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The awareness, attitude and practice of parents toward Human Papilloma Virus vaccination against HPV infections as a risk factor of cervical cancers in Taif city, Saudi Arabia

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ABSTRACT

Background: HPV infection is closely associated with Cancer Cervix in females. It's the 4th most common cancer after breast, colorectal, and lung cancers in women worldwide. Wherefore (HPV) vaccinations are recommended for routine vaccination at the age of 11 - 12 years for girls as a preventive measure against cervical cancer. *Objective:* Our objective was to evaluate parents' knowledge, attitudes, and practices about the HPV vaccine as a preventative measure against cervical cancer in Taif City, Saudi Arabia. We aimed to reduce the prevalence of cervical cancer among Saudi Arabians. *Methodology:* a Cross-sectional study of convenience sample was done Comprised around 350 parents' male or female participants, from Taif city, Saudi Arabia was conducted between November 2021 and to end of January 2022 by using a web-based questionnaire. It was prepared under the supervision of the supervisor and included the demographic data, awareness of HPV infection and cervical cancer as a risk factor, attitude towards the HPV vaccine against HPV infection and practices the HPV vaccine against HPV infection. *Results:* Our result displayed that only 33.8% of the participants had heard about HPV infection, 26.5 % had heard about the vaccine, and 85% heard about cancer cervix. *Conclusion:* There is a low level of knowledge amongst our participants regarding HPV and the vaccine. Therefore, we need to apply awareness programs among the population about the HPV infection and the importance of taking the vaccine to decrease the prevalence of cancer cervix in our community.

Keywords: Awareness, (HPV), cervical cancer, vaccination, knowledge, Attitude.

1. INTRODUCTION

Cervical cancer is the second most frequent cancer in women around the world. Infection with specific forms of the Human Papillomavirus (HPV) has been linked to more than 99 percent of cervical cancer cases. The HPV vaccine can prevent HPV infection and cervical cancer in the vast majority of instances (Almazrou et al., 2020; Sabr et al., 2021). Because of the causal association amid precancerous gashes and great hazard infection with HPV or cervical cancer, measures to improve screening performance and prevent this cancer have been developed. When compared to cervical cytology, DNA-HPV testing has a higher sensitivity, making it a better primary screening test (Gilham et al., 2019).

The Food and Drug Administration (FDA) of the United States of America approved a first HPV vaccine for the primary prevention of CC in 2006. After then, two more HPV preventative vaccinations were registered. The HPV vaccine is regularly advised for adolescents between the ages of 11 and 12 and can be given as early as 9 years old (Zhou et al., 2020). Prophylactic HPV vaccines – Bivalent vaccine (Cervarix) and Quadrivalent vaccine (Gardasil) – were approved by the Saudi Food and Drug Administration in 2010 for girls aged 11 to 26 years. In the 2019 Saudi National Immunization Schedule, HPV vaccinations were included in the routine vaccine schedules for girls (Farsi et al., 2021). Saudi study reported more than 39% of the study's participants had poor awareness that the HPV vaccine can prevent cervical cancer. and misconception regarding HPV and HIV and connection between them This study demonstrates the need to add HPV in premarital tests (Almehmadi et al., 2019).

Another study in Bahrain showed positive attitudes towards getting the HPV immunization; however, there is restricted information about HPV and its health implications. Side effects of vaccines are the most concerning factor among participants of this study (Husain et al., 2019). A careful literature review has found that no study was done to assess the awareness, attitude, and practices toward human papilloma virus vaccination among male and female in Taif city, Saudi Arabia. That is why this research paper intended to weigh the awareness, attitude, and practice of people toward HPV vaccination against HPV infections as a risk factor of cervical cancers in Taif City, Saudi Arabia aiming to decrease incidence of cervical cancer among the population of Saudi Arabia.

2. METHODS

This analytical cross-sectional research paper was steered, from November 2021 and the end of January 2022 in Taif, Saudi Arabia. The study population was among parents. The inclusion criteria are as follows: parents of any age, Saudi nationality, and those who live in Taif city. Participants who are unwilling to participate, non-Saudi from another city are excluded. The sample size is about 350. The Qualtrics calculator with a confidence level of 95% calculated it and the margin of error is 5%. The data was collected by a structured questionnaire (survey) in Arabic and distributed online. The questionnaire is classified into three main sections as follows: Section one contains demographic data such as age, gender, and marital status. The second section includes questions to assess the awareness and information around HPV contagion besides cervical cancer as a risk factor. The third section consists of questions to assess awareness, attitude, and practice towards the HPV vaccine. Data entered on the computer using the "Microsoft Office Excel Software program (2016) for Windows." Data is transferred to the Statistical Package of Social Science Software (SPSS) program, version 20 (IBM SPSS Statistics for Windows, Version 20.0 Armonk, NY: IBM Corp) to be statistically analyzed. The study was approved from the research ethics committee of Taif University with approval letter number (43-117).

3. RESULTS

A total of 352 participants were enrolled in this study and had completed a self-administered questionnaire which is designed by professionals and validated. As regards participants' age, most of them 176 (50%) were from 30-50 years old. The majority of them were females 320 (90 %), where males were 10 %. Educational level assessment showed that (57.7%) of them were university students. Most of them 118 (33%) were employed. All descriptive demographic data is shown in (Table 1).

Table 1 Demographic Descriptive analysis of the participants

	Frequency Total=352	Percentage %	Gender Male female	Chi square (P value)
Gender				
Male	32	9.0		
Female	320	90.1		

Age less than 30 30-50 > 50 years Total	 141 176 35 352	 40.1 50.0 9.9 100	 26 5 1 32	 115 171 34 320	0.000
Educational level Middle school or less Secondary school graduate University or more	 27 108 217	 7.6 30.4 61.1	 1 18 13	 26 90 104	0.009
Marital single married divorced/widow	 127 211 14	 35.8 59.4 3.9	 24 8 0	 103 203 14	0.000
Employment state Student employed unemployed/ housewife Retired	 103 118 107 24	 29.0 33.2 30.1 6.8	 25 6 0 1	 78 112 107 23	0.000
Do you have children Yes No	 204 17	 92.3 7.7	 5 3	 199 14	0.017

In the current study, 72(24.08%) of the studied participants know that HPV infection is a risk factor for cervical cancer (Table 2). Table 3 shows the knowledge of the participants regarding Cancer Cervix. 85% of the participants heard about the cancer cervix, Source of knowledge about cancer cervix was TV in 7.6%, Internet/ social media in 42.5%, school, university and work in 6.6%, health care providers in 5%, family and friends in 8.6% and more than one source in 22.6%. Table 4 shows the knowledge of the participants regarding HPV Vaccine. 26.5% heard about HPV vaccine. Internet/ social media were the commonest source of information (11.8%), 16.6% documented that HPV vaccine prevent cancer cervix and other types of HPV cancers and 46.3% were ready to receive the HPV vaccine which can protect you from HPV.

Table 2 Knowledge Regarding HPV infection

	Frequency Total=352	Percentage %	Gender Male female	Chi square (P value)
Hearing about HPV Yes No	 119 233	 33.8 66.2	 19 13 100 220	0.003

Source of information about HPV					
TV	2	0.6	0	2	
Internet websites, social media	48	13.5	6	42	
School, university, work	19	5.4	7	12	
Health care provider	5	1.4	1	4	
Friends or family	4	1.1	0	4	0.301
I don't remember	7	2.0	1	6	
More than one source combined	31	8.7	5	26	
Total	116	32.7	20	96	
HPV infection a sexually transmitted infection?					
Yes	66	18.6	14	52	
No	22	6.2	4	18	0.104
I don't know	28	7.9	1	27	
Total	116	32.7	19	97	
The tenacious great hazard HPV contagion the main cause for cancer cervix and other types of HPV cancer?					
Yes	79	22.3	16	63	
No	5	1.4	1	4	
I don't know	32	9.0	1	31	0.075
Total	116	32.7	18	98	
HPV infection leads to abnormal PAP smear?					
Yes	50	42.0	8	39	
No	8	6.7	1	6	0.851
I don't know	61	51.2	8	53	
Total	119	99.9	17	98	

Table 3 knowledge of the participants regarding Cancer Cervix

	Frequency Total=352	Percentage %	Gender Male	female	Chi square (P value)
Hearing about cancer cervix					
Yes	299	85.0	24	275	
No	53	15.0	8	45	0.118
Total	352	100	32	320	
Source of knowledge about cancer cervix					
TV	23	7.6	1	22	
Internet/ social media	128	42.5	5	121	
school, university, work	20	6.6	4	16	
health care provider	15	5.0	1	14	
family, friends	26	8.6	1	25	0.078
I don't remember	19	6.3	1	20	
more than one source	68	22.6	10	58	
Total	299	100.0	23	276	

Cancer cervix a contagious disease spread through skin contact, sneezing, or cough					
Yes	11	3.7	0	11	
No	141	47.5	16	127	
I don't know/ not sure	147	48.8	8	139	
Total	299	100.0	24	277	0.119
Cancer cervix more common among middle age women					
Yes	120	40.1	14	106	
No	33	11.03	2	33	
I don't know/ not sure	146	48.8	9	138	0.221
Total	299	100.0	25	277	
All women are susceptible to cancer cervix					
Yes	85	28.4	10	75	
No	88	29.4	7	81	
I don't know/ not sure	126	42.2	9	120	0.458
Total	299	100	26	276	
Risk factors for cancer cervix					
early marriage	5	1.67	1	4	
HIV	29	9.6	3	26	
Unsafe sexual contact	38	12.7	3	35	
Smoking	2	0.66	0	2	
Prolonged use of OCP	47	15.7	4	43	
Infection with HPV	72	24.08	3	69	0.788
Multiple causes	106	35.5	10	94	
Total	299	100	24	273	

Table 4 knowledge of the participants regarding HPV Vaccine

	Frequency Total=352	Percentage %	Gender Male	female	Chi square (P value)
Hearing about HPV vaccine					
Yes	94	26.5	15	79	
No	258	72.7	17	241	0.011
Total	352	99.2	32	320	
Source of knowledge about HPV vaccine					
TV	4	1.1	0	4	
newspaper	1	0.3	0	1	
internet/ social media	42	11.8	2	40	
school, university, work	15	4.2	7	8	
doctors or health care providers	6	1.7	0	6	
family or friends	1	0.3	0	1	0.007
i don't remember	3	0.8	0	3	
more than one source	23	6.5	6	17	
Total	92	26.8	15	80	

HPV vaccine prevent cancer cervix and other types of HPV cancers					
Yes	59	16.6	11	48	
No	5	1.4	0	5	
I don't know	28	7.9	1	27	
Total	92	25.9	12	80	0.100
HPV vaccine is a must before the first sexual contact					
Yes	47	13.2	11	48	
No	8	2.3	0	5	
I don't know	37	10.4	1	27	
Total	92	25.9	12	80	0.365
HPV vaccine is given					
Oral	3	0.8	0	3	
Nasal	1	0.3	0	1	
Injection	87	24.5	12	75	0.728
Total	91	25.6	12	79	
Minimum age to give HPV vaccine					
9-11 years	29	8.2	3	26	
12-15 years	20	5.6	3	17	
16-18 years	13	3.7	1	12	
> 18 years	31	8.7	2	29	0.779
Total	93	26.2	9	84	
Everyone up to 26 years old has to get HPV vaccine if he didn’t receive it before					
True	44	12.4	9	35	
false	5	1.4	0	5	
i don't know	43	12.1	2	41	0.053
Total	92	25.9	11	81	
It is not recommended to get the immunization when anyone is more than 26 years old					
True	20	5.6	0	20	
false	18	5.1	5	13	
i don't know	54	15.2	6	48	
Total	92	25.9	11	81	0.030
HPV vaccine cause fever as a side effect					
Yes	43	12.1	3	40	
NO	2	0.6	0	2	
i don't know	45	12.7	8	37	
Total	90	25.4	11	79	0.262
Did you take the HPV vaccine?					
Yes	6	1.7	1	5	
No	309	87.0	24	285	
I don't remember	36	10.1	7	29	0.057
	351	98.9	32	319	

Ready to receive the HPV vaccine which can protect you from HPV					
Yes	175	49.3	16	159	
No	56	15.8	5	51	
i don't know	112	31.5	10	102	
Total	343	96.6	31	312	0.998
Ready to vaccinate your current/ future children, boys or girls?					
Yes	187	52.7	18	169	
No	56	15.8	5	51	
i don't know	108	30.4	9	99	0.932
Total	351	98.9	32	319	
Reasons you don't want to take HPV vaccine (mention all reasons)					
Worry about safety and side effects	84	23.7	6	78	
HPV vaccine is not widely accepted	17	4.8	1	16	
worry about vaccine price	2	0.6	2	0	
worry about efficacy	6	1.7	2	4	
HPV is not a risk factor for cancer cervix	3	0.8	0	3	0.000
the vaccine do not protect from HPV	7	2.0	1	6	
other reasons	36	10.1	1	35	
Total	155	43.7	13	142	
Willing to pay for the HPV vaccine					
Yes	129	36.3	15	114	
No	85	23.9	7	78	
I don't know	134	37.7	9	125	0.365
Total	348	98.0	31	317	

Table 5 presents the relationship between Hearing about HPV and socio-demographic characteristics of the participants. From the table it was clear that the relationship between knowledge about HPV vaccine and age of participants was significant (p value = 0.038), it also showed that there was a significant relationship between gender, employment and knowledge about HPV vaccination (p value =0.008/p value =0.028) respectively, while there was insignificant relationship between marital status, educational level and HPV vaccine knowledge (p value=0.288/0.112) respectively. Table 6 presents the relationship between hearings about cancer cervix with socio-demographic appearances of the contributors. There was significant relationship between hearings about cancer cervix and age, educational level, marital status and employment of the participants (P<0.05). Table 7 shows the relationship between hearings about HPV vaccine with socio-demographic appearances of the contributors. Age and gender were significantly related to hearing about HPV vaccine (P<0.05). Figure 1 illustrates the risk factors for cancer cervix indicating multiple causes combined is the highest percentage, followed by infection with HPV, prolonged use of OCP, unsafe sexual contact, and HIV infection and early marriage.

Table 5 the relationship between Hearing about HPV and socio-demographic characteristics of the participants

		Hearing about HPV		Total (n=352)	P value
		Yes (n=119)	No (n=233)		
Age	less than 30	56	85	141	0.136
		47.1%	36.5%	40.1%	
	30-50	54	122	176	
		45.4%	52.4%	50.0%	
	> 50 years	9	26	35	

		7.6%	11.2%	9.9%	
Gender	Male	19	13	32	0.001
		16.0%	5.6%	9.1%	
	Female	100	220	320	
		84.0%	94.4%	90.9%	
Educational level	Middle school or less	6	21	27	0.073
		5.0%	9.0%	7.7%	
	Secondary school	45	63	108	
		37.8%	27.0%	30.7%	
	University or more	68	149	217	
		57.1%	63.9%	61.6%	
Marital status	Single	48	79	127	0.47
		40.3%	33.9%	36.1%	
	Married	67	144	211	
		56.3%	61.8%	59.9%	
	Divorced/widow	4	10	14	
		3.4%	4.3%	4.0%	
Do you have children	Yes	65	139	204	0.173
		95.6%	90.8%	92.3%	
	No	3	14	17	
		4.4%	9.2%	7.7%	
Employment	Student	45	58	103	0.05
		37.8%	24.9%	29.3%	
	employed	31	87	118	
		26.1%	37.3%	33.5%	
	unemployed/ housewife	34	73	107	
		28.6%	31.3%	30.4%	
	Retired	9	15	24	
		7.6%	6.4%	6.8%	

Table 6 the relationship between hearings about cancer cervix with socio-demographic appearances of the contributors

		Hearing about cancer cervix		Total (n=352)	P value
		Yes (n=200)	No (n=21)		
Age	less than 30	109	32	141	0.003
		36.5%	60.4%	40.1%	
	30-50	160	16	176	
		53.5%	30.2%	50.0%	
	> 50 years	30	5	35	
		10.0%	9.4%	9.9%	
Gender	Male	24	8	32	0.087
		8.0%	15.1%	9.1%	
	Female	275	45	320	
		84.0%	94.4%	90.9%	
Educational level	Middle school or less	21	6	27	0.061
		7.0%	11.3%	7.7%	
	Secondary school	86	22	108	
		28.8%	41.5%	30.7%	
	University or more	192	25	217	
		64.2%	47.2%	61.6%	

Marital status	single	95	32	127	0.001
		31.8%	60.4%	36.1%	
	married	191	20	211	
		63.9%	37.7%	59.9%	
	Divorced/widow	13	1	14	
		4.3%	1.9%	4.0%	
Employment	Student	78	25	103	0.021
		26.1%	47.2%	29.3%	
	Employed	105	13	118	
		35.1%	24.5%	33.5%	
	Unemployed/ housewife	95	12	107	
		31.8%	22.6%	30.4%	
	Retired	21	3	24	
		7.0%	5.7%	6.8%	

Table 7 the relationship between Hearings about HPV vaccine with socio-demographic appearances of the contributors

		Hearing about HPV vaccine		Total (n=352)	P value
		Yes (n=94)	No (n=258)		
Age	less than 30	48	93	141	0.038
		51.1%	36.0%	40.1%	
	30-50	39	137	176	
		41.5%	53.1%	50.0%	
	> 50 years	7	28	35	
		7.4%	10.9%	9.9%	
Gender	Male	15	17	32	0.008
		16.0%	6.6%	9.1%	
	Female	79	241	320	
		84.0%	93.4%	90.9%	
Educational level	Middle school or less	3	24	27	0.112
		3.2%	9.3%	7.7%	
	Secondary school	27	81	108	
		28.7%	31.4%	30.7%	
	University or more	64	153	217	
		68.1%	59.3%	61.6%	
Marital status	single	40	87	127	0.288
		42.6%	33.7%	36.1%	
	married	50	161	211	
		53.2%	62.4%	59.9%	
	Divorced/widow	4	10	14	
		4.3%	3.9%	4.0%	
Employment	student	38	65	103	0.028
		40.4%	25.2%	29.3%	
	employed	30	88	118	
		31.9%	34.1%	33.5%	
	unemployed/ housewife	20	87	107	
		21.3%	33.7%	30.4%	
	Retired	6	18	24	
		6.4%	7.0%	6.8%	

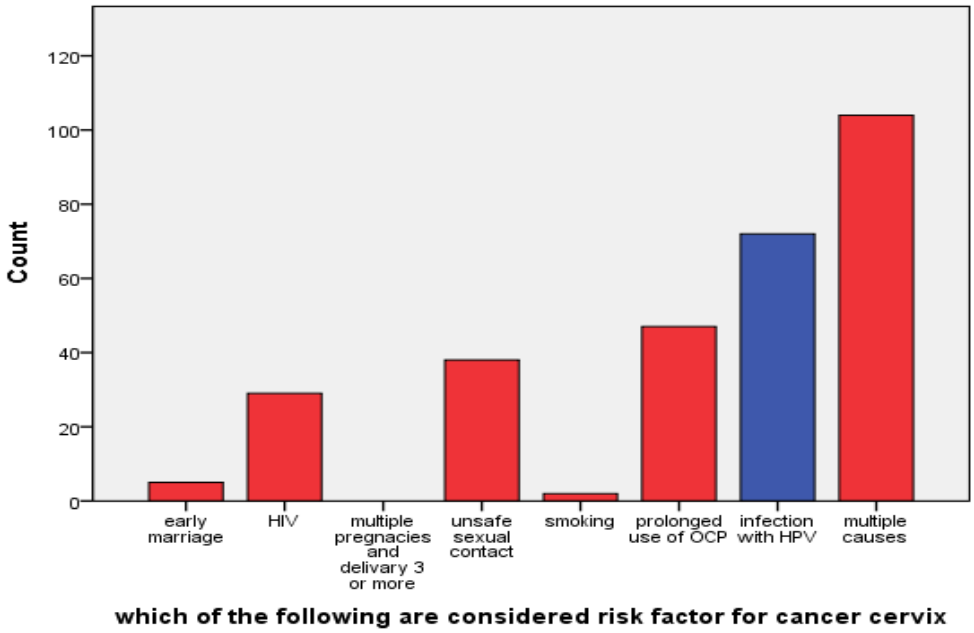

Figure 1 Bar chart showing the risk factors for cancer cervix indicating multiple causes combined is the highest percentage, followed by infection with HPV, prolonged use of OCP, unsafe sexual contact, and HIV infection and early marriage.

4. DISCUSSION

Worldwide about 15 per cent and nearly 26 per cent of cancer cases in developing countries are attributed to infectious agents, particularly viruses (Shah et al., 2019). Cervical cancer, which is mainly caused by specific types of high-risk (HR) human papillomavirus (HPV) infection, is a leading cause of cancer-related deaths among women in India. HR HPV types 16 and 18 infections are considered responsible for about 75-80 per cent of cervical cancer worldwide (Chawla et al., 2016). The prevalence of HPV infection is about 31% in the overall populace of KSA, 80% of women with cytological abnormalities and >92% of women with cervical carcinoma (Al-Muammar et al., 2007). The populace of KSA at risk for cervical cancer (Basu, 2007) female population aged >15 years) is 6.51 million as per the World Health Statistics Report 2010 of the WHO (Alsbeih, 2014). As per the 2010 Saudi Cancer Registry report, the number of newly diagnosed cervical cancers is rising significantly: 153 original cases of cervical malignancy were diagnosed in 2010 in the KSA.

Alqahtani et al., (2020) stated that cervical cancer is the 8th most common cancer in Saudi women aged from 30 to 44 years, while it is the 4th most common cancer among non-Saudi women residing in Saudi Arabia. For Saudis and non-Saudis, the most prevalent age range for cervical cancer was 40–44 and 45-49 years old respectively. Two prevention vaccines, specifically (Gardasil) then (Cervarix) appropriate through the USFDA (US Food and Drug Administration) are available for vaccination of adolescent girls. According to the study of Basu et al., (2009), prophylactic HPV vaccination can reduce the burden of cervical cancer by more than 75 per cent. Our purpose is to assess the Awareness, Attitude, and Practice of Parents toward Human Papilloma Virus Vaccination against HPV Infections as a Risk Factor OF Cervical Cancers in Taif City, Saudi Arabia. It is aiming to decrease the occurrence of cervical malignance in the residents of KSA.

Our study showed that (33.8%) out of the total participants had already heard about HPV infection. The source of the information is mainly from the internet, websites, and social media, followed by multiple sources combined, then come the role of school, university, or work. Another study conducted in Bangladesh (Basu et al., 2009), they aimed to assess overall Bangladeshi public information, arrogances, and habits surrounding the human papillomavirus and its vaccine, showed that 43.29% of the respondents were knowledgeable enough about the HPV infections and its' vaccination. Another study conducted in Iranian population (Chowdhury et al., 2022) revealed that the quality of information round HPV contagion in addition to vaccination in Iranian population is concerning. The knowledge was poor; however, the attitude toward HPV infection and its vaccination was positive and strong.

In the current study, 72(24.08%) of the studied participants know that HPV infection is a hazard influence for cervical malignancy. Similarly, Islam et al., (2018), a cross-sectional study was performed in 2018 among the Bangladeshi women, there were

little awareness about the risk factors of cervical cancer with high desires to get HPV vaccination was reported. In contrast, a cross-sectional study by Islam et al., (2015) on Bangladeshi women in childbearing period unexpectedly revealed a high degree of knowledge regarding cervical cancer and HPV as a significant risk factor (81%) also, Alsous et al., (2021) conducted a study to evaluate the knowledge about CC and HPV contagion and awareness towards and perceived barriers of HPV immunization amongst medicinal scholars in Jordan, they stated that, in regards to knowledge about CC, the mean knowledge notch intended for scholars was 21.4 ± 4.4 and most participants (81.9%) distinguished that CC is instigated thru an contagion, in addition, that HPV is accountable for a extensive collection of diseases comprising CC (90.3%).

Our study revealed that the relationship between knowledge about HPV vaccine and age of participants was significant (p value = 0.038), it also showed that there was a significant relationship between gender, employment and knowledge about HPV vaccination (p value =0.008/p value =0.028) respectively, while there was insignificant relationship between marital status, educational level and HPV vaccine knowledge (p value=0.288/0.112) respectively. Another study (Blodt et al., 2012) showed that there was no significant difference in knowledge by age (adolescents [33%] vs. adults [31%]), on the other hand the study conducted in Bangladesh revealed that contributors who attended private institutions learned more than those who attended government ones. Furthermore, people aged 26 to 30 years knew more about HPV and its vaccine than other age groups. In terms of attitude, females were more favorable towards HPV vaccination than males, and students from private colleges were more positive than students from public universities.

In terms of vaccination history and practice, married female participants were more likely to practice well than men (Goyal, 2016). On the other hand, Semi-structured interview and questionnaire delivered in a street survey (Walsh et al., 2008) showed that Significant differences in knowledge scores between age groups (scores >0: 16.24 = 12.7%, 25–34 = 19.8%, 35–44 = 17.5%, 45–54 = 28%), and by gender (scores >0: males = 14.5%, females = 21.8%). A number of researches steered in developed nations have established that the universal public, chiefly parents of adolescents, do not vaccinate their children against HPV because regulation and immunization commendations from health care providers are the main reason. It is shown that they believe that it is the lack of to overcome this situation, educating and educating a healthcare intermediary about her HPV and its vaccines should be a priority. Therefore, it is imperative to first assess the facts, attitudes, and standards of practice of health care workers before evaluating this goal (Brotherton et al., 2010).

5. CONCLUSION

This study confirmed an insufficient, limited, level of understanding around CC and the HPV vaccine; Factors affecting having adequate level of knowledge is being a Female, less than 30 years old, student, married correlated with enough information about HPV, methods of its spread, its possible role in cancer cervix. Having a sufficient knowledge is statistically significant correlated with acceptance to take the HPV vaccine, understanding that the vaccine can protect from HPV infection and Cancer cervix, and being ready to vaccinate your offspring, even being eager to recompense for the vaccine on his/ her own. It is highly recommended to expand the level of knowledge by implementing large educational campaigns.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Author Contributions

We certify, as authors, that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor. All persons who have made substantial contributions to the work reported in the manuscript.

Ethical approval

The study was approved from the research ethics committee of Taif University with approval letter number (43-117).

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Conflicts of interest
The authors declare that there are no conflicts of interests.

Data and materials availability
All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. 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(4):584-590.
2. Almehmadi MM, Salih MM, Al-Hazmi AS. Awareness of human papillomavirus infection complications, cervical cancer, and vaccine among the Saudi population. A cross-sectional survey. Saudi Med J 2019; 40(6):555-559.
3. Al-Muammar T, Al-Ahdal MN, Hassan A, Kessie G, Dela Cruz DM, Mohamed GE. Human papilloma virus-16/18 cervical infection among women attending a family medical clinic in Riyadh. Ann Saudi Med 2007; 27(1):1-5.
4. Alqahtani WS, Almufareh NA, Domiaty DM, Albasher G, Alduwish MA, Alkhalaf H, Almuzzaini B, Al-Marshidy SS, Alfraihi R, Elasbali AM, Ahmed HG, Almutlaq BA. Epidemiology of cancer in Saudi Arabia thru 2010-2019: a systematic review with constrained meta-analysis. AIMS Public Health 2020; 7(3):679-696.
5. Alsbeih G. HPV Infection in Cervical and Other Cancers in Saudi Arabia: Implication for Prevention and Vaccination. Front Oncol 2014; 4:65 doi: 10.3389/fonc.2014.00065. PMID: 24744990; PMCID: PMC3978341.
6. Alsous MM, Ali A, Al-Azzam S, Karasneh R, Amawi H. Knowledge about cervical cancer and awareness about human papillomavirus vaccination among medical students in Jordan. Peer J 2021; 9:e11611 doi: 10.7717/peerj.11611. PMID: 34178471; PMCID: PMC8214844.
7. Alsous MM, Ali AA, Al-Azzam SI, Abdel Jalil MH, Al-Obaidi HJ, Al-Abbadi EI, Hussain ZK, Jirjees FJ. Knowledge and awareness about human papillomavirus infection and its vaccination among women in Arab communities. Sci Rep 2021; 11(1):786-791.
8. Altamimi T. Human papillomavirus and its vaccination: Knowledge and attitudes among female university students in Saudi Arabia. J Family Med Prim Care 2020; 9(4):1849-1855.
9. Basu P, Roychowdhury S, Bafna UD, Chaudhury S, Kothari S, Sekhon R, Saranath D, Biswas S, Gronn P, Silva I, Siddiqi M, Ratnam S. Human papillomavirus genotype distribution in cervical cancer in India: results from a multi-center study. Asian Pac J Cancer Prev 2009; 10(1):27-34.
10. Blodt S, Holmberg C, Muller-Nordhorn J, RieckmannN. Human Papillomavirus awareness, knowledge and vaccine acceptance: a survey among 18-25-year-old male and female vocational school students in Berlin, Germany. Eur J Public Health 2012; 22:808–813.
11. Brotherton JM, Kaldor JM, Garland SM. Monitoring the control of human papillomavirus (HPV) infection and related diseases in Australia: towards a national HPV surveillance strategy. Sex Health 2010; 7(3):310-319.
12. Chawla PC, Chawla A, Chaudhary S. Knowledge, attitude & practice on human papillomavirus vaccination: A cross-sectional study among healthcare providers. Indian J Med Res 2016; 144(5):741-749.
13. Chowdhury S, Ara R, Roy S, Tanvir SMS, Eva FN, Neela TM, Moonmoon AA, Sifat S, Zamila M, Hawlader MDH. Knowledge, attitude, and practices regarding human papillomavirus and its' vaccination among the young medical professionals and students of Bangladesh. Clin Exp Vaccine Res 2022; 11(1):63-71.
14. Farsi NJ, Baharoon AH, Jiffri AE, Marzouki HZ, Merdad MA, Merdad LA. Human papillomavirus knowledge and vaccine acceptability among male medical students in Saudi Arabia. Hum Vaccin Immunother 2021; 17(7):1968-1974.
15. Gilham C, Sargent A, Kitchener HC, Peto J. HPV testing compared with routine cytology in cervical screening: long-term follow-up of ARTISTIC RCT. Health Technol Assess 2019; 23(28):1-44.
16. Goyal G. Knowledge, Attitude and Practice of Chewing Gutka, Areca Nut, Snuff and Tobacco Smoking Among the Young Population in the Northern India Population. Asian Pac J Cancer Prev 2016; 17(11):4813-4818.
17. Husain Y, Alalwan A, Al-Musawi Z, Abdulla G, Hasan K, Jassim G. Knowledge towards human papilloma virus (HPV) infection and attitude towards its vaccine in the Kingdom of Bahrain: cross-sectional study. BMJ Open 2019; 9(9):e031017 doi: 10.1136/bmjopen-2019-031017.

18. Islam JY, Khatun F, Alam A, Sultana F, Bhuiyan A, Alam N, Reichenbach L, Marions L, Rahman M, Nahar Q. Knowledge of cervical cancer and HPV vaccine in Bangladeshi women: a population based cross-sectional study. BMC Womens Health 2018; 18(1):15 doi: 10.1186/s12905-018-0510-7.
19. Islam RM, Bell RJ, Billah B, Hossain MB, Davis SR. Lack of understanding of cervical cancer and screening is the leading barrier to screening uptake in women at midlife in Bangladesh: population-based cross-sectional survey. Oncol 2015; 20:1386–1392.
20. Sabr Y, Abdulfattah DW, Alboqami OA, Alogaily NS, Omar TA, Beyari NB, Alotaibi RS. A cognitive behavioral perspective about attitude, perception and acceptability of vaccination against human papilloma virus. Medical Science 2021; 25(107):213-223
21. Shah SC, Kayamba V, Peek RM Jr, Heimburger D. Cancer Control in Low- and Middle-Income Countries: Is It Time to Consider Screening? J Glob Oncol 2019; 5(1):1-8.
22. Walsh CD, Gera A, Shah M, Sharma A, Powell JE, Wilson S. Public knowledge and attitudes towards Human Papilloma Virus (HPV) vaccination. BMC Public Health 2008; 8:368 doi: 10.1186/1471-2458-8-368.
23. Zhou X, Sun L, Yao X, Li G, Wang Y, Lin Y. Progress in Vaccination of Prophylactic Human Papillomavirus Vaccine. Front Immunol 2020; 11:1434-1439.