Original Article

HPV vaccination knowledge, attitude, and practices among physicians in a teaching hospital, Karachi

Sehrish Habib Memon[1], Bhombhal Swaleha Tariq[2]

[1]Department of Family Medicine, Liaquat National Hospital and Medical College, Karachi, Pakistan, [2]Department of Family Medicine, Aga Khan University Hospital, Karachi, Pakistan

Abstract

Context: Cervical cancer is a global public health problem. It is the fourth most common cancer in women globally. Human papillomavirus (HPV) vaccine has reduced the incidence of HPV-related illness in the past decade. However, for the vaccination programs to be successful, recommendation by the primary care physicians is essential. **Aims:** The aim of this study was to evaluate the knowledge, attitude, practices, and barriers toward HPV vaccination among physicians practicing at a teaching hospital in Karachi, Pakistan. **Settings and Design:** This is a cross-sectional study carried out with a sample size of 165 among doctors practicing in Family medicine, Internal medicine, Pediatrics, and Gynecology outpatient clinics at a teaching hospital. **Methods and Material:** Physicians were approached in outpatient clinics, and a pilot-tested coded questionnaire was filled by them. **Statistical Analysis Used:** Data were analyzed using SPSS version 19. **Results:** Results show 22.4% males and 77.6% females participated in the study. 20% were internists, 35.2% were family physicians, 18.8% were pediatricians, and 26.1% were gynecologists. In terms of knowledge, 67.2% physicians showed good knowledge. In terms of attitude, it was found that 90.9% of physicians showed positive attitude toward prescribing HPV vaccine. However, only 37.5% physicians prescribed HPV vaccine to patients. Cost of vaccine, time constraints, and lack of knowledge among female patients were recognized as the most common barriers against prescribing the vaccine. **Conclusions:** From these results, we can infer that overall practices of our physicians are lacking, with respect to prescribing the HPV vaccine. Positive attitude should be taken as an advantage, and overcoming the barriers should be considered as the next step for improvement of our practice.

Keywords: Attitude, HPV vaccine, Karachi, knowledge, physicians, practices

Introduction

Cervical cancer is a global concern. It is the fourth most common cancer in women, ranking after breast, colorectal, and lung cancer, with around 660,000 new cases and 350,000 deaths in 2022. Developing countries have the highest incidence of cervical cancer.[1] Of these, the highest disease burden and mortality were seen in China and India, with around 106,000 cases in China and around 97,000 cases in India.[2]

Address for correspondence: Dr. Sehrish Habib Memon, Department of Family Medicine, Liaquat National Hospital and Medical College, Karachi, Pakistan.
E-mail: sehrish.habib111@gmail.com

Received: 06-05-2024 **Revised:** 07-08-2024
Accepted: 07-08-2024 **Published:** 13-01-2025

Access this article online

Quick Response Code:

Website: http://journals.lww.com/JFMPC

DOI: 10.4103/jfmpc.jfmpc_761_24

Controlling the disease in Pakistan has been a challenge. Due to lack of efficient epidemiological data collection, the only source of information is the cancer registries which are maintained by institutional and regional bodies. The annual number is over 5000. Of these, more than 3000 women lose their lives, which makes cervical cancer as the third leading cause of cancer-causing deaths in women.[3]

Vaccination against the oncogenic strains of human papillomavirus (HPV) and screening methods (Pap smear and HPV cytology) make cervical cancer a largely preventable disease.[4] The U.S. Food and Drug Administration (FDA) approved Gardasil (HPV4), a vaccine for four disease-causing strains of HPV, in 2006. The FDA then approved another vaccine, Cervarix

How to cite this article: Memon SH, Tariq BS. HPV vaccination knowledge, attitude, and practices among physicians in a teaching hospital, Karachi. J Family Med Prim Care 2025;14:132-8.

(HPV2), which protects against two oncogenic strains of HPV, in 2009. A nine-valent vaccine (Gardasil 9) was approved in 2014.[5] As of 2023, there are 6 HPV vaccines available. All protect against the oncogenic HPV strains: 16 and 18. It has dramatically reduced the incidence of HPV-related illness in the past decade. HPV is indicated for all girls 9–14 years of age before they become sexually active.

The WHO has developed a global strategy in an attempt to eliminate cervical cancer. It has set three goals to be achieved by the year 2030 to initiate all countries on the pathway to HPV elimination in the coming decades:

1. 90% of girls vaccinated with the HPV vaccine by age 15
2. 70% of women screened with a high-quality test by ages 35 and 45
3. 90% of women with cervical disease receiving treatment.[1]

Pakistan lacks an effective national HPV vaccination program due to limited resources. As a result, most of the women may be unaware of the existence of this vaccine.

Effective health education is a key component of any successful vaccination program.[6] However, for the vaccination programs to be successful, recommendation by the primary care physicians is essential. Doctors' knowledge of diseases caused by HPV and its vaccine is an important predictor of vaccine uptake by patients, and their recommendation is considered to be crucial for HPV vaccine acceptance. The success of vaccination programs in the prevention of cervical cancer depends largely on the doctor's knowledge of HPV vaccine.

Multiple studies have stated that the physician's recommendation is the strongest factor influencing parents in deciding whether to vaccinate their children. Studies in USA have shown that the HPV vaccine has reduced the prevalence of cervical cancer by 56% since the vaccine was approved in 2006.[7] A study conducted in Australia in 2007 concluded that national government-funded vaccination programs caused a significant decrease in HPV prevalence.[8]

One of the studies conducted in different cities of USA showed 98% of pediatricians and 88% of family physicians were prescribing HPV vaccines. The most frequently reported barrier to HPV vaccine was the vaccine costs (42%).[9] A Canadian study assessing practices of pediatricians, family physicians, and gyn/ob showed that 71% of gyn/ob, 54% of pediatricians, and 46% of family physicians are in the practice of routinely prescribing the HPV vaccine.[10] Another study conducted in the western region of Saudi Arabia stated that 68% of physicians were well aware about the HPV vaccine and would highly recommend it to their patients.[11] A study in Mangalore, India, showed that 47% of the physicians knew that HPV vaccine was approved for use in India, 30% reported that they recommend the HPV vaccine to their patients, and 73% were of the opinion that HPV vaccine is a major barrier to acceptance.[12] A study conducted in Karachi in 2009 explored the awareness about HPV vaccination in interns and nursing staff at a hospital setting, which was reported as low (approximately 9.3%).[13] Another qualitative study conducted in Karachi among female family physicians indicated some potential gaps between knowledge and practices of prescribing HPV vaccine. While most physicians seemed to support the vaccine, the majority of them were not fully aware of the practicalities such as target age, side effects, and vaccine availability.[8]

To the best of authors' knowledge, there are limited data available in Pakistan about knowledge and attitude of health care providers regarding HPV vaccine. Therefore, we aim to determine knowledge, attitude, and practices regarding HPV vaccination among health care providers in a teaching hospital of Karachi. On the basis of results, we will have an opportunity for implementation of HPV vaccine approval in health policy and in developing vaccination program educational material. Moreover, as family physicians, it is our role to offer primary prevention to our patients or parents of young patients. It is our duty to educate them and make them aware about protection against cervical cancer.

Subjects and Methods

Study design and setting

This was a cross-sectional study conducted at a tertiary care hospital, Aga Khan University Hospital in Karachi, among physicians from the following specialties: Family medicine, Internal medicine, Pediatrics, and Gynecology/Obstetrics. Data were collected from January 2020 to April 2020.

Inclusion and exclusion criteria

Inclusion criteria:

Minimum 12 months clinical experience

In the age group of 24–60 years.

Exclusion criteria:

Those who do not give written informed consent.

Ethical consideration

Ethical approval was taken from the ethical review committee before commencement of study. Written and informed consent from the participants was obtained. Data were kept confidential. Privacy was given to patients while filling the questionnaire. Interviewer bias can occur; therefore, to minimize its effect, the questionnaire was filled by participants themselves.

Sample size calculation and sampling technique

Sample size was calculated with WHO software for sample size determination. It was calculated on the basis of proportions obtained through the literature. From the literature review, we found that the prevalence of attitude among physicians regarding HPV vaccine was 50%. Based on these values, with

95% confidence interval and a bound on error of 7%, the sample size came out to be 165. The convenience sampling technique was adopted.

Study instrument

The questionnaire was designed by the principal investigator after thorough literature search, and the content was validated by other two experts of family medicine who were not part of this study.

The questionnaire is composed of four parts, including 40 items in all: Section A inquires about the demographic details (questions 1–6): age, gender, specialty, job category, years of clinical experience, and number of female patients 13–26 years old seen in a month.

Section B contains questions which assessed the knowledge about HPV infections and general practicalities of the vaccine (questions 7–18). The responses to 5 questions were multiple options with one correct answer, having at least four options to minimize the risk of bias. Responses to seven questions were binary (yes/no). Each correct answer was assigned a score of 1, and wrong items were recorded as 0. The total questions in this section are 12, so those scoring below 9 were marked as having inadequate knowledge about HPV vaccine and those scoring above 9 were marked as having adequate knowledge.

Section C (questions 19–21) assessed the practices regarding recommending HPV vaccine to the self and family members and in clinical practice. The responses were binary (yes/no). 'Yes' was assigned a score of 1, and 'No' was assigned a score of 0. Physicians were labeled as having good practice if they scored >/= 2/3.

Section D consisted of two parts. Part 1 (questions 22–26) contained questions regarding reasons for recommending the vaccine. The responses were binary (yes/no). Each answer was scored '1' if correct and '0' if incorrect. Those scoring below 3 were marked as not in favor of prescribing HPV vaccine, and those above or equal to 3 were marked as in favor of prescribing HPV vaccine. Part 2 (questions 27–40) contained questions regarding reasons for not prescribing the vaccine.

Data analysis

Data entry and analysis were done on SPSS version 19. The mean and standard deviation of continuous variables were calculated, such as age, years of experience, and score. Frequencies and percentages were calculated for categorical variables such as gender, qualification, area of practice, job category, and outcomes (knowledge, attitude, and practices). Effect modifiers such as age, gender, years of clinical experience, qualification, area of practice, and job category were controlled through stratification. Post stratification, Chi-square test was used to test the knowledge, attitude and practices of physicians about HPV vaccine. All the analyses were two-tailed, and *P* values of 0.05 or less were considered significant.

Results

Demographics

In this study, 165 physicians were included. The average age of physicians was 37.50 ± 9.75 years. The majority of the study participants were female (77.6%). 18.8% were pediatricians, 26.1% were gynecologists, 20% were internists, and 35.2% were family physicians.

Most of the responses were received from postgraduate trainees or medical officers (67%), 16% responses were from the junior faculty (senior instructor and lecturer), and 17% were from the senior faculty (Assistant professor, Associate professor, and Professor).

In terms of experience, 44.8% physicians had graduated less than 10 years ago. 37% had graduated 10–20 years ago. 18% had graduated more than 20 years ago.

Almost one third of physicians (33.9%) saw 20–30 adolescent patients in a month, and 45.5% physicians stated that they saw 10–20 patients of this age group in 1 month. 20% of physicians consulted more than 30 patients in this age group per month.

Knowledge

Table 1 summarizes the responses of participants to questions regarding cervical cancer and HPV vaccine. 62.7% participants had adequate knowledge, and 32.7% participants had inadequate knowledge. Pearson Chi-square test was applied to see the correlation between knowledge scores with independent variables. Doctors' age, job category [Table 2], and specialty [Table 3] were found to be statistically significant with a better knowledge score among family physicians and Ob/gyn specialists. Doctors' clinical experience and seniority had no association with knowledge score.

Practice

Table 4 summarizes the practices of physicians. 37.5% physicians showed good practices, and 62.4% showed poor practices in prescribing HPV vaccine. Pearson Chi-square test was applied to see correlation between practice scores and independent variables. Physicians' age, job category [Table 5], and specialty [Table 6] were found to be statistically significant with better practices among postgraduate trainee/ medical officers and senior faculties of family physicians and gynecologists.

Attitude

Table 7 summarizes responses of participants regarding attitude toward HPV vaccine. 90.9% physicians had positive attitude toward HPV vaccine recommendation. Clinical experience [Table 8] was found to be statistically significant with more recent graduates (<10 years clinical experience) showing positive attitude toward the vaccine.

Table 1: Distribution of knowledge

	Frequency of correct knowledge	% of correct knowledge
Mode of transmission.	159	96.4
Incidence of HPV infection is the highest in which age group.	73	44.2
Symptoms of genital HPV infection.	141	85.5
All strains of HPV cause cervical cancer.	165	100
Cervarix is a bivalent vaccine.	121	73.3
Gardasil is a quadrivalent vaccine.	121	73.3
HPV testing of women before prescribing the vaccine.	100	60.6
Pregnancy test is necessary before giving the vaccine.	67	40.6
HPV-infected female should be given the vaccine or not.	73	44.2
At what age group, the vaccine is recommended?	108	65.5
Gardasil can be given to:	118	71.5
Cervarix can be given to:	115	69.7

Table 2: Stratification of knowledge score with respect to job category

Variable	Groups	Knowledge		P Value
		Poor Knowledge f (%)	Good knowledge f (%)	
Job category	Postgraduate trainee/Medical Officer	39 (72.2%)	72 (64.8%)	0.039
	Junior Faculty	6 (11.1%)	19 (17.1%)	
	Senior Faculty	9 (16.6%)	20 (18.0%)	
	Total	54 (32.7%)	111 (67.2%)	

Table 3: Stratification of knowledge score with respect to specialty

Variable	Groups	Knowledge		P value
		Poor knowledge f (%)	Good knowledge f (%)	
Specialty	Pediatrics	10 (18.5%)	21 (18.9%)	0.000
	Gyn/Ob	4 (7.4%)	39 (35.1%)	
	Family Medicine	17 (31.5%)	41 (36.9%)	
	Internal Medicine	23 (42.6%)	10 (9.0%)	
	Total	54 (32.7%)	111 (67.2%)	

Table 4: Distribution of practice

	Yes	No	% of positive practice
Have you gotten the HPV vaccine yourself?	4	161	2.4%
Have you advised HPV vaccine to close family members/friends?	67	98	40.6%
Do you recommend HPV vaccine in your clinical practice?	90	75	54.5%

Further questions inquired about the reasons for not recommending the vaccine are summarized in Table 9. A major chunk of participants, 117 (70.9%), had concerns about the cost of the vaccine being too high to be the reason against recommending it. 93 (56.4%) physicians thought that parents are less attentive to vaccines once the child is greater than 5 years old. 112 (67.9%) participants did not advice the vaccine as it was not related to the reason of consultation. 53 (32.1%) believed in providing opportunistic care to their patients by prescribing the vaccine, no matter what the reason of consultation was. 107 (64.8%) did not prescribe the vaccine for fear of causing unnecessary anxiety among women/parents. 143 (86.7%) were not in favor of prescribing due to lack of knowledge in parents regarding HPV and cervical cancer.

Discussion

Our country is sixth in terms of population in the whole world, where the burden of noncommunicable diseases is responsible for 50.5% of overall disease burden. Pakistan has 59.04 million women in the reproductive age group who are at risk of cervical cancer.[14] Although the incidence of cervix cancer in Pakistan is lower than that in other developed nations, the mortality rate is high due to scarcity of awareness, lack of vaccination programs, unavailability of Pap smear test, and late presentation of cervical cancers.

Comprehensive and holistic care is the landmark of a trained family physician: Cancer screening and immunisation are crucial components of preventive care.

Primary care physicians have an important role in providing information about HPV vaccination, addressing misconceptions, and recommending vaccination to eligible patients. Perceived barriers about vaccinations may prevent uptake of vaccination.

Table 5: Stratification of practice score with respect to job category

Variable	Groups	Knowledge		P value
		Poor Practice f (%)	Good Practice f (%)	
Job category	Postgraduate trainee/Medical officer	72 (69.9%)	39 (62.9%)	0.0001
	Junior Faculty	18 (17.4%)	7 (11.2%)	
	Senior Faculty	13 (12.6%)	16 (25.8%)	
	Total	103 (62.4%)	62 (37.6%)	

Table 6: Stratification of practice score with respect to specialty

Variable	Groups	Practice		P value
		Poor Practice f (%)	Good Practice F (%)	
Specialty	Pediatrics	25 (15.2%)	6 (3.6%)	0.0001
	Gyn/Ob	15 (9.1%)	28 (17.0%)	
	Family Medicine	33 (20%)	25 (15.2%)	
	Internal Medicine	30 (18.2%)	3 (1.8%)	
	Total	103 (62.4%)	62 (37.6%)	

Table 7: Distribution of attitude

	Frequency of good attitude	%
Vaccine is effective against all disease (cervical cancer, genital warts, anal cancer) caused by HPV.	91	55.2%
Vaccine side effects include syncope	100	60.6%
Vaccine side effects include allergy	152	92.1%
Protects against cervical cancer.	162	98.2%
Recommended by colleagues/employees.	117	70.9%

The results of this study provide insight to the knowledge, attitudes, practices, and barriers that physicians in a teaching hospital in Karachi have in regard to HPV vaccine.

Clinical experience of physicians

In terms of experience, 44.8% physicians had graduated less than 10 years ago. This is comparable to the study by Sohail *et al.*,[15] which states that 73% of physicians were medical officers, house officers, or postgraduate trainees. This confirms the observation previously that the majority of the physicians were recent graduates who had recently started their training in teaching hospitals. Since around half the sample size consists of junior physicians, this could cause a bias in the attitude and practices domain, characteristics which a physician develops with experience.

Knowledge of physicians regarding HPV vaccine

In terms of knowledge, 32.7% physicians had inadequate knowledge regarding the HPV vaccine, and 67.2% physicians were found to have adequate knowledge. Job category and specialty were found to be statistically significant, with regard to subject knowledge. Junior physicians and gynecologists and family physicians were found to have a higher percentage of knowledge. Sohail *et al.*[15] state that 85.7% physicians had good knowledge regarding the HPV infection, but only 18.5% had average knowledge regarding the HPV vaccine. None had good knowledge about the HPV vaccine.

Results from our study can be comparable to a Polish study, which concluded 42% of gynecologists and 57% of family physicians had adequate knowledge about HPV vaccination.[16]

In a study conducted in India, around 50% of physicians had appropriate knowledge about the HPV and vaccine.[12]

A study from Saudi[17] showed that 61% of physicians displayed adequate knowledge for cervical cancer, and 58.38% displayed adequate knowledge for HPV vaccine.

Practices of physicians regarding HPV vaccine

As shown by collective score for practices in our survey, 37.5% physicians had good practices and 62.4% scored less, indicating poor practice. Gynecologists and family physicians were observed to have more positive practices. Almazrou *et al.*[17] stated that 66.47% physicians recommended HPV vaccine to 12–15-year-old girls, 87.86% recommended it to 16–21 years old patients, and 85.55% recommended it to women aged 21–26 years old.

Despite the majority of the physicians having adequate knowledge and showing positive attitude toward the HPV vaccine, the practices do not match these results. This disparity could be due to certain barriers against the vaccine, which gives physicians second thoughts before prescribing, despite having adequate knowledge and a positive attitude. The barriers are discussed below.

Attitude of physicians regarding HPV vaccine

The overall attitude of our physicians was encouraging as almost all of them consider it worthy of concern and understand their pivotal role in opportunistic care provision of their patients. 90.9% physicians had a positive attitude toward HPV vaccine recommendation. Rest 9.1% physicians had a negative attitude. Physicians who had graduated less than 20 years ago were observed to have more positive attitudes.

Table 8: Stratification of attitude score with respect to clinical experience

Variable	Groups	Attitude		P value
		Poor Attitude f(%)	Good Attitude f (%)	
Years since medical school graduation	<10 years	3 (1.8%)	71 (43%)	0.021
	10-20 years	11 (6.7%)	50 (30.3%)	
	20-30 years	0 (0%)	15 (9.1%)	
	>30 years	1 (0.6%)	14 (8.5%)	
	Total	15 (9.1%)	111 (67.2%)	

Table 9: Reasons for not recommending

	YES	NO
	Frequency and percentage	Frequency and percentage
Discussing sexuality is necessary before prescribing HPV vaccine.	78 (47.3%)	87 (52.7%)
Parental concerns about encouraging earlier or riskier sexual behavior.	65 (39.4%)	100 (60.4%)
Parental concern about advising vaccines against a sexually transmitted infection to preteen kids.	86 (52.1%)	79 (47.9%)
Concerned about syncope as a serious side effect of the vaccine.	39 (23.6%)	126 (76.4%)
Not being confident about safety and efficacy of the vaccine.	51 (30.9%)	114 (69.1%)
High cost of the vaccine.	117 (70%)	48 (29.1%)
Moral or religious concerns.	83 (50.3%)	82 (49.7%)
Parental concerns about efficacy of the vaccine.	61 (37%)	104 (63%)
Difficulty ensuring completion of vaccine series.	85 (51.5%)	81 (48.5%)
Limited consultation time.	88 (53.3%)	77 (46.7%)
Parental concern about adding another vaccine to the vaccine schedule.	85 (51.5%)	80 (48.5%)
Parents are less attentive to vaccines once the child is greater than 5 years old.	93 (56.4%)	72 (43.6%)
Vaccination is not related to the reason of consultation.	112 (67.9%)	53 (32.1%)
Would cause unnecessary anxiety among women/parents.	107 (64.8%)	58 (35.2%)
Lack of knowledge in parents/women regarding HPV and cervical cancer.	143 (86.7%)	22 (13.3%)

The results are comparable to a French study among GPs in which 72% of GPs reported having a positive attitude and used to prescribe the vaccine.[18] In Japan, though 53% agreed that the HPV vaccine should be recommended, only 21% reported educating patients about the vaccine.[19]

Perceived barriers against HPV vaccine

The most common barriers against prescribing HPV vaccine were discussing sexuality of the patient, vaccine cost, parental concerns against prescribing vaccine against an STI, lack of HPV vaccine awareness, and vaccine not being the reason for consultation.

These findings are in contrast to a French study which states that 26.9% GPs felt discussing sexuality was a major barrier against prescribing HPV vaccine, followed by GPs having doubts about the vaccine efficacy.[18]

Perceived barriers against HPV vaccination explored in our study can be comparable to a similar study conducted in Qatar,[20] where physicians stated the main hindrances against prescribing HPV vaccine was cost (24.6%), parental concerns for encouraging risky sexual behavior (26.8%), and safety of the vaccine (26.9%).

Canon *et al.*[12] state that reasons for not prescribing the vaccine included cost (17%), adverse effects (7%), and doubts about efficacy (20%).

Limitations: Data were collected from one private hospital in this study. This can be a limitation in this study.

Conclusion

Although clinicians were generally supportive of HPV vaccination, there was a discrepancy in the recommendation practices. This revealed a number of barriers to HPV vaccination at the physician and patient level, including knowledge, cost of the vaccine, and patient's acceptance of a vaccine against a sexually transmitted infection.

These barriers can be overcome by public awareness sessions or advertisements about cervical cancer and the preventive vaccine. Involving the government in making policies and potentially incorporating HPV vaccine in the vaccination program funded by the government can have a huge impact on physician recommendation and public acceptance of this vaccine.

List of abbreviations

HPV = Human Papilloma Virus.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Cervical Cancer. Available from: https://www.who.int/news-room/fact-sheets/detail/cervical-cancer#:~:text=Cervical%20cancer%20is%20the%20fourth,%2D%20and%20middle%2Dincome%20countries. [Last accessed on 2024 Apr 01].
2. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, *et al.* Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. Lancet Glob Health 2020;8:e191-203.
3. Bruni L, Albero G, Serrano B, Mena M, Collado JJ, Gómez D, *et al.* ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in Pakistan. Summary Report 10 March 2023. Available from: https://hpvcentre.net/statistics/reports/PAK.pdf. [Last accessed on 2024 Mar 27].
4. Centres for Disease Control and Prevention. HPV Vaccination Recommendations. Available from: https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html#:~:text=HPV%20vaccine%20is%20recommended%20for,not%20adequately%20vaccinated%20when%20younger. [Last accessed on 2024 Apr 01].
5. GAVI Alliance. Human Papillomavirus vaccine support. [Last accessed on 2020 Jan 25].
6. Tabrizi SN, Brotherton JM, Kaldor JM, Skinner SR, Cummins E, Liu B, *et al.* Fall in human papillomavirus prevalence following a national vaccination program. J Infect Dis 2012;206:1645-51.
7. Rosen BL, Shepard A, Kahn JA. US health care clinicians' knowledge, attitudes, and practices regarding human papillomavirus vaccination: A qualitative systematic review. Acad Pediatr 2018;18:S53-65.
8. Sanaullah M, Bashir S, Bhatti J, Pardhan A, Kataria A. Promotion of HPV vaccination: Potential gaps between knowledge and practices of Pakistani female family practitioners. J Fam Plann Reprod Health Care 2012;38:208-9.
9. Daley MF, Crane LA, Markowitz LE, Black SR, Beaty BL, Barrow J, *et al.* Human papillomavirus vaccination practices: A survey of US physicians 18 months after licensure. J Pediatrics 2010;126:425-33.
10. Duval B, Gilca V, McNeil S, Dobson S, Money D, Gemmill IM, *et al.* Vaccination against human papillomavirus: A baseline survey of Canadian clinicians' knowledge, attitudes and beliefs. J Vaccine 2007;25:7841–7.
11. Khalid H. Knowledge, attitudes, and practices regarding cervical cancer screening among physicians in the western region of Saudi Arabia. Saudi Med J 2011;32:1155-60.
12. Canon C, Effoe V, Shetty V, Shetty A. Knowledge and attitudes towards human papillomavirus (HPV) among academic and community physicians in Mangalore, India. J Cancer Educ 2017;32:382–91.
13. Ali SF, Ayub S, Manzoor NF, Azim S, Afif M, Akhtar N, *et al.* Knowledge and awareness about cervical cancer and its prevention amongst interns and nursing staff in tertiary care hospitals in Karachi, Pakistan. PLoS One 2010;5:e11059.
14. World Health Organization. Human papillomavirus vaccines: WHO position paper. Wkly Epidemiol Rec 2009;84:118-31.
15. Sohail R, Habib M, Khurshid N. Awareness and knowledge of human papillomavirus and its vaccine amongst doctors of tertiary care hospital. J Soc Obstet Gynaecol Pak 2018;8:110-4.
16. Sypień P, Marek W, Zielonka TM. Awareness and attitude of polish gynecologists and general practitioners towards human papillomavirus vaccinations. Healthcare 2023;11:1076.
17. Almazrou S, Saddik B, Jradi H. Knowledge, attitudes, and practices of Saudi physicians regarding cervical cancer and the human papilloma virus vaccine. J Infect Public Health 2020;13:584-90.
18. Collange F, Fressard L, Pulcini C, Sebbah R, Peretti-Watel P, Verger P. General practitioners' attitudes and behaviors toward HPV vaccination: A French national survey. Vaccine 2016;34:762-8.
19. Katsuta T, Moser CA, Offit PA, Feemster KA. Japanese physicians' attitudes and intentions regarding human papillomavirus vaccine compared with other adolescent vaccines. Papillomavirus Res 2019;7:193-200.
20. Albayat SS, Mundodan JM, Elmardi K, Hasnain S, Khogali H, Baaboura R, *et al.* Knowledge, attitude, and practices regarding human papilloma virus vaccination among physicians in Qatar. Women's Health 2024;20:17455057241227360.