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Knowledge and Awareness toward Human Papillomavirus Vaccination among Pakistani Health Sciences Students

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Abstract

Human Papillomavirus (HPV) is one of the most common sexually transmitted infections in the world as well as one of the leading etiological factors of cervical cancer. In Pakistan awareness on HPV and its vaccine is still wanting especially among the students in the field of health sciences who will be future front line care providers. The purpose of this study was to determine the services and awareness of HPV vaccination among Pakistani students of health sciences studying various disciplines. The cross-section survey involved 520 students in the health sciences (Pharm-D, MBBS, Nursing, DPT and BDS students). A 34 item online structured questionnaire, which includes HPV knowledge, screening, vaccine and vaccine availability, was used. Analysis was done using descriptive statistics,

Mann Whitney Z-tests and Chi-square tests. The average mean of HPV knowledge was 8.73 (5.83 SD) and 76.0% of students reported their poor knowledge status. About 70.4% of them had heard about HPV, 75.0% had heard about vaccination campaigns, and 77.1% had encountered advertisements on HPV. Students who were older and those who had previous knowledge of HPV scored much higher ($p < 0.001$). The most mentioned barrier to vaccination was vaccine hesitancy and concerns (84.8%). Students of health sciences, Pakistan exhibited similar poor knowledge of HPV as regional studies.
The need of targeted education interventions, awareness campaign, curriculum integration is urgent.

1. Introduction

Human Papillomavirus (HPV) is a very prevalent sexually transmitted infection, and the primary cause of cervical cancer, the fourth most frequent cancer among women worldwide. One of the crucial preventable causes of cervical cancer across the globe is human papillomavirus. Persistent infection with high-risk HPV types, in particular HPV-16 and HPV-18 is tightlyassociated with the development of CINE and invasive cervical cancer. Cervical cancer continues to be a significant public health issue in the world with the most prevalent cases reported in the low and middle-income countries where there are no structured screening and HPV vaccination programs. HPV vaccination, screening of cervical cancer and immediate treatment of the precancerous lesions are identified by the World Health Organization as some of the main measures of eliminating cervical cancer [1]. HPV is highly prevalent on a global scale, with a rate of 11.7%, and a significant burden in low- and middle-income nations, such as Pakistan [2]. Cervical cancer is one of the most common gynecological cancers in Pakistan but screening efforts have not yet been developed and the coverage of HPV vaccination is abysmal.

Cervical cancer is one of the most common gynecological cancers in Pakistan but screening efforts have not yet been developed and the coverage of HPV vaccination is abysmal [3]. The HPV virus is classified as low-risk types (HPV 6, 11) which cause genital warts and high-risk (HPV 16, 18) which causes cervical, oropharyngeal, anal and other cancers of the anogenital area. Three vaccines are being used: the 9-valent Gardasil-9 (9vHPV), the quadrivalent Gardasil (4vHPV) and the bivalent Cervarix (2vHPV). Such vaccines have shown a maximum of 88% of HPV-related malignant tumors and genital warts in adolescent girls and young women [4].

Cervical cancer is one of the neglected reproductive health issues in Pakistan. Based on global cancer statistics, Pakistan is indicated to have a few thousand new cervical cancer cases and deaths each year, most being diagnosed at an advanced stage because of a low rate of screening, public awareness, social stigma, and insufficient preventive health care services. Other Pakistani studies have reported similar results, that HPV prevalence is different between populations and sampling, and that it is lower in general female populations and higher in women with cervical lesions or cervical cancer. This divergence indicates that the burden of HPV in Pakistan is likely to be under-reported since it is not common to conduct routine screening, surveillance, and population-level testing of HPV [5].

HPV vaccination is a good preventive measure in HPV-related cervical cancer. Nevertheless, HPV vaccination has not been a regular part of national immunization programs in Pakistan, and national coverage and adequate coverage of vaccine coverage have not been documented. This is in contrast to countries having school-based HPV vaccination programs wherein access in Pakistan is largely influenced by cost, availability, physician not being recommended, parents's lack of awareness, and sociocultural sensitivity of a sexually transmitted disease. These obstacles are especially crucial due to the fact that HPV-based knowledge might not immediately change into recognition of vaccine acceptance or intention to actually vaccinate [6].

Health-science students are a valuable target population as they will be future healthcare providers and they may be potential sources of vaccine counselling to the general population. Nevertheless, unless their understanding is complete or their development largely influenced by their exposure to the media, but not an educational system, they might not be able to do much to promote HPV prevention. Thus, the objective of the present study was to evaluate HPV-related awareness, knowledge, and intention to vaccination and perceived barriers in [medical/health-science/university] students in Pakistan. The authors also investigated the relationship between knowledge and intention to vaccinate, thus the significant gap in knowledge and behavior in HPV prevention [7].

1.1 Knowledge of Human Papillomavirus

Research findings and reports in the world have always yielded low awareness of HPV among young adults and health students. South Asian and Middle Eastern regional studies have indicated that most health sciences students are not well versed with the health transmission, prevention, and vaccination of HPV [8]. In Pakistan, there is limited published data on HPV knowledge in health professionals-in-training, and the existing literature indicates that there is a high level of knowledge gaps even in students anticipated to advise their future patients [9].

1.2 Awareness of Human Papillomavirus Vaccination

Having awareness of HPV vaccine is a crucial requirement to its acceptance and uptake. Research in Muslim-majority settings has shown that although some students might have heard of the HPV infection, the levels of awareness related to vaccination schedules and dosages, as well as vaccine protection, are significantly lower [9]. The obstacles to the adoption of vaccination such as cultural stigma, vaccine safety issues, and insufficient institutional campaigning have remained in the news.

1.3 Significance of the Study

Health science students (Pharm-D, MBBS, Nursing, DPT, and BDS degrees) are in a unique position to be future healthcare providers and establish vaccination in their communities. The proposed study will identify the knowledge and awareness of HPV vaccination among Pakistani students of health sciences and identify the key sociodemographic variables linked to the knowledge scores.

2. Materials and Methods

2.1 Study Design and Setting

A cross-sectional study was carried out descriptively on MBBS/Pharm-D/Nursing/health-science students in different universities of Lahore, Pakistan. The cross-sectional design was chosen since it will be possible to evaluate awareness, knowledge, and perceptions of vaccinations at one time among the target group.

2.2 Sample Size and Sampling

A total of 520 students of the health sciences were enrolled in the study. The Raosoft Sample Size Calculator was used to compute sample size with a margin of error of 5% and a confidence interval of 95%. Inclusion criteria: (1) enrolled in an accredited health sciences program; (2) age of 17-31 years; (3) able to read and respond in English; and (4) giving an informed consent. Data was used for the survey in the 2023-2025 academic year using an online survey platform.

2.3 Data Collection and Ethical Considerations

The survey utilized an online survey platform in the 2023-2025 academic year to gain data. Institutional email and social media were used to recruit the participants. Electronic informed consent was given by all participants. The appropriate Institutional Review Board permitted the study to go ahead. It was a voluntary and anonymous participation.

2.4 Measures

A questionnaire was used that was structured from the HPV Knowledge Scale by Waller et al. (2013) and items scored either True (1), False (1 for negatively-keyed items), or I Don't Know (0). This instrument had four sub-scales the following: HPV

Knowledge (15 questions), HPV Screening Knowledge (6 questions), HPV Vaccine Knowledge (7 questions), and Vaccine Availability (6 questions). The total amount of knowledge scored ranged from 0-34. Poor knowledge: below 50%; Moderate: 50–75%; Good: above 75%. Questionning was done in respect of Pakistan specific questions like awareness of campaign, exposure to the ad, intentions to vaccinate and perceived obstacles. Cronbach's Alpha = 0.952.

2.5 Statistical Analysis

Data analysis was done through SPSS version 26 (IBM Corporation, USA). As normality assumptions were not met Shapiro-Wilk and Kolmogorov-Smirnov tests have been performed and a non-parametric test has been performed. Measurement of knowledge was done by Z test of differences between subgroups. A Chi-square test was used to assess awareness-sociodemographic correlations. Significance threshold: $p < 0.05$.

3. Results

3.1 Sample Characteristics

These students were 520 Pakistani health sciences students (Table 1). The largest age group was 20–22 years (37.7%), followed by 23–25 years (31.9%). Most were single (88.8%). By discipline, Pharm-D (37.3%) was most common, followed by MBBS (32.9%), Nursing (17.9%), DPT (10.0%), and BDS (1.7%). The majority of students (71.0%) lived within Lahore city. Concerning HPV awareness, 70.4 % of people had heard about HPV, 75.0 % were aware of vaccination against HPV and 77.1 % had seen advertisements about HPV (Figure 3). 62.5% of the students said they would get the vaccine among all the subjects. The most frequently mentioned obstacle to vaccination (84.8) was the vaccine hesitancy and concerns (HC).

Table 1: Socio-Demographic Characteristics of Pakistani Health Sciences Students (n = 520)

Variable	Category	n (%)
Age Group	17–19	148 (28.5%)
	20–22	196 (37.7%)
	23–25	166 (31.9%)
	26–28	9 (1.7%)
	29–31	1 (0.2%)
Academic Year	1st	131 (25.2%)
	2nd	125 (24.0%)
	3rd	141 (27.1%)
	4th	99 (19.0%)
	5th	24 (4.6%)
Marital Status	Single	462 (88.8%)
	Married	55 (10.6%)
	Widow	3 (0.6%)
Field of Study	Pharm-D	194 (37.3%)
	MBBS	171 (32.9%)
	BDS	9 (1.7%)
	Nursing	93 (17.9%)
	DPT	52 (10.0%)
	MLT	1 (0.2%)
City of Residence		
Inside City		369 (71.0%)
Outside City		151 (29.0%)
Have you heard of HPV (SA6)	Yes	366 (70.4%)
	No	107 (20.6%)
	Don’t Know	46 (8.8%)

Awareness of HPV Vaccination Campaign	(Yes)	390 (75.0%)
	(No)	130 (25.0%)
Have seen any advertisement	(Yes)	401 (77.1%)
	(No)	119 (22.9%)
Intention to receive vaccine	(Yes)	325 (62.5%)
	(No)	195 (37.5%)
Biggest Barrier	LOA	41 (7.9%)
	HC	441 (84.8%)
	SE	19 (3.7%)
	NA	5 (1.0%)
	Others	14 (2.7%)

3.2 Knowledge of HPV Infection, Screening, Vaccine, and Vaccine Availability

Table 2 shows knowledge scores in all the four domains. Within the general HPV knowledge area, the greatest correct responses were with regards to; Men cannot get HPV [false] (86.5), HPV usually does not need treatment [true] (81.9) and HPV is very rare [false] (82.3). The least response rates were on those items that dealt with routes of transmission and HPV variety. The mean score of HPV knowledge subscale was 3.76 (SD 4.31). In the case of screening knowledge, 79.2% identified fallacy of same-day test results correctly. Mean screening score was 1.47 (SD 1.95). In the knowledge of the vaccines, 82.5% of the participants were correct in stating that the vaccine does not prevent all STIs. In the knowledge of the vaccines, 82.5% of the participants were correct in stating that the vaccine does not prevent all STIs. Mean vaccine score was 1.63 (SD 2.01). The average score of vaccine availability was 1.47 (SD 1.82). The mean score of knowledge was 8.73 (SD 8.53). Figure 2 shows knowledge level distribution: poor 76.0, moderate 21.0 and good only 3.1 among students.

Table 2: Assessment of Knowledge toward HPV, its Screening, Vaccine, and Vaccine Availability (n = 520)

Knowledge Domains / Items	N (%)
Knowledge about HPV score (Mean ± SD)	3.76 ± 4.31
1. HPV can be passed on during sexual intercourse [true]	350 (67.3%)
2. HPV can cause cervical cancer [true]	372 (71.5%)
3. HPV can be passed on by genital skin-to-skin contact [true]	385 (74.0%)
4. Using condoms reduces the risk of getting HPV [true]	363 (69.8%)
5. HPV can cause genital warts [true]	370 (71.2%)
6. A person could have HPV for many years without knowing it [true]	375 (72.1%)
7. HPV is very rare [false]	428 (82.3%)
8. Men cannot get HPV [false]	450 (86.5%)
9. There are many types of HPV [true]	357 (68.7%)
10. Most sexually active people will get HPV at some point [true]	376 (72.3%)
11. HPV can be cured with antibiotics [false]	424 (81.5%)
12. HPV always has visible signs or symptoms [false]	410 (78.8%)
13. Early sexual activity increases HPV risk [true]	377 (72.5%)
14. HPV can cause HIV/AIDS [false]	399 (76.7%)
15. HPV usually doesn't need treatment [true]	426 (81.9%)
Knowledge about HPV screening score (Mean ± SD)	1.47 ± 1.95
16. Positive HPV test guarantees cervical cancer [false]	402 (77.3%)
17. HPV test can be done with Pap test [true]	380 (73.1%)
18. Negative HPV test = low cancer risk [true]	381 (73.3%)
19. HPV testing indicates vaccine need [true]	402 (77.3%)

20. HPV test shows infection duration [true]	402 (77.3%)
21. HPV test results same day [true]	412 (79.2%)
Knowledge about HPV vaccine score (Mean ± SD)	1.63 ± 2.01
22. HPV vaccine protects against genital warts [true]	370 (71.2%)
23. HPV vaccine protects all STIs [false]	429 (82.5%)
24. Vaccinated girls don't need Pap test [false]	416 (80.0%)
25. Vaccine prevents cervical cancer completely [false]	418 (80.4%)
26. Vaccine protects against most cervical cancers [true]	381 (73.3%)
27. Vaccine most effective before sexual activity [true]	380 (73.1%)
28. HPV vaccine requires three doses [true]	403 (77.5%)
Knowledge about HPV vaccine availability score (Mean ± SD)	1.47 ± 1.82
29. Vaccine recommended for females 11–26 [true]	369 (71.0%)
30. Free HPV vaccine in national schedule [true]	406 (78.1%)
31. Vaccine allowed for males 11–26 [true]	389 (74.8%)
32. Vaccine given in schools [false]	404 (77.7%)
33. Vaccine licensed for 30–45 years [false]	403 (77.5%)
34. HPV vaccines protect against cervical cancer [false]	386 (74.2%)
Pakistan-Specific Additions	
35. Awareness of HPV vaccination campaign	390 (75.0%)
36. Seen HPV-related advertisements	401 (77.1%)
37. Intention to receive HPV vaccine	325 (62.5%)
Total Knowledge Score (Mean ± SD)	8.73 ± 8.53
Level of Knowledge	
Poor	395 (76.0%)
Moderate	109 (21.0%)
Good	16 (3.1%)

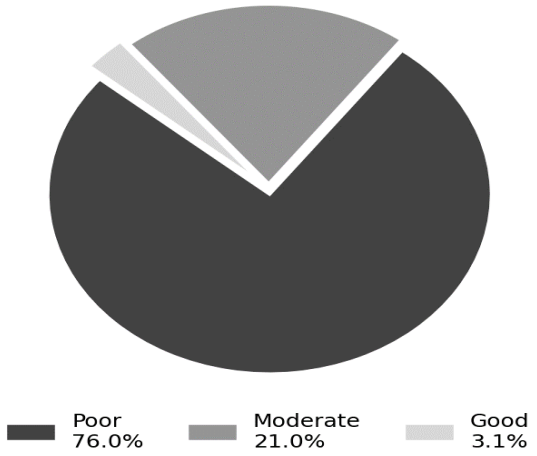

Figure 1: Level of Knowledge toward HPV among Pakistani Health Sciences Students (n = 520)

3.3 Differences in Knowledge Score by Sociodemographic Characteristics

As shown in Table 3, students aged 21–25 years had significantly higher knowledge scores (16.01 ± 6.65) than those aged 17–20 years (6.30 ± 7.67; $Z = -11.742$, $p < 0.001$). Senior students (Years 4–5) scored markedly higher (15.05 ± 7.29) than junior students (Years 1–3) (7.33 ± 7.83; $Z = -11.477$, $p < 0.001$). Awareness of HPV, awareness of the campain, and exposure to ads were all found to be significantly associated with higher scores ($p < 0.001$). Surprisingly, the mean score of students who did not want to get a vaccine (10.42 ± 9.08) was greater than the mean score of those students who wanted to get a vaccine (7.71 ± 8.03; $p = 0.001$) which indicates that knowledge is not the source of vaccination intent.

Table 3: Differences in Knowledge Score by Sociodemographic Characteristics and HPV Awareness (n = 520)

Factor	Knowledge score (34) Mean ± SD	Z-test	P-value
Age Group			
17-20 Years	6.30 ± 7.67	-11.742	<0.001*
21-25 Years	16.01 ± 6.65		
Academic Year Level			
Junior students (Year 1–3)	7.33 ± 7.83	-11.477	<0.001*
Senior students (Year 4–5)	15.05 ± 7.29		
City of Residence	City of Residence	**3.37**	City of Residence
Heard of HPV (SA6)			**0.001**
• Yes (n = 366)	9.36 ± 8.36		
• No (n = 107)	6.79 ± 8.44	**11.742**	
Heard of HPV testing (Awareness of HPV Vaccination Campaign)			**<0.001**
• Yes / True (n = 390)	6.30 ± 7.67		
• No / False (n = 130)	16.01 ± 6.65	**11.477**	
Heard of HPV vaccination (Have seen any advertisement)			**<0.001**
• Yes (n = 401)	6.44 ± 7.62		
• No (n = 119)	16.44 ± 6.75	**3.400**	
Intention to receive vaccine			**0.001**
• True (n = 325)	7.71 ± 8.03		
• False (n = 195)	10.42 ± 9.08	**3.320**	
Biggest Barrier*			**0.001**
• LOA (n = 41) (Lack of awareness)	12.63 ± 8.72		
• HC (n = 441) (High cost)	8.09 ± 8.42		

**Significant at p < 0.05. P-values calculated using Mann-Whitney Z-test.*

3.4 Awareness of HPV and Association with Sociodemographic Characteristics

Awareness-sociodemographic associations are presented in table 4. The awareness of younger students (17-22 years old) was mostly poor (232; 67.1%). The awareness level was significantly correlated with campaign awareness, academic year, exposure to advertisements and vaccination intent ($p < 0.001$). Figure 3 further demonstrates that, although 70.4% were aware of HPV, the awareness of HPV testing campaigns (75.0) and advertisements related to the vaccination (77.1) was relatively greater, showing that media exposure has to a certain extent surpassed formal education.

Table 4: Relationship between Awareness Level and Sociodemographic Characteristics (n = 520)

	Level of Awareness		
Factor	Poor Awareness N (%)	Good Awareness N (%)	P-value
Age Group	97 (65.5%)	7 (4.7%)	<0.001*
17-22 Years	232 (67.1%)	15 (4.3%)	
23-28 Years	162 (92.6%)	1 (0.6%)	<0.001*
Academic Year Level			
Junior students (Year 1–3)	296 (74.6%)	13 (3.3%)	
Senior students (Year 4–5)	99 (80.5%)	3 (2.4%)	<0.001*

Awareness of HPV Vaccination Campaign	390 (75.0%)	130 (25.0%)	<0.001*
	130 (25.0%)	390 (75.0%)	
Have seen any advertisement	401 (77.1%)	119 (22.9%)	<0.001*
	119 (22.9%)	401 (77.1%)	
Intention to receive vaccine	325 (62.5%)	195 (37.5%)	0.001*
	195 (37.5%)	325 (62.5%)	
Biggest Barrier	41 (7.9%)	—	0.001*
	441 (84.8%)	—	
	19 (3.7%)	—	
	5 (1.0%)	—	
	14 (2.7%)	—	

**Significant at $p < 0.05$. P-values calculated using Chi-square test.*

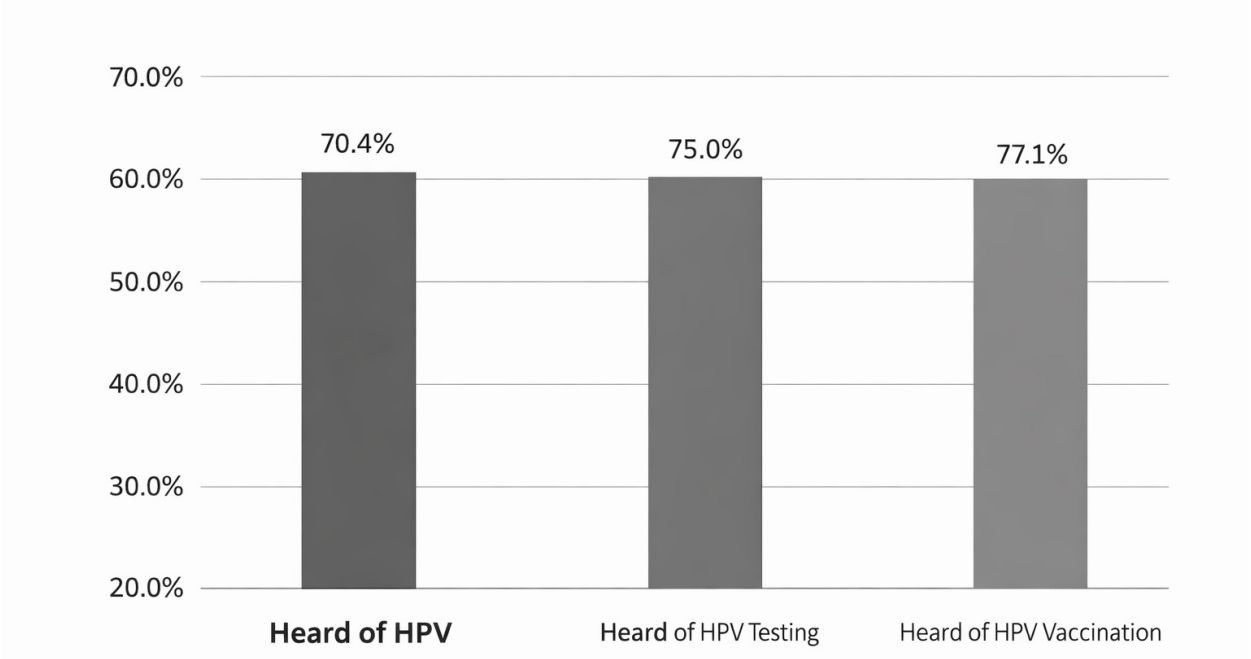

Figure 2: Assessment of HPV Awareness (Heard of HPV, Testing Campaign, and Vaccination Advertisement) among Pakistani Health Sciences Students (n = 520)

Though 70.4% of the respondents had heard about HPV, this did not translate into full and accurate knowledge. The evidence is that a considerable number of students might be familiar with the terminology of HPV but might not glean the true meaning of its transmission, association with cervical cancer, vaccinability, or relevance with screening. This difference is relevant as the superficial knowledge will hardly lead to preventive action, unless it is reinforced through the organized training.

This discovery that three-quarters of the respondents indicated campaign exposure and three-quarters indicated advertisement exposure indicates that HPV awareness might be media or promotion based rather than educational or clinical based. This could be the reason why the level of awareness was relatively high and underlying knowledge and preventive behavior was low. Within public health, this means that there is an information-quality gap: students might be subjected to HPV-related messages, but they might not be provided with sufficient medically accurate, culturally appropriate, and behavior-oriented information.

One of the main results of this research was that there was no significant correlation between HPV knowledge and vaccination intention. This shows the presence of knowledge-behavior gap, i.e. being aware about HPV does not necessarily result in the

willingness to vaccinate. This disparity can be determined by the perceived safety of vaccines, price, inadequate supply, stigma around sexually transmitted diseases, fear of social stigma, family support, and physician recommendation. Thus, the HPV prevention plan in Pakistan cannot be based solely on the awareness campaign; it has to touch upon the issues of hesitancy, affordability, access, and cultural acceptability.

4. Discussion

This paper investigated the knowledge and awareness levels of HPV in 520 Pakistani students of health sciences in different disciplines. The results indicate an ongoing gap in HPV knowledge with 76.0% of the respondents falling under poor knowledge category - similar to results in Saudi Arabia (81.6) reported by [10] and [11] and other Muslim-majority-related settings. Although the sample is bigger and more diversified, the general average knowledge rate of 8.73 (SD 8.53) on a 34 point scale indicates insufficient training of future healthcare providers.

The most correct response rates were with the basic types of misconception corrections - men getting infected by HPV (86.5%), and the vaccine not covering all STIs (82.5%). But awareness regarding the exact ways of transmission, dose of vaccines, and the fact that Pap smears are still required even after vaccination was still low. These trends are similar to [12], who found that 73.7% of Saudi medical students had incorrect beliefs regarding the transmission of HPV despite the awareness of vaccine.

The knowledge scores of senior students (Years 4-5) were higher and had significant differences ($p < 0.001$), which is consistent with [11] and proved that cumulative academic exposure is associated with the improvement of HPV knowledge. Nevertheless, the mean of senior students was 15.05/34, which means that a significant gap still exists, and it is possible to conclude that HPV curricular coverage has not yet been implemented in the field of health sciences.

One of the Pakistan-specific discoveries that have had strong policy implications is that vaccine hesitancy and concerns had been the most prevalent potential block to vaccination (84.8) - much greater than the rates in similar studies in the region where lack of awareness generally prevails[13]. It means that Pakistani health sciences students know about the existence of the vaccine but are not yet convinced in its safety or the need, and specific communication strategies are necessary, which has to deal with the evidence of vaccine safety and cultural acceptability.

The percentage of students who have heard about HPV (70.4) was higher than the one provided by [14], probably because of the multi-disciplinary sample (medical and pharmacy students). Notably, viewing HPV vaccination campaigns (75.0) and advertisements (77.1) was more than basic HPV awareness - although 76.0% still showed poor knowledge (Figure 2) suggests that exposure to passive media has failed to convert to substantive knowledge.

The dramatic correlations between knowledge scores, campaign awareness, and exposure to advertisements ($p < 0.001$) indicate the possible effectiveness of properly developed outreach programs conducted by the local public health in raising the level of knowledge and justify the extension of the targeted national HPV awareness campaigns in Pakistan.

The policy environment in Pakistan is not good as compared with other studies that have been carried out in the countries where HPV vaccination has been integrated into their national immunization programmes. There has been a growing uptake of HPV vaccination and reduction in HPV infection, genital warts and cervical pre-cancerous lesions in many high income countries and part of middle income medicines through school-based HPV vaccination campaigns. Pakistan on the other hand with its low programmatic assistance implies that HPV vaccination is an opportunity. This need not always be the case as an awareness or willingness gap may exist because of this policy.

The paper also emphasizes that healthcare students will also be critical in terms of future vaccine advocacy. Lack of medical, pharmacy, and nursing students knowledge and vaccine hesitancy towards HPV would potentially have consequence on future

counseling practice. One of the best predictors of vaccine acceptance is healthcare-provider recommendation. HPV education must thus be included in the medical, nursing and pharmacy and allied health curricula. The HPV transmission, burden of cervical cancer, vaccine safety, vaccine schedule, counseling skills, and culturally-appropriate communication strategies should be taught.

The other critical concern is the role of gender and academic discipline. Though gender-based analysis or discipline-wise analysis were not in the context of this study, these factors could have an impact on HPV knowledge and vaccine acceptance. Female students will find cervical cancer more personally relevant, and male students will be less susceptible perceived to HPV though other anogenital and oropharyngeal cancers are also caused by HPV. On the same note, senior medical students can be more learned than junior students or students who do not pursue clinical disciplines. Future research ought to analyze gender, discipline, academic year and source of information as predictors of HPV knowledge and vaccine intention.

4.1 Limitations

This cross-sectional design does not allow us to make causal inferences. The sample size was selected in single city's institution and might not be representative of the depths of Pakistani health sciences students. There are potential risks of recall bias and socially desirable responding with online self-administration. The sample was also restricted to the enrolled students, which did not allow generalisation to the practitioners or the general population. Future studies are suggested to use multi-centre, longitudinal designs with male and community participants.

5. Conclusion

The research revealed broad and clinically relevant knowledge and awareness gaps in HPV among Pakistani health sciences students which included more than three-quarters of participants with poor knowledge in all measured areas. The prevailing nature of vaccine skepticism and safety issues as opposed to simple lack of awareness as the key obstacle to immunization is a vital and actionable discovery specific to the Pakistani setting. Students who were senior and those that had prior exposure to HPV information were much better informed, a fact that underlines the importance of a continued, organized method of education.

As health sciences graduates will be the key players in the future advocating preventive health, HPV education should be formally incorporated in all health studies at the undergraduate level. Community-based outreach, culturally oriented educational resources, and awareness campaigns on the safety of vaccination interventions are needed to increase the vaccination rates and decrease the malignancy rates due to HPV in Pakistan.

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