HUMAN PAPILLOMAVIRUS AND ITS VACCINE: AWARENESS AND ATTITUDES OF YOUNG FEMALE PAKISTANI STUDENTS

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ABSTRACT

OBJECTIVE: To determine awareness about human papillomavirus (HPV) among female students of medical field in Pakistan.

METHODS: A researcher administered, descriptive cross-sectional survey was conducted on a voluntary group of participants (n=629) belonging to medical field from August 2017 to December 2017. After taking permission from the administration random convenient sampling method was adopted. This survey included only female students who were currently studying in departments of medical/health sciences. Students of first and second professionals were excluded because they are beginners in medical fields.

RESULTS: The main source of information regarding HPV was academic curriculum (38.25%) of the respondents, with only 21.70% claiming that healthcare providers had educated them about the same. However, 70.11% also reported that HPV/Pap test had never been recommended by their doctors. Many participants 36.09% had no prior knowledge of HPV vaccines; while 56.28% were willing to get vaccinated, the remaining 23.21% claimed a variety of reasons for their unwillingness and rest were uncertain. The top three reasons cited for unwillingness were being sexually inactive 54.79%, the reason of not knowing anything about vaccine 6.84% and cost of vaccines 6.84%.

CONCLUSION: This study established that despite having knowledge about HPV, the populace required sufficient information about HPV vaccination for its acceptance and to prevent and combat the disease.

KEY WORDS: Vaccination (MeSH); Papillomavirus Infections (MeSH); Papillomavirus Vaccines (MeSH); Uterine Cervical Neoplasms (MeSH); Human Papillomavirus (Non-MeSH); Awareness (MeSH); Students, Medical (MeSH); Students, Health Occupations (MeSH).

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INTRODUCTION

Human papillomavirus (HPV) is a widespread sexually transmitted DNA virus that infects only the epithelial cells of the host.[1] After entering the epithelial layer, viral gene expression begins in order to assemble infectious HPV virions in final stages of the infection.[2] There are over one hundred subtypes of HPV that are classified as low-risk and high-risk depending on their probability for causing oncogenesis.[1,2] HPV may manifest itself as genital warts in both men and women, cervical dysplasia, cervical or oropharyngeal cancers in some cases.[3] However, most men and women infected with HPV do not show clinical symptoms of the disease and are resolved by the host's immune response within 2 years.[3] Moreover, the progression from infection to malignancy can exceed 10 years. Therefore, cervical cancer is highest in women aged over 40 years.[1]

Many factors may cause cervical cancer, such as number of sexual partners, age at first sexual intercourse, and sexual behavior of the male partner.[3] However, genital infection with specific types of HPV is the most important risk factor. Of the many subtypes of HPV subtypes 16, 18, 31, and 33 are confirmed to be cancerous. These 'high-risk' subtypes have been discovered in nearly all cervical cancers.[4]

The Age Standardized Risk (ASR) per 100,000 women in Pakistan is 7.5, which is lower than worldwide (ASR of 15.2 per 100,000 women).[5] At any given time, nearly 0.5% of Pakistani women harbor cervical HPV 16/18 infection and 88.1% invasive cervical cancers are attributable to HPV 16 or 18.[6] Globally, prevalence of cervical HPV is the highest in Sub-Saharan Africa (24%), Eastern Europe (21.4%) and in Latin America (16%).[7]

Pakistan has 59.04 million women of the age 15 years and above that are at risk of cervical cancer. According to latest estimates, 5,233 women are diagnosed with cervical cancer and 2,876 die from the disease annually.[6] It is the third most frequently occurring cancer among women in Pakistan and the second most common cancer among women aged 15-44 years.[6] The picture is just as bleak when global figures are considered. Annually, over 470,000 new cases are reported and about 230,000 deaths are caused; nearly 80% occurring in developing nations.[4]

Cervical cancer is most likely to affect females that are poor, have lower education, and lower income. Differences in stage when diagnosed and mortality based on ethnicity have also been reported in literature.[8] This disparity may be explained by the higher screening rates and wider acceptance of Papanicolau (Pap) test in developed countries and availability of FDA approved HPV vaccines Cervarix® (a bivalent vaccine) and Gardasil® (the quadrivalent vaccine)[8] that confer protection against HPV 16 and 18.[1]

TABLE I: LEVEL OF KNOWLEDGE OF STUDY PARTICIPANTS ABOUT HUMAN PAPILLOMAVIRUS AND CERVICAL CANCER

Question	Response	Frequency (n)	Percentage (%)
Are you aware of HPV?	Yes	455	72.33
	No	174	27.67
What is the source of your knowledge regarding HPV?	Family/friend	11	2.38
	Newspaper	6	1.43
	TV	12	2.70
	Healthcare provider	99	21.70
	Internet	61	13.35
	Academics	174	38.25
	Don't remember	92	20.19
Is HPV infection rare?	Yes	285	45.31
	No	217	34.49
	Don't know	127	20.20
Which gender does HPV infect?	Men	2	0.32
	Women	150	23.84
	Both	467	74.25
	Don't know	10	1.59
Is HPV sexually transmitted?	Yes	150	23.84
	No	295	46.90
	Don't know	184	29.26
Is incidence of HPV highest in women in their 20s and 30s?	Yes	258	41.01
	No	39	6.21
	Don't know	332	52.78
Can HPV cause cervical cancer?	Yes	379	60.26
	No	61	9.69
	Don't know	189	30.05
Can HPV cause genital warts?	Yes	333	52.95
	No	29	4.61
	Don't know	267	42.44
Can both men and women get cervical cancer?	Yes	60	9.54
	No	315	50.07
	Don't know	254	40.39
Is Pap smear a screening test for cervical cancer?	Yes	281	44.67
	No	116	18.44
	Don't know	232	36.89
Did your doctor ever mention/recommend HPV/Pap test?	Yes	98	15.59
	No	441	70.11
	Don't know	90	14.3
Are genital warts and cervical cancer caused by the same subtype of HPV?	Yes	333	52.95
	No	29	4.61
	Don't know	267	42.44
Is HPV infection curable?	Yes	344	54.69
	No	57	9.07
	Don't know	228	36.24
Can HPV infection resolve itself without treatment?	Yes	45	7.16
	No	410	65.18
	Don't know	174	27.66

HPV=human papillomavirus

The vaccines have the potential to reach high risk groups identified by various researchers[9-11] and thus reduce future health burden. Medeiros, et al.[12] reported that prophylactic administration of the vaccines can prevent HPV infection in women aged 9-26 years, provided they had not been infected with the subtypes covered by the vaccines before. The efficacy of these vaccines in men is unproven and its use for men is currently not licensed. Three doses of the vaccines are administered at intervals of 0, 1 and 6 months for Cervarix® and 0, 2 and 6 months for Gardasil® as intramuscular injections.[1]

Despite proven usefulness of the vaccines, early reports indicate lower vaccination rates among at-risk groups.[13,14] Graham and Mishra have identified high cost of the vaccines and absence of a usual care-source, as well as lack of public awareness about cervical cancer and available screening methods as hindrances to the use of these vaccines.[11] The highest vaccine coverage in countries like Scotland and Spain etc. was achieved through school-based vaccination programs[15,16] and the most prominent finding was in Uganda, attaining almost 95% coverage.[17]

Average monthly income in Pakistan ranged from PKR 21,785-37,727 in 2010-2011 according to a report by the Pakistan Bureau of Statistics.[18] Consequently, the high retail prices of the vaccines (Cervarix®: Rs. 4700, Gardasil®: Rs. 9000)[19] render them out of the financial reach of most people. Khan S, et al[2] claim that the epidemiology of HPV in Pakistan is still unclear due to social and cultural taboos on matters related to sex. Thus, there is a dearth of quantifiable data regarding HPV burden and HPV-related cervical cancer cases is the country. Nonetheless, HPV-16 has been found in nearly every case of cervical cancer in Pakistan[2]. It is thus imperative that immunization of the at-risk group be carried out. However, a significant barrier to acceptability of the vaccines, apart from the factors mentioned earlier is the lack of awareness of the general population[8].

The present study aims to of awareness about human papillomavirus (HPV) among female students enrolled in different medical-related fields of study in Karachi, Pakistan. Moreover; the designed questionnaire was also utilized to explore their perceptions and the necessity/usefulness of the HPV vaccination as well. This would help to organize ways for promotion of knowledge about HPV vaccination and its acceptance for prevention and eradication of the disease associated to the virus.

METHODS

A descriptive cross sectional study was conducted using random, convenience sampling method among female medical

TABLE II: KNOWLEDGE OF STUDY PARTICIPANTS ABOUT HUMAN PAPILLOMAVIRUS VACCINES

Question	Response	Frequency (n)	Percentage (%)
Have you any prior awareness of HPV vaccines?	Yes	222	35.30
	No	227	36.09
	Don't know	180	28.61
To whom can vaccine be administered?	Men	5	0.79
	Women	311	49.45
	Both	313	49.76
Age group for whom vaccination be recommended?	9-26 years	493	78.38
	27-30 years	103	16.38
	31-40 years	33	5.24
Do the current HPV vaccines protect against genital warts and cervical cancer?	Yes	315	50.08
	No	30	4.77
	Don't know	284	45.15
Is HPV vaccine approved for individuals who have never been infected with HPV?	Yes	286	45.47
	No	86	13.68
	Don't know	257	40.85

HPV=human papillomavirus

students of various universities. A self administered proforma was used designed from various sources and was used after taking consent from respondents. Anonymity and confidentiality of the participants were maintained. The research was conducted from Aug. 2017 to Dec. 2017. Permission to conduct survey based study was taken from the administration of the institutes. This survey included only female students who were currently studying in departments of medical/health sciences. Students of first and second professionals were excluded as they were supposed to be beginners in medical fields.

A self-administered questionnaire was prepared to check the awareness regarding cervical cancer and HPV vaccination related issues among the future healthcare providers. The questionnaire was primarily closed ended while a few open-ended questions which were divided into three sections. The first part consisted of basic information of participants and their awareness regarding cervical cancer and HPV. The second section provided knowledge based questions on cervical cancer, efficacy and safety of the HPV vaccine. The third section had questions regarding acceptance and perception of HPV vaccination, to gauge the baseline understanding of the disease and concept of vaccination. It took about 30 minutes to complete the questionnaire.

Data were checked for completeness and then entered into SPSS 21.0 for analysis. The results were summarized using descriptive statistics, expressed as mean and percentages.

RESULTS

A total of 629 female students related to medical fields participated in the study. The demographic information about the respondents is represented in Figure I.

Level of knowledge about HPV and cervical cancer among the participants is displayed in Table I. It was seen that 72.33% (455) respondents knew about HPV in which 38.25% (174) knew through their study curriculum and 21.70% (99) because of other healthcare providers. Most participants possessed basic knowledge of the virus and cervical cancer, as the students had a medical background. Majority 70.11% (441) responded that their doctors never mentioned or recommended screening Pap test for them.

The knowledge about HPV vaccines among respondents is shown in Table II. It was observed that overall approximately less than 50% participants were not sure of the correct answers, reflecting the need for widely disseminating information regarding the vaccine to ease cervical cancer burden.

Health status and attitude of the participants about HPV vaccination is exhibited in Table III. About 36.54% (230) of the participants believed their health status was average and only 27.82% (175) visited a doctor regularly; just a very few 0.48% (3) had a history of tumor/cancer. It was also seen that 56.28% (354) were willing to get vaccinated and 67.89% (427) were also willing to recommend the vaccine to others.

The vaccination history of the participants is shown in Figure II, which shows that majority 73% (459) never received HPV vaccination and among those who had 5% (31) did not get all three doses of the vaccine.

DISCUSSION

The study established that the students 72.33% were aware of HPV and cervical cancer (Table I) and the main source of information was their academic curriculum. However, the participants (approximately less than 50 %) did not have sufficient basic knowledge about the vaccines (Table II). Sufficient knowledge about HPV was also reported by an Indian study, where academics was cited as major source of information.[20] Similar studies conducted in South Africa and Botswana showed HPV awareness as 26.2% and 35% respectively.[21,22] A research in India, Nepal and Sri Lanka found that on average 66% Indians, 58.8% Nepalis and 57.7% Sri Lankans were aware of cervical cancer and its etiology.[23]

Regarding HPV vaccination, 56.28% respondents were willing to be vaccinated (Table III). Numerous researchers have also documented the link between awareness of HPV and cervical cancer and the acceptability of HPV vaccines.[8,24] From our study it was observed that 67.89% of participants were willing to recommend HPV vaccine to others. There were some countries, notably Malaysia, Kenya and Tanzania, where despite of lower level of education about HPV and cervical cancer, high levels of acceptance of the vaccines were demonstrated. The study also found that healthcare provider or clinician recommendation is also important in increasing vaccine acceptability.[24]

In our study, 54.79% of the participants being sexually inactive were unwilling to get vaccinated and almost the same finding is established in another research as well that the vaccines are

TABLE III: HEALTH STATUS AND ATTITUDES REGARDING HUMAN PAPILLOMAVIRUS VACCINATION OF RESPONDENTS'

Question	Response	Frequency (n)	Percentage (%)
Self-perception of health status	Excellent	89	14.14
	Very good	168	26.75
	Fair	230	36.54
	Poor	142	22.57
Regular visit to doctor	Yes	175	27.82
	No	454	72.18
History of cervical tumor/cancer	Yes	3	0.48
	No	617	98.09
	Don't know	9	1.43
Willing to get vaccinated?	Yes	354	56.28
	No	146	23.21
	Undecided	129	20.51
If not willing, then the reason for unwillingness?	I believe I do not need it	10	6.84
	I am not sexually active	80	54.79
	It is too expensive	10	6.84
	I am too old for vaccine	05	3.42
	Doctor did not recommend it	06	4.10
	Worried about safety of vaccine	06	4.17
	Do not know where to get vaccine	04	2.73
	My spouse/family is against it	0	0
	I do not know enough about vaccine	10	6.84
	I already have HPV	0	0
	Don't know	15	10.27
Would you recommend vaccine to others?	Yes	427	67.89
	No	71	11.28
	Don't know	131	20.82
If vaccine is provided free of cost, would you accept it?	Yes	379	60.26
	No	102	16.22
	Don't know	148	23.52
Do vaccinated women no longer need annual cervical cancer screening test?	Yes	98	15.58
	No	265	42.14
	Don't know	266	42.28

HPV=human papillomavirus

intended to prevent the occurrence of a sexually transmitted virus and are administered to young girls before they make their sexual debut.[24] McCafferey K, et al.[25] in 2003 reported that among Indian, Pakistani, African-Caribbean and white British women in the UK getting tested for HPV provoked negative feelings in them, and in their point of view sent messages of promiscuity, mistrust, and unconventionality. Especially in Pakistani and Indian women where monogamy is the rule, getting vaccinated for HPV may hold significant negative social connotations.[25]

In our study 36.54% participants believed their health status was average; just a very few of 0.48% had a history of tumor/cancer (Table II). The vaccination history of the participants shows that majority 73% never received HPV vaccination and among those who had 5%, did not get all three doses of the vaccine. Khan S, et al.[2] in 2007 studied the serotype HPV16 in 59 out of 60 cervical cancer patients at Pakistan which suggests that HPV vaccination is of particular importance in this country but social and cultural taboos regarding sex and sexual health complicate attempts to impart information about HPV, cervical cancer and the HPV vaccines. Due to strong religious and social restrictions, incidence of cervical cancer is much lower in Pakistan than elsewhere in the world. However as Jawaid A claims, norms are changing and the scenario may change drastically in a couple of decades.[26]

From our study (Table III) it was noted that if the vaccines were provided free of cost then their acceptance would increase from 56.28% to 60.26% among the study participants. This is corroborated by other researchers[8,27] including Bhatla and Joseph (2009) who found that cost, lack of awareness, infrastructure, the side effects, social and religious concerns were some of the barriers to widespread acceptance of HPV vaccination in India.[28]

CONCLUSION

It was found that the participants had sufficient knowledge about HPV disease as they belonged to medical background, however the lack of information about HPV vaccination, should be addressed as the respondents are future healthcare providers and also acceptance of vaccination is necessary for prevention of this disease.

LIMITATIONS AND RECOMMENDATIONS

Present study was limited, covering only the medical students of Karachi. It was recommended that in future such investigation would be conducted on various cities of Pakistan and also compares the responses of rural and urban areas of the of Pakistan.

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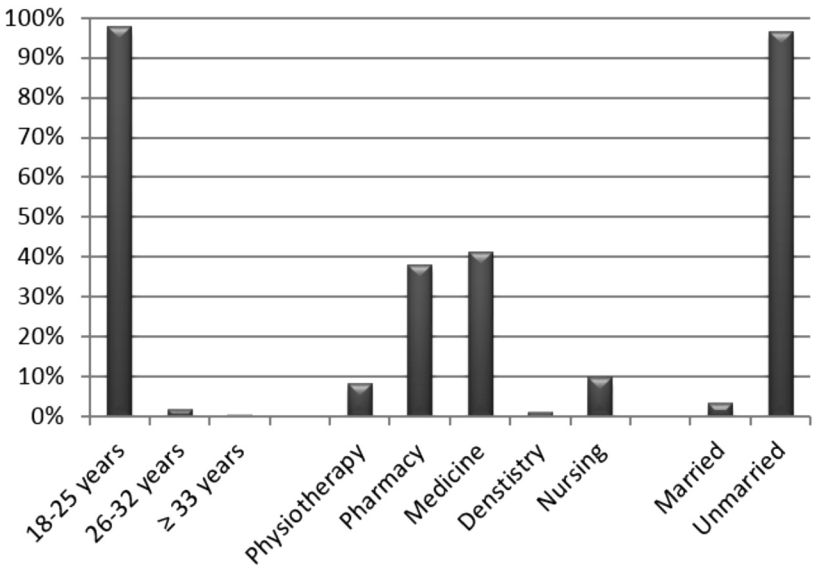

Figure 1: Information about respondents

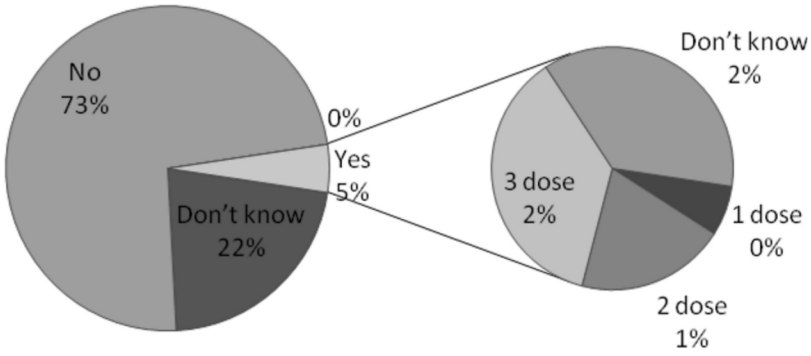

Figure 2: Vaccination history of participants

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AUTHORS' CONTRIBUTIONS

Following authors have made substantial contributions to the manuscript as under:

SG: Concept, interpretation of data, critical review, final approval of the version to be published.

FA: Acquisition of data, drafting the manuscript, critical review, final approval of the version to be published.

TH: Study design, drafting the manuscript, final approval of the version to be published.

LB: Acquisition of data, critical review, final approval of the version to be published.

SN: Acquisition, analysis & interpretation of data, drafting of manuscript, final approval of the version to be published.

MAM: Acquisition, analysis & interpretation of data, final approval of the version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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