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Awareness, attitudes and perceptions about HPV and anti-HPV vaccine among women living in Taif, Saudi Arabia

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Abstract--There has been a recent surge in the number of cases of Human papillomavirus (HPV) infections in Saudi Arabia, despite the country's reputation for conservatism and lower incidence of other sexually transmitted diseases.. The study aimed to assess the

awareness and knowledge of HPV and acceptability HPV vaccination among the female population in the Taif region. A survey was conducted among females aged 18-58 years who were residents of Taif city. A pretested questionnaire was used that included sociodemographic details and items that recorded awareness, knowledge, attitude, and perceptions related to HPV and anti-HPV vaccination. A mixture of convenience and snowball sampling techniques was used to collect responses. About 47.1% had awareness regarding HPV and only 14.8% knew that HPV is a common infection in Saudi Arabia. However, 78.2% knew that unsafe sexual relations could increase the risk of infection with HPV. But only 15.8% believed that there is a treatment for HPV infection. The knowledge related to HPV was found to be poor among 58.5%, and only 10.9% demonstrated poor knowledge. Campaigns to educate people of all ages about human papillomavirus to remain essential for increasing HPV vaccination rates, particularly among women of reproductive age.

Keywords--human papillomavirus, infection, sexual behavior, awareness, vaccine.

Introduction

Human papillomavirus (HPV) is one of the most common sexually transmitted diseases (STDs) and is a major cause of cervical cancer. High-risk oncogenic HPV infection is associated with virtually all cases of cervical cancer [1]. Cervical cancer is one of the life-threatening public diseases affecting the female population worldwide. According to the ICO/IARC Information Centre on HPV and Cancer report, cervical cancer is the eighth most common malignancy and the third most gynecological malignancy among Saudi Arabian women [2]. The incidence of cervical cancer is shockingly high in low- and middle-income nations despite the fact that it is one of the few human malignancies that can be prevented [3]. The advent of vaccination against this illness over the previous decade has been marked, with over 80 nations including the HPV vaccine in their national immunization program [4]. National immunization programs in several nations have focused on preteen girls because of the high rate at which they contract HPV from their first sexual intercourse [5,6]. However, the targeted age groups differ from nation to nation [6].

Early prevention by HPV vaccination and routine Pap smear screening revealed significant roles in the reduction of cervical cancer cases. The opportunity to prevent cervical cancer by immunization is both valuable and difficult. Knowing what factors will determine how well the HPV vaccination is received is a necessary first step toward developing effective measures to promote vaccine uptake. Understanding the acceptability factors and awareness of the HPV vaccine among the general population is a key move to building up a plan aiming to increase the uptake of the HPV vaccine. The acceptance of vaccines can be affected by the awareness level of the population. Multiple studies have shown that young people's familiarity with and openness to the HPV vaccine vary widely

between countries. Given that anti-HPV vaccines provide the first line of defense against HPV, vaccinations are a promising tool for reducing cervical cancer incidence and, consequently, minimizing mortality from the disease [7].

All three currently available vaccines are virus-like particle (VLPs) subunit vaccines. When given to young adolescents before they become sexually active, these vaccines are extremely effective [8]. Many studies have shown that young people in different nations have widely varying degrees of knowledge about, attitudes towards, and willingness to receive the HPV vaccine. In Saudi Arabia, The amount of information available on these topics is minimal. A study done by Hussain et al. in 2016 in Riyadh reported that only 34.5% of the 325 participants in the survey knew about HPV infection, and 24.5% knew about its association with cervical cancer [9]. The same study also highlighted the poor awareness of HPV vaccines. However, this study was carried out before the inclusion of HPV vaccines in the national immunization schedule. Thus our study aimed to better investigate awareness, attitude, and practices towards HPV and anti-HPV vaccination by carrying out a survey exclusively of female participants all over Saudi Arabia.

Materials and Methods

A cross-sectional survey was conducted among the female population in the Taif province, Saudi Arabian. A pre-tested questionnaire was used to collect responses through social media platforms. Females aged 18-58 years (reproductive age) who gave consent to participate were only included in our study. All the males and females aged less than 18 and above 58 years were excluded from the analysis. We used a mixture of convenience and snowball sampling techniques to collect the responses. The data collection was carried out for a period of one month (June 17th - July 17th, 2022). Ethical approval and consent were taken from the Research and Ethics Committee of Taif University. The questionnaire consisted of four sections. The first section had items that checked for study eligibility criteria, and participants who didn't fulfill the criteria were asked to submit the survey without proceeding to the next sections. The second included sociodemographic items, and the third part had items that recorded awareness and knowledge related to HPV and HPV vaccines. The final part had items that recorded participants' perceptions related to HPV vaccine effectiveness and side effects.

Statistical Analysis and Data Management

The data was downloaded from the survey data using into a Microsoft Excel spreadsheet and then uploaded to IBM's Statistical Package for the Social Sciences, Version 23 (SPSS Inc., Chicago, IL, USA) for further analysis. Descriptive statistics in the form of frequencies and percentages utilizing relevant tables and figures to describe categorical data. Pearson's chi-square test relationship between categorical variables A p-value <0.05 will be regarded statistically significant.

Results

We included responses from 701 participants who satisfied the study inclusion criteria. The socio-demographic analysis showed that 347 (49.5%) women belonged to the age group of 15-25 years, 382 (54.5%) were single (unmarried), and among those who were married, divorced, or widowed, about 146 (45.8%) had more than three children. About 472 (67.3%) participants had bachelor's degree, and 429 (61.2%) were unemployed [Table 1].

Table 1 Sociodemographic details of the participating woman			
		N	%
Age (years)	15-25	347	49.5
	26-36	113	16.1
	37-47	153	21.8
	48-58	88	12.6
Marital status	Single	382	54.5
	Married	288	41.1
	Divorced	19	2.7
	Widowed	12	1.7
Number of children (n=319)	0	38	11.9
	1	33	10.3
	2	50	15.7
	3	52	16.3
	>3	146	45.8
Educational qualification	Elementary/ Intermediate	33	4.7
	Secondary	131	18.7
	Diploma	36	5.1
	Bachelor degree	472	67.3
	Master's/PhD	22	3.1
	Uneducated	7	1.0
Employment	Educational sector	205	29.2
	Health sector	33	4.7
	Military Sector	3	.4
	Other field	31	4.4
	Unemployed	429	61.2

It was reported by 330 (47.1%) participants that they had heard about HPV before, and thus we assessed the knowledge level only among the participants who had an awareness of this virus [Table 2]. Internet/ Social Media/ TV was the commonly cited source of information (50.3%) about HPV [Figure 2].

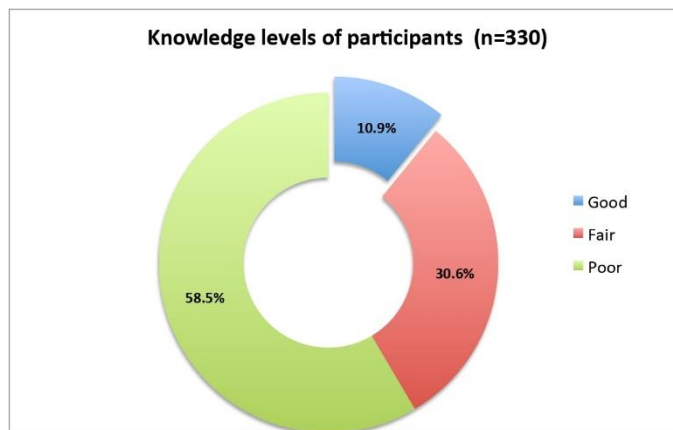


Figure 1. Knowledge levels of the participants

About 70% knew that HPV is a disease seen in the genital area and transmitted through sexual contact. Only 14.8% knew that HPV is common in Saudi Arabia, and more than half of the participants, 56.7%, knew that both genders got infected with the virus. The majority of the participants (78.2%) knew that unsafe sexual relations could increase the risk of infection with HPV, but only 30% knew that most people with HPV infections do not have any symptoms. However, we observed that only 15.8% knew that there was no treatment for the virus itself. About 42.1% knew that Smoking increases the persistence of the virus and leads to a cancerous change in the cells infected with the virus and 60.6% agreed that HPV causes genital warts. Approximately 70% believed that if the virus continues to be active, this leads to the appearance of abnormal and cancerous cells in the Pap smear, and half of the participants (50%) knew that HPV might cause cancers of other reproductive organs. The majority of the participants agreed that Prevention against HPV would prevent cervical cancer.

Table 2 Participants' responses to knowledge items related to HPV (n=330)			
	False	True	I don't know
HPV is a disease seen in the genital area and transmitted through sexual contact.	47 (14.2%)	231 (70.0%)*	52 (15.8%)
HPV is common in Saudi Arabia	98 (29.7%)	49 (14.8%)*	183 (55.5%)
Both men and women get infected with HPV	67 (20.3%)	187 (56.7%)*	76 (23.0%)
Unsafe sexual relations can increase the risk of infection with HPV	16 (4.8%)	258 (78.2%)*	56 (17.0%)
Most people with HPV infections do not have any symptoms.	84 (25.5%)	99 (30.0%)*	147 (44.5%)
There is no treatment for HPV infection.	127 (38.5%)	52 (15.8%)*	151 (45.8%)
Smoking increases the persistence of the virus and leads to a cancerous change in the cells infected with the virus	15 (4.5%)	139 (42.1%)*	176 (53.3%)

HPV Causes Genital Warts	13 (3.9%)	200 (60.6%)*	117 (35.5%)
If the virus continues to be active, this leads to the appearance of abnormal and cancerous cells in the Pap smear?	3 (0.9%)	229 (69.4%)*	98 (29.7%)
HPV may cause cancers of other reproductive organs (anus and penis).	17 (5.2%)	165 (50.0%)*	148 (44.8%)
1Prevention against HPV will prevent cervical cancer.	10 (3.0%)	230 (69.7%)*	90 (27.3%)

*correct answers

We calculated the total knowledge level regarding HPV by assessing the correct responses (score =1) and wrong responses (score =0) for each knowledge item in the questionnaire, which was calculated by adding all the scores for 11 items and then converting these scores into percentages. Those who scored $\geq 75\%$ were assumed to have a 'good' knowledge level, and those who scored 60-74.9% and $<60\%$ had fair and poor knowledge levels, respectively. The analysis showed that only 36 (10.9%) had shown a 'good' knowledge level, whereas more than half (58.5%) had demonstrated 'poor' knowledge regarding HPV [Figure 2]. We assessed the relationship of knowledge level with the sociodemographics of the participants [Table 3]. The knowledge level didn't show any statistically significant association with the age of the participants ($p=0.896$), marital status ($p=0.674$), and educational level ($p=0.322$). It was observed that participants who belonged to the educational field and health sector demonstrated significantly 'good' knowledge levels, and poor knowledge was seen among participants those who were unemployed ($P=0.027$).

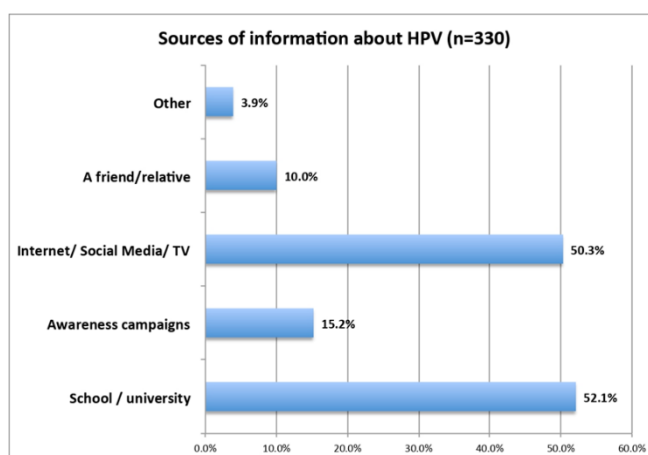


Figure 2. Source of awareness abo

Table 3
Relationship between knowledge level and participants demographics (n=330)

		Knowledge level			P value*
		Good	Fair	Poor	
Age (years)	15-25	15 (8.9%)	53 (31.5%)	100 (59.5%)	0.896
	26-36	6 (11.3%)	18 (34.0%)	29 (54.7%)	

	37-47	10 (14.1%)	20 (28.2%)	41 (57.7%)	
	48-58	5 (13.2%)	10 (26.3%)	23 (60.5%)	
Marital status	Single	18 (9.9%)	60 (33.1%)	103 (56.9%)	0.674
	Married	15 (11.3%)	35 (26.3%)	83 (62.4%)	
	Divorced	2 (16.7%)	5 (41.7%)	5 (41.7%)	
	Widowed	1 (25.0%)	1 (25.0%)	2 (50.0%)	
Education level	No primary education	1 (33.3%)	0 (0.0%)	2 (66.7%)	0.322
	Elementary/Intermediate	1 (6.3%)	2 (12.5%)	13 (81.3%)	
	Secondary	5 (11.9%)	12 (28.6%)	25 (59.5%)	
	Diploma	0 (0.0%)	5 (33.3%)	10 (66.7%)	
	Bachelors	26 (10.9%)	80 (33.5%)	133 (55.6%)	
	Master's/PhD	3 (20.0%)	2 (13.3%)	10 (66.7%)	
Occupation	Educational Sector	16 (15.1%)	27 (25.5%)	63 (59.4%)	0.027
	Health Sector	4 (14.8%)	14 (51.9%)	9 (33.3%)	
	Military Sector	1 (50.0%)	0 (0.0%)	1 (50.0%)	
	Other Sector	0 (0.0%)	1 (14.3%)	6 (85.7%)	
	Unemployed	15 (8.0%)	59 (31.4%)	114 (60.6%)	

*p value<0.05 is considered statistically significant

When we assessed the participants' perception of the HPV vaccine, more than half of the participants (56.1%) believed that it was safe, and a majority (87.4%) needed assurance that the vaccine would protect against HPV. About 62.3% were worried about the long-term side effects of the vaccine, and vaccine side effects were the biggest concerns (65.5%). More than half of the participants (65.5%) believed that the HPV vaccine should be taken by all genders, whereas 23.7% believed that only women should take it. The majority of the participants (66.6%) didn't know about the number of doses that needed to be taken in order to get prevention against HPV. About 36.4% believed that the decision to take a vaccine should be a joint decision between the person and the family or parents, whereas 39.1% believed that it should be decided by that person himself or herself. The majority of the participants (95.6%) agreed that they would take the HPV vaccine if recommended [Table 4].

Table 4
Perceptions related to vaccine efficacy and safety (n= 701)

		N	%
Do you think the vaccine is safe?	No	52	7.4
	Yes	393	56.1
	I don't know	256	36.5
Do you want to be assured that the vaccine will protect against HPV?	No	24	3.4
	Yes	613	87.4
	I don't know	64	9.1
Are you worried about short-term side effects?	No	162	23.1
	Yes	437	62.3
	I don't know	102	14.6
Are you concerned about the long-term side effects?	No	115	16.4
	Yes	490	69.9
	I don't know	96	13.7

What are your biggest concerns about the HPV vaccine?	No concerns or fears	151	21.5
	Vaccine cost	12	1.7
	Vaccine efficacy	79	11.3
	Vaccine side effects	459	65.5
Which group should be vaccinated?	All genders	393	56.1
	Doctor	12	1.7
	Female	166	23.7
	I don't know	130	18.5
When do you think the vaccine should be given	Any age	143	20.4
	Before marriage	179	25.5
	Preschool	54	7.7
	School age	149	21.3
	I don't know	176	25.1
How many doses of HPV vaccine should be taken to get immunity against the virus	1 dose	114	16.3
	2 doses	72	10.3
	3 doses	48	6.8
	I don't know	467	66.6
Who should make the decision to administer the vaccine?	A joint decision between the person concerned and his parents	255	36.4
	Parents only	31	4.4
	The person concerned himself	274	39.1
	I don't know	141	20.1
If he recommended vaccination, would you agree to take it?	No	31	4.4
	Yes	670	95.6

The participants' attitudes towards HPV prevention are depicted in Figure 3. It was observed that 85.2% of the participants were ready to give information to adolescents about HPV infection and its health consequence, and about 87.1% were ready to give information to adolescents about HPV prevention. The majority of the participants (88.3%) were ready to give to educate the community about prevention methods, including vaccination, as part of the reproductive health education program. However, we observed that only 22.3% strongly agreed to take HPV vaccines if recommended, and about 8.2% were not ready to take them.

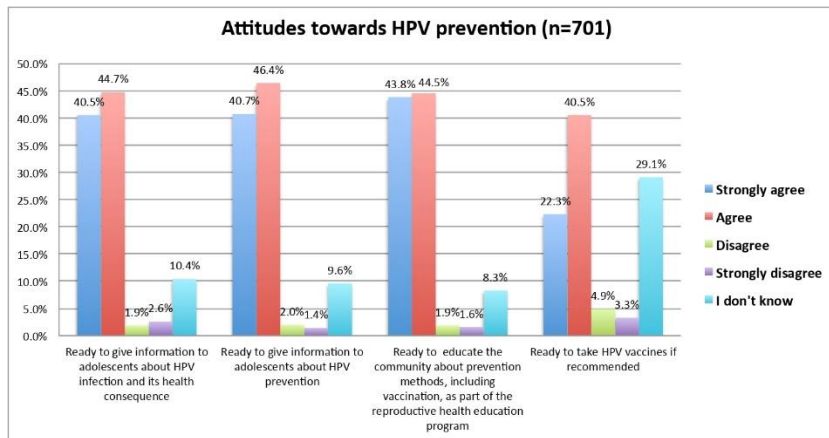


Figure 3. Attitude towards HPV prevention

Discussion

The current findings study showed that only less than half of the women had awareness about HPV, and the knowledge level was found to be good only in a very small percentage (10.9%) of this population. This finding was unexpected in the context of current public awareness campaigns about the HPV virus and the inclusion of the HPV vaccine in the national immunization schedule. In Saudi Arabia, the HPV vaccine is given to females of age 9 to 13 years as part of the country's national immunization program [9,10]. Only a few percent of women knew that HPV infection was common in Saudi Arabia. Despite the lack of a nationwide screening program in Saudi Arabia, a prevalence that ranges between 28-35% has been reported in many regional studies [11-14]. A similar study done in the United Arab Emirates (UAE) reported that only 29% of women have heard of HPV infection, whereas a significant percentage of them believed that it could cause cervical cancer [15]. In our study, 69.7% of the women who were aware of HPV believed that prevention against this virus would prevent cervical cancer. A recent study done in Madinah province, Saudi Arabia, among females reported that only one-third of the participants knew that HPV is a risk factor for cervical cancer development. The study findings also showed that less than half (44%) could correctly identify a pap smear as a screening tool, and only 12.6% knew the existence of the HPV vaccine [16]. The awareness regarding HPV and HPV vaccine in our study is consistent with findings from other gulf countries such as Oman, Kuwait, and UAE [17-19]. A similar lack of awareness regarding HPV and cervical cancer has been reported in other provinces of Saudi Arabia [20,21].

Despite their relatively inadequate awareness of HPV and its vaccine, nearly half of the participants indicated their willingness to receive the HPV vaccine. Although cervical cancer burden and mortality have been shown to be reduced by HPV vaccination alone or in combination with screening in a number of settings, basic knowledge about the cause of cervical cancer is still lacking in some populations, such as Saudi Arabian women, where myths about cervical cancer and HPV are widespread [9]. Most likely, cultural and/or educational differences contribute to these misconceptions [22,23]. This health issue is further complicated by the conservative culture in Saudi Arabia, where the majority are

uncomfortable discussing their sexual lives openly or believe that HPV risk factors or behaviors do not apply to them. As a result, the scope of the problem is likely greater than what has been shown in the few local studies.

More than half of the women in our survey reported they would take the HPV vaccination if offered, and the majority said they would recommend it to their family and friends, which is similar to findings from other studies [24-26]. We found that our cross-sectional data, which included females from Taif Province, are consistent with previously published research works and highlight shared aspects [27-29]. Saudi women's knowledge of HPV and its clinical consequences is low. This lack of knowledge about the HPV vaccine and its importance and availability is equally surprising. It is not uncommon for Saudi women to rely on the internet as their primary source of information, which can be incorrect and provide misleading information that may postpone or discourage immunization. Primary healthcare facilities and private practices, as well as government agencies, play an essential role in raising awareness of cervical cancer screening procedures and increasing the number of women who have access to them. Recently, many countries, including the United States, have launched awareness programs aimed at increasing awareness of cervical cancer prevention and encouraging women to accept novel screening methods that include HPV diagnostics and proliferation and detection of epigenetic changes [30-32].

The study's limitations include the difficulty in assessing the true response rate because the survey was sent online. Thus the potential for selection bias due to the online aspect of the survey and the likelihood of careless responses. As a result, it's possible that a portion of the intended audience was overlooked. By distributing the survey to Taif province's different districts and using social media, we hoped to overcome this problem. The self-reported nature of the questionnaire could also have resulted in social-desirability bias.

Conclusion

The study found unsatisfactory levels of knowledge among Saudi women regarding HPV and anti-HPV virus. More creative and novel methods of disseminating information about HPV and the HPV vaccination to communities with low awareness should be investigated. When used effectively, social media has enormous potential as a vehicle for disseminating HPV teaching materials and raising HPV awareness. Interventions should prioritize the widespread dissemination of customized, yet comprehensive education on HPV and the HPV vaccine, as well as the countering of HPV- and other health-related internet misinformation.

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