

# Awareness and Orientation towards HPV Vaccination among Women in Northern and Middle Regions KSA, A Cross Sectional Study

Lama Bader Abdulkarim Ateeq Rashed<sup>1</sup>, Renad Abdulrahman Saleh Abdullah Altuwaiher<sup>2</sup>,  
Zahra Sadiq Abdulazim Almumtin<sup>3</sup>, Soha Abdallah Moursi<sup>4</sup>

**Abstract:** Objectives: Increase the awareness of HPV infection among society specially young females, spread knowledge of the factors related to it, complications and importance of HPV vaccination. Materials and Methods: surveillance cross sectional study, data were collected as questionnaires distributed to groups of peoples in Northern and Middle region in KSA, above 18 years old from 1<sup>st</sup> of October 2022 till 31<sup>st</sup> of March 2023, statistical analysis was done by SPSS22 program at significance of > 0.05 and Microsoft Excel-2016 software. Ethical approval was obtained from the ethical committee at the University of Hail (Number H-2022-416). Results: 550 responses to questionnaires, the study findings showed range of participants demographic data mostly aged between (18-30) years old by (81.5%). (59.3%) were the responses from Northern region. The results also showed that (70%) of the participants were females, (98.2%) were Saudi. As for material state (74.5%) were single. Educational level the highest responses were from university students by (68.9%) and as for employment status (56.7%) of participant were students. For awareness data (48.9%) did not know that HPV is sexually transmitted disease and have no idea that condom uses can prevent transmission by (56%). Further, (59.3%) not familiar with the HPV is one of the premarital test in Saudi Arabia and by (50%) don't know that HPV can infect both males and females. Only (24.2%) aware that the incidence of HPV is highest among 30s years old women. (63.5%) of the participants did not know that HPV can be without any symptoms and only (33.6%) were aware about HPV genital warts. (22.4%) thinking that HPV could not be resolved spontaneously and (39.6%) only answered that HPV can cause cervical cancer while (24.9%) responded that all cases of cervical cancer caused by HPV. More than half of the participants did not aware that cervical cancer incidence increase annually in KSA. (50.5%) of the answer thinking that HPV can be prevented while (36.7%) only think by vaccination, (38.7%) agreed that the vaccine is safe. (27.5%) of the replies concerned that HPV vaccine can cause sterility or tumor and (15.3%) were opposed to HPV vaccination. Conclusion: Despite that HPV testing is one of premarital request in KSA and the vaccine is scheduled in KSA immunization schedule still the knowledge about it very poor. Spreading the knowledge and updates among society specially females about HPV infection, factors and vaccination can lead to minimize cases and help in decreasing numbers of cervical cancer as a prognosis associated with such infection. Recommendation: to educate students in university level about sexual transmitted diseases in general and about HPV vaccination importance.

**Keywords:** HPV infection, HPV vaccine, Awareness, KSA, vaccination

## 1. Introduction

In 2019<sup>th</sup> the KSA Ministry of Health applied Human papillomavirus (HPV) vaccine as one of the National immunization schedules of KSA at age of 11 years old for females, the vaccine was approved by Saudi Food and Drug authority in 2010 [1-3]. HPV concenter one of the sexually transmitted diseases worldwide can lead to different types of cancer in males and females as its complication. It's a DNA virus with 100 subtypes, the infection characterized by presences of warts and precancerous lesions. The risk of developing different types of cancers due to HPV infection common and depending on the site of infection as vagina, valve, cervix, penis, mouth, throat and anal opening [4]. Cervical cancer cases showed increasing in KSA in 3 years interval screening frequency and concenter the 8<sup>th</sup> most frequent cancer among women in Saudi Arabia between 15 and 44 years old [5]. HPV vaccine can help in preventing infection by subtypes HPV16 and HPV18, the two most causative carcinogenic agents [6]. Three vaccines are available to prevent infection by some HPV types: Gardasil, Gardasil 9 and Cervarix can give protection against infection with HPV subtypes 16 and 18 and approved in Saudi Arabia [7-8].

**The aim of the study to** increase the awareness of HPV infection between society members in Northern and Middle

regions in KSA, its complications and the importance of HPV vaccination specially in young females.

## 2. Materials and Methods

**Study Design:** This study was designed as a community-based, cross-sectional study to assess the general population's awareness and orientation towards HPV vaccination among women in Northern and Middle regions KSA participants who who declined to participate, and those who did not finish the entire questionnaire were excluded.

**Study population:** Above 18years old/males and females / Citizen and Residents/University students / all levels of education /Medical care workers.

**Sample collection and processing:** Data collection as Questionnaire, Soft and hard copies of questionnaires distributed to groups of people in Northern and Middle regions in KSA, and on social media from 1st of October 2022 till 31st of March 2023.

**Study sampling:** A total of 550 participated in this study. **Statistical Analysis:** Data analysis was performed using statistical Package for social Sciences SPSS (version 22) program at significance of > 0.05 and Microsoft Excel-2016 software.

**Ethical Consent:** Informed Consent was addressed during this study; Ethical approval was obtained from the ethical committee at the University of Hail (Number H-2022-416). The purpose of the study was explained to all participants, and only those who provided informed consent were included in the study. All participants were guaranteed that their confidentiality would be maintained, and no personal information was requested on the questionnaire.

### 3. Results

A total of 550 responses received in this study, the data finding showed that participant from northern region were the highest by (59.3%) followed by, central region (40.7%). For sociodemographic characteristics of participants as illustrated in **Table 1**, (81.5%) were age ranged between 18-30 years old followed by (12.4%) ranged from 31-45 and only (6.1%) age between 46-65 years old. The majority of participants were female (70%) and Saudi nationality by (98.2%). (74.5%) of the participant were single and University students as educational level by (68.9%) and (56.7%) as employment status.

**Table 1:** Sociodemographic characteristic of participants

1-Age in years					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30	448	81.5	81.5	81.5
	31-45	68	12.4	12.4	93.9
	46-65	23	6.1	6.1	100
	Total	550	100	100	
2-Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	165	30	30	30
	Female	385	70	70	100
	Total	550	100	100	
3-Nationality					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saudi	540	98.2	98.2	98.2
	Non-Saudi	10	1.8	1.8	100
	Total	550	100	100	
4-Marital status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	410	74.5	74.5	74.5
	Married	124	22.5	22.5	97
	Divorced	16	3	3	100
	Total	550	100	100	
5-Education level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary	151	27.5	27.5	27.5
	University	379	68.9	68.9	96.4
	Post-graduate	20	3.6	3.6	100
	Total	550	100	100	
6-Employment status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not working	93	16.9	16.9	16.9
	Student	312	56.7	56.7	73.6
	Trainee	11	2	2	75.6
	Employee	121	22	22	97.6
	Retired	13	2.4	2.4	100
	Total	550	100	100	

#### For HPV knowledge and awareness

In **Table 2** the results showed that (48.5%) of the participants did not know about that the HPV can be transmitted sexually and have no idea that condom can prevent transmission by (56%), also the majority answered I don't know for the testing for HPV is one of the premarital testing in Saudi Arabia by (59.3%). for the awareness about that HPV can infect both male and female about (50%) not a wear about this fact, more than half of the participant didn't know that HPV incidence increases among women in their

30s by (67.8%) and (63.5%) poor knowledge of HPV infection without symptoms. Only 33% answered correctly for the HPV infection characterized by genital warts. (22.4%) answered incorrectly that HPV can be resolved spontaneously while only (36.9%) of the participants know that HPV can lead to cervical cancer. The data also showed that (66.5%) of the responses were not recognizing the increasing of cervical cancer incidence in Saudi Arabia annually. (50%) of the answers were correct about that HPV can be prevented.

Table 2: HPV knowledge and awareness

<b>1-Human papillomavirus (HPV) infection is sexually transmitted disease</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	244	44.4	44.4	44.4
	Incorrect	37	6.7	6.7	51.1
	Don't know	269	48.9	48.9	100
	Total	550	100	100	
<b>2-Condom use can prevent the transmission of HPV infection</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	174	31.6	31.6	31.6
	Incorrect	68	12.4	12.4	44
	Don't know	308	56	56	100
	Total	550	100	100	
<b>3-Testing for HPV infection is one of premarital testing in Saudi Arabia .</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	141	25.6	25.6	25.6
	Incorrect	83	15.1	15.1	40.7
	Don't know	326	59.3	59.3	100
	Total	550	100	100	
<b>4-HPV can infect both, males and females</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	218	39.6	39.6	39.6
	Incorrect	57	10.4	10.4	50
	Don't know	275	50	50	100
	Total	550	100	100	
<b>5-The incidence of HPV in females is highest among women in their 30s.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	133	24.2	24.2	24.2
	Incorrect	44	8	8	32.2
	Don't know	373	67.8	67.8	100
	Total	550	100	100	
<b>6-HPV infections can be without symptoms.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	137	24.9	24.9	24.9
	Incorrect	64	11.6	11.6	36.5
	Don't know	349	63.5	63.5	100
	Total	550	100	100	
<b>7-Genital warts indicate HPV infection.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	185	33.6	33.6	33.6
	Incorrect	32	5.8	5.8	39.4
	Don't know	333	60.6	60.6	100
	Total	550	100	100	
<b>8-Most cases of HPV infection are resolved spontaneously.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	67	12.2	12.2	12.2
	Incorrect	123	22.4	22.4	34.5
	Don't know	360	65.5	65.5	100
	Total	550	100	100	
<b>9-HPV infection can cause cervical cancer</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	203	36.9	36.9	36.9
	Incorrect	22	4	4	40.9
	Don't know	325	59.1	59.1	100
	Total	550	100	100	
<b>10-The annual incidence of cervical cancer increases among women in Saudi Arabia.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	135	24.5	24.5	24.5
	Incorrect	49	8.9	8.9	33.5
	Don't know	366	66.5	66.5	100
	Total	550	100	100	
<b>11-HPV infection is preventable.</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	278	50.5	50.5	50.5
	Incorrect	17	3.1	3.1	53.6
	Don't know	255	46.4	46.4	100
	Total	550	100	100	

## HPV Vaccination

As illustrated in **Table 3**, (36.8%) of the participant agreed that HPV vaccine can be helpful in preventing cervical cancer, while (38.7%) thinking that HPV vaccination is safe ,on the other hand (67.1%) didn't know that the vaccine is for both male and females and (74.2%) not aware that the vaccine could be given to confirmed cases .(18.4%) thinking that the HPV is too new and may has some side effects ,while (27.5%) believed that HPV vaccine can cause sterility and tumor and (15.3%) were opposed to the vaccination .

**Table 3: HPV Vaccination.**

1-HPV vaccines are helpful to prevent cervical cancer.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	202	36.7	36.7	36.7
	Incorrect	31	5.6	5.6	42.4
	Don't know	317	57.6	57.6	100.0
	Total	550	100.0	100.0	
2-HPV vaccine is safe.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	213	38.7	38.7	38.7
	Incorrect	22	4.0	4.0	42.7
	Don't know	315	57.3	57.3	100.0
	Total	550	100.0	100.0	
3-HPV vaccine is available for both males and females.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	148	26.9	26.9	26.9
	Incorrect	33	6.0	6.0	32.9
	Don't know	369	67.1	67.1	100.0
	Total	550	100.0	100.0	
4-Men and women diagnosed with HPV should not be given the HPV vaccine.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	84	15.3	15.3	15.3
	Incorrect	58	10.5	10.5	25.8
	Don't know	408	74.2	74.2	100.0
	Total	550	100.0	100.0	
5-I feel that the vaccine is too new and hasn't been around long enough to know it's side effects					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct	101	18.4	18.4	18.4
	Incorrect	94	17.1	17.1	35.5
	Don't know	355	64.5	64.5	100.0
	Total	550	100.0	100.0	
6-I am concerned about HPV vaccine that it can cause sterility or tumor					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	151	27.5	27.5	27.5
	No	168	30.5	30.5	58.0
	Don't know	231	42.0	42.0	100.0
	Total	550	100.0	100.0	
7-I am opposed to HPV vaccination					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	84	15.3	15.3	15.3
	No	231	42.0	42.0	57.3
	Don't know	235	42.7	42.7	100.0
	Total	550	100.0	100.0	

## 4. Discussion

*Human papillomavirus* (HPV) concenter one of the emerging sexual transmitted infectious diseases and a leading cause of viral associated with cervical cancer [9]. In this study the results showed that the participants from Northern and Middle region of KSA have poor knowledge about HPV infection ,its complication and the HPV vaccination by assessing the awareness and level of knowledge .Participants of this current study ,which covered Northern and Middle region of KSA –few previous studies limited data - mostly were students (56.7%) in comparison with other studies [10,11] older age and higher level of education have a positive impact on the awareness and knowledge of HPV .In agreement with [12] poor knowledge was reported among student in Hail university .Recently studies in different countries have been made to asses and evaluate the knowledge and awareness of communicable disease emerging such as HPV as one of the most important causes of cervical cancer all over the world and the cause of increasing incidence of such type of cancer among females annually in Saudi Arabia [13-16-5]. The population of this study were (70% ) females and university students (68.9%) lack of knowledge observed also with the results showed (Table 2) the answers to the questions about HPV transmitted sexually(48.9%) and can infect male and female by (50%) , the infection could be occur without symptoms by (63.5%) and if uses of condom can prevent the trans mission of infection by (56%), the infection causes warts by(60.6%) and can lead to cervical cancer among women by(59.1%) , so improving the level of awareness and orientation towards the HPV is very important specially among young age also education about sexually transmitted diseases and its complication should be applied on university level students ,likewise reported by [17-19]. For HPV vaccination (57.3%) of the results showed that the participants were not aware that the vaccine is safe and one of the premarital testing in KSA (59.3%) while (64.5%) did not know if the vaccine were tested enough to be used or having side effects and in a good results (42%) were with the HPV vaccination (Table 3). Depending on the current results there were in an alignment with [20-23].

## 5. Conclusion

Awareness is the golden key to manage any emerging public health problem. despite that HPV testing is one of premarital request in KSA and the vaccine is scheduled in KSA immunization schedule still the knowledge about it very poor. Spreading the knowledge and updates among society specially females about HPV infection, factors and vaccination can lead to minimize cases and help in decreasing numbers of cervical cancer as a prognosis associated with such infection.

## 6. Recommendation

To educate students in university level about sexual transmitted diseases in general and about HPV vaccination importance.

## Acknowledgment

The Authors of this study would like to express gratitude to participants to Taif gazaa besheer mtleg Alanzi and Lama saeed moeed alzahrani from Hail University, Manar Saleh Thoael Almutairi, from King Saud bin Abdulaziz for Health Science and Salem Mohammed Asaad Ayyashi, from Jazan University who help in collecting data from different regions in KSA.

## References

- [1] National Immunization Schedule: Ministry of Health. (2019). [accessed 2022 NOV 20]. <https://www.moh.gov.sa/en/HealthAwareness/EducationalContent/HealthTips/Documents/Immunization-Schedule.pdf>.
- [2] CDC HPV Vaccine. Available online: <https://www.cdc.gov/hpv/index.html> (accessed on 23 NOV 2022).
- [3] MoH Calls for Giving Girls HPV Vaccine at an Early Age. Available online: <https://saudigazette.com.sa/article/620264/SAUDIARABIA/MoH-calls-for-giving-girls-HPV-vaccine-at-an-early-age> (accessed on 20 November 2022).
- [4] Alrajeh, M.F.; Alshammari, S.A (2020). Awareness of Human Papillomavirus and Its Vaccine among Patients Attending Primary Care Clinics at King Saud University Medical City. *J. Nat. Sci. Med.* 3, 189.
- [5] Almeahadi, M.M.; Salih, M.M.; Al-Hazmi, A.S (2019) Awareness of Human Papillomavirus Infection Complications, Cervical Cancer, and Vaccine among the Saudi Population. A Cross-Sectional Survey: A Cross-Sectional Survey. *Saudi Med. J.* 40, 555-559.
- [6] Bruni L, Albero G, Serrano B, Mena M, Gómez D, Muñoz J, Bosch FX, de Sanjosé S (17 June 2019). ICO/IARC information centre on HPV and cancer (HPV) information centre). Human papillomavirus and related diseases in the world. Summary Report; <https://www.hpvcentre.net/statistics/reports/XWX.pdf>.
- [7] Human Papillomavirus Epidemiology and Prevention of Vaccine-Preventable Diseases". CDC.gov. from the original on 3 February 2014. Retrieved 30 January 2014.
- [8] Obeid, D.A.; Almatrouk, S.A.; Khayat, H.H.; Al-Muammer, T.A.; Tulbah, A.M.; Albadawi, I.A.; Al-Ahdal, M.N.; Alhamlan, (2020). F.S. Human Papillomavirus Type 16 and 18 Viral Loads as Predictors Associated with Abnormal Cervical Cytology among Women in Saudi Arabia. *Heliyon* 6, e03473.
- [9] WHO (2022). One-Dose Human Papillomavirus (HPV) Vaccine Offers Solid Protection against Cervical Cancer. *Saudi Med. J.* 43, 538.
- [10] Hussain A, Alkhenizan A, McWalter P, Qazi N, Alshmassi A, Farooqi S, et al. (2016). Attitudes and perceptions toward HPV vaccination among young women in Saudi Arabia. *J Family Community Med* 23:145-50.
- [11] Al-Darwish, A.A.; Al-Naim, A.F.; Al-Mulhim, K.S. Al-Otaibi, N.K.; Morsi, M.S.; Aleem, A.M (2014). Knowledge about Cervical Cancer Early Warning Signs and Symptoms, Risk Factors and Vaccination among Students at a Medical School in Al-Ahsa, Kingdom of Saudi Arabia. *Asian Pac. J. Cancer Prev.* 15, 2529-2532.
- [12] Altamimi, T (2020). Human Papillomavirus and its Vaccination: Knowledge and Attitudes among Female University students in Saudi Arabia. *J. Fam. Med. Prim. Care.* 9, 1849-1855.
- [13] Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al (2012). (2015). Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN. *Int J Cancer* 136:E359-86.
- [14] Gamaoun, R (2018). Awareness and Knowledge about Cervical Cancer Prevention Methods among Tunisian Women. *J. Prev. Med. Hyg.* 59, E30-E35.
- [15] Meites E, Szilagyi PG, Chesson HW, Unger ER, Romero JR, Markowitz LE (2019). Human papillomavirus vaccination for adults: updated recommendations of the advisory committee on immunization practices. *MMWR Morb Mortal Wkly Rep.* 30;68:698-702. doi:10.15585/mmwr.mm6832a3externalicon
- [16] European Centre for Disease Prevention and Control (ECDC). Human papillomavirus infection: recommended vaccinations. Vaccine Scheduler; [accessed 2022 November 20]. <https://vaccine-schedule.ecdc.europa.eu/Scheduler/ByDisease?SelectedDiseaseId=38&SelectedCountryIdByDisease=-1>.
- [17] Fageeh WM (2014). Sexual behavior and knowledge of human immunodeficiency virus/aids and sexually transmitted infections among women inmates of Briman Prison, Jeddah, Saudi Arabia. *BMC Infect Dis* 14:290. doi:10.1186/1471-2334-14-290.
- [18] Gamaoun R (2018). world health organization ,Regional office for the Eastern Mediterranean, Cairo ,Egypt. Knowledge, Awareness and Acceptability of Anti-HPV Vaccine in the Arab Status of Middle East and North Africa Region ,A systematic review .*East Mediterr. Health. J.* 24.2.
- [19] Farsi N J, Baharoon A H, Jiffri AE, Marzouki H Z, Merdad L A (2021). Human Papillomavirus Knowledge and vaccine acceptability among Male Medical Students in Saudi Arabia. *Hum. Vaccin. Immunother.* 17, 1968-1974.
- [20] AlBadawi IA, AlSuwaine A, AlAker M, Asaad L, Alaidan A, Tulbah A, et al (2011) Detection and genotyping of human papilloma virus in cervical cancer specimens from Saudi patients. *Int J Gynecol Cancer*; 21:90710.
- [21] Markowitz LE, Dunne EF, Saraiya M, Chesson HW, Robinette Curtis C, Gee J, et al (2014). Human papillomavirus vaccination: Recommendations of the Advisory committee on immunization practices (ACIP). *MMWR Recomm Rep* 63:1-30.
- [22] Drolet M, É B, Pérez N, Brisson M. (2019). Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: updated systematic review and meta-analysis. *Lancet.* 394:497-509. doi:10.1016/S0140-6736(19)30298-3.
- [23] Akkour k, Alghuson L, Benabdelkamel H, Alhalal H, Alayed N, AlQarni A, Arafah M (2021) Cervical Cancer And Human Papillomavirus Awareness among Women in Saudi Arabia *Medicina*, 57.1373.