitudes. Kamal et al. (2024), in their turn, found that the reproductive-age women of Quetta displayed moderate attitudes but portrayed skepticism of the vaccine efficacy and necessity, particularly among the unmarried women. This is similar to the current results, where reluctance is more of a concern than ignorance. Also, Al Alawi et al. (2023) discovered that the attitude towards vaccines among Muslim communities is strongly influenced by the cultural and religious beliefs in place, with the acceptance being moderate, yet with continued skepticism towards its safety--again, in agreement with the neutral/mixed attitudes in the actual sample. Therefore, according to the analysis, social, cultural, and informational barriers determine the attitudes as opposed to mere lack of knowledge. Vaccine hesitancy was measured in Table 4 and summarized in Table 5, with 44.8 percent of the participants showing high hesitancy. There was also low trust of healthcare providers (24.9% of people saying that provider information is reliable), and side effects concerns were high (38.8% strongly agreeing that they are not concerned). Such results reveal strong mistrust and fearful hesitation. These findings are reinforced by Kisa and Kisa (2024), who found that religious expectations, misunderstandings, and ethical issues in the Islamic communities are determinants of reluctance, especially to vaccines

attributed to sexual health. This suggests their review focused on a lack of trust in vaccine safety-mostly reflective of the high levels of safety-related concerns here. Cadeddu et al. (2021) also determined that fear of side effects and mistrust of institutions are strongly linked to the vaccine hesitancy levels in adolescents around the world, which made it possible to conclude that these tendencies are not peculiar to Pakistan but rather global. Elsewhere, Lee et al. (2024) showed that the health beliefs of Pakistani mothers, particularly the fear of novelty and adverse effects, had a direct detrimental effect on the intention to take the HPV vaccination. The result that 36.8% of the current study respondents felt that the vaccine was not long enough is directly related to the results found by Lee et al. on health belief barriers. Combined, these comparisons affirm the soundness of these findings of this objective: hesitancy is caused by suspicions, fear, misinformation, and a lack of trust in health systems.

Furthermore, levels of HPV knowledge, positive attitudes, vaccine hesitancy, and willingness toward HPV vaccination was accessed where Most respondents in the knowledge and attitudes were in the moderate range, as indicated in Table 5; however, the hesitancy was high and willingness was low, as indicated in Table 5, with 70.1% being unwilling to take the vaccine. Such an allocation reveals the asymmetry of knowledge and actionable will, which characterizes a knowledge-practice gap according to the KAP model. These trends align very well with Luwen et al. (2025), who established that, despite the moderate conceptual knowledge that the Pakistani and Afghan women had of cervical cancer, these attitudes were not accompanied by acceptance or desire to have an actual vaccine due to structural, cultural, and family factors. Similarly, Atif et al. (2025) observed a similar trend with a moderate level of knowledge but a lack of motivation to implement, where fear, cost, and influence of relatives were found to be major discouraging factors. Besides that, Kamal et al. (2024) observed that in cases of moderate attitudes, willingness was low unless the recommendation of a physician and family approval were supporting. This implies that knowledge/attitudes are not sufficient determinants of behavior, which strengthens the main KAP concept that practice is determined by greater contextual factors. The sources of information, general feelings about vaccination, willingness to receive the HPV vaccine, recommendations to others, and perceived barriers to HPV vaccination were explored and results were reported in Table 6, which indicated that most of the participants were exposed to HPV through the media (58.2), but few were exposed through the health professionals (17.4). Over half (52.7) had overall negative attitudes to vaccination, and 33.8% said they were afraid of side effects as the biggest impediment. The greatest discouragement was through parents (53.7%). This fact aligns with the findings of Shamsi et al. (2024), who concluded that the media was the most prevalent source of information, rather than doctors, but misinformation transmitted via the media also increased the level of fear and confusion. One area of similarity in both articles is the low response by healthcare providers to the HPV education. Similar findings were found by Awan et al. (2023), who noted that cultural norms and those in a family play a more significant role in determining the decision to vaccinate or not, which is a strong aspect of understanding in many cases compared to scientific facts. Their result is consistent with the high parental resistance in the current sample. Kisa and Kisa (2024) also affirmed these observations, indicating that religious figures and elder members of the family often not only deter vaccination among Islamic societies but also do not allow them (people) to vaccinate even when accepting the beneficial effects of vaccines personally. Taken altogether, these studies substantiate the argument that these non-medical factors, media, family, and cultural norms, are the most powerful ones that influence HPV vaccine perceptions in Pakistan.

Limitations

This study employed convenience sampling in urban areas, which might not represent the rural areas with varied cultures and education statuses. There is a socially desirable and recall bias in self-report measures. The cross-sectional format prevents causal research involving interactions between variables. The gender rate of participation (a high percentage of males) can have contributed to attitudinal patterns, and using online/urban data collection sites may have omitted peripheral groups with low levels of digital or educational access.

Conclusion

This research showed moderate awareness with considerable levels of hesitancy and low intention toward HPV vaccination in Pakistani youth. The results of the correlational analysis established that greater knowledge enhances attitudes and diminishes reluctance, which indicates the KAP model. Such factors as cultural norms, misinformation, and distrust are significant impediments to vaccine uptake. Specific education and community participation are key to enhancing the level of HPV vaccination acceptance.

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