

## RESEARCH ARTICLE

# Acceptability of Human Papilloma Virus Vaccination among Women in the United Arab Emirates

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### Abstract

**Background:** Human papilloma virus (HPV) is a common sexually transmitted infectious agent. It is estimated that 10% of all women worldwide are infected with HPV, that is some 660 million each year. HPV vaccination has a reported efficacy of more than 98% for protection against infection in females. In 2008 the Abu Dhabi Health Authority in the United Arab Emirates (UAE) introduced free HPV vaccination for all eligible schoolgirls in both public and private schools. **Methods:** A cross-sectional study of 640 women aged 18-50 years in the Emirate of Abu Dhabi in UAE from April 2012 to October 2012 was conducted. **Results:** Thirty-seven percent of the women in our sample had heard about HPV vaccination, and 80% of these would consider getting vaccinated themselves, and 87% would recommend vaccination to relatives or friends. Most women in the study (69%) had a favorable opinion about the vaccine. Only 17% of the women felt it might not be culturally acceptable, and 1% felt that there might be religious objections to HPV vaccination. Vaccine safety and recommendation by a doctor (36% each) were the factors identified most frequently by our sample of women which would enhance the uptake of the HPV vaccination. **Conclusions:** Knowledge about HPV vaccination among women in our sample was below average (37%); however, 80% of those who had heard about HPV vaccination were willing to be vaccinated themselves, and 87% would recommend vaccination to relatives and friends.

**Keywords:** HPV infection - HPV vaccine - cervical cancer - women - United Arab Emirates

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### Introduction

Human papilloma virus (HPV) is a common sexually transmitted infection, and it is estimated that 10% of all women are infected with this virus. In most women the infection clears spontaneously without treatment; however, in 10% to 15% the infection persists. These persistent infections can predispose women to precancerous and cancerous lesions. Infection by HPV causes nearly all cases of cervical cancers, 80% of anal cancers (Hoots et al., 2009), 60% to 8% of vaginal cancers, 40% of vulvar cancers (Smith et al., 2009), and 20% to 70% of head and neck cancers (D'Souza and Kreimer et al., 2007). Furthermore 100% of genital warts are caused by HPV (Chang et al., 2013).

The burden of HPV infection is huge. The half million cases of cervical cancer diagnosed each year worldwide are just the tip of the iceberg. Each year 10 million cases of high-grade HPV-related precancerous lesion and 30 million cases of low-grade HPV-related lesion are diagnosed worldwide. In addition, WHO estimates that 30 million people get genital warts each year. Overall 660 million people per year are infected with HPV worldwide.

Gardasil® (Merck and Co., Whitehouse Station, NJ,

USA), a quadrivalent HPV vaccine containing virus-like particles (VLP) of types 6, 11, 16 and 18, was the first cancer vaccine to be approved by the Food and Drug Administration (FDA) in the USA (in 2006) against HPV. This was followed soon after by the approval of Cervarix® (GlaxoSmithKline Biologicals, Rixensart, Belgium), a bivalent HPV vaccine containing VLP of types 16 and 18. Both vaccines have a reported efficacy of more than 98% for protection against cervical cancer in females (Schiller et al., 2012). However, Gardasil is licensed for protection against lesions other than cervical cancer, such as vaginal and vulvar intraepithelial neoplasias and genital warts. HPV vaccination has been now introduced in more than 150 countries worldwide.

In 2008 the Abu Dhabi Health Authority of the United Arab Emirates (UAE) introduced free HPV vaccination for all eligible schoolgirls in both public and private schools, regardless of whether they are nationals or not. Abu Dhabi thereby became the first state in the Middle East to introduce HPV vaccination. The health authority of Abu Dhabi State chose Gardasil for its vaccination program.

Nonetheless, the school-based HPV vaccination program in Abu Dhabi faced many challenges that have

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**Table 1. Sociodemographic Characteristics of the Study Participants (n=640)**

	Number (%)
Age (mean±SD)	32.41±8.246
Nationality	
National	275 (43.9%)
Non-national	352 (56.1%)
Family income	
Unknown	141 (22.0%)
<10000 AED	181 (28.3%)
>10000 AED	316 (49.4%)
Work status	
Employed outside the home	362 (56.6%)
Housewife	278 (43.4%)
Highest level of education	
Primary or below	46 (7.2%)
Secondary	198 (30.9%)
University level	395 (61.7%)
Marital status	
Single	178 (27.8%)
Ever married	462 (72.2%)
Age at first marriage (mean ± SD)	22.32±4.275
Husband's highest level of education	
Primary or below	47 (7.3%)
Secondary	145 (22.7%)
University level	262 (40.9%)

been addressed swiftly and efficiently. The uptake of vaccination was initially low (less than 60%), but has increased dramatically to more than 95% in the first quarter of 2013. This increase is probably a result, at least in part, of extensive awareness campaigns among the public and parents. However, the significant increase in HPV vaccination was seen only after training for health care providers, which enabled them to provide more consistent advice to the public about HPV vaccination. The objectives of this study were to assess the acceptability of HPV vaccination among women in the UAE and the factors that have affected acceptance.

## Materials and Methods

We conducted a cross-sectional study of 640 women aged 18-50 years in the Emirate of Abu Dhabi, UAE (population over 2 million), from April 2012 to October 2012. We obtained ethical approval from the Research Committee of the College of Medicine of United Arab Emirates University. A pretested questionnaire was used as the data collection tool after careful piloting. Individual face-to-face interviews were performed by three data collectors who were fluent in both English and Arabic. All the data collectors were given three days of rigorous training. Data collection was performed in both Arabic and English. The exclusion criteria were a previous diagnosis of cervical cancer, those who were not UAE residents, age younger than 18 or older than 50 years, and inability to speak Arabic or English. Convenience sampling was used to approach eligible women at homes, shopping malls, workplaces and community centers. No data were collected from hospitals or any other clinical settings.

We entered the data into Epi-data version 3.1 software and then exported data to SPSS version 19 software

**Table 2. Attitudes of Women Towards HPV Vaccination (n=640)**

	Number (%)
Have you ever heard of the HPV vaccine?	
No	401 (62.7%)
Yes	239 (37.3%)
Would you consider being vaccinated yourself? (n=239)	
No	49 (20.5%)
Yes	190 (79.5%)
Would you recommend HPV vaccination to your relatives or friends? (n=239)	
No	30 (12.6%)
Yes	209 (87.4%)
What do you think of HPV vaccination? (n=239)	
Good because it can prevent cervical cancer	164 (68.6%)
Good but not safe	29 (12.1%)
Good but not culturally acceptable	18 (7.5%)
Not good	2 (0.8%)
Others	4 (1.7%)
Don't know / No response	22 (9.2%)
In your opinion, what barriers might arise to the free introduction of HPV vaccination (n=239)	
No barriers	70 (29.3%)
Culturally unacceptable	42 (17.6%)
Unacceptable for religious reasons	2 (0.8%)
Women are usually little concerned about their health	74 (31.0%)
Others	40 (16.7%)
Don't know / No response	11 (4.6%)
If you were to recommend HPV vaccination, you would recommend it if: (n=239)	
It were safe	92 (38.5%)
It were recommended by my doctor	92 (38.5%)
Recommended by my family	3 (1.3%)
Recommended by health programs in the media	48 (20.1%)
Others	2 (0.8%)
No response	2 (0.8%)

**Table 3. Practices among Women Regarding HPV Vaccination (n=640)**

	Number (%)
Have you ever taken been vaccinated yourself against HPV?	
No	600 (93.8%)
Yes	40 (6.3%)
Has anyone in your family been vaccinated against HPV?	
No	571 (89.2%)
Yes	69 (10.8%)
Has your daughter been vaccinated against HPV?	
No	577 (90.2%)
Yes	63 (9.8%)
Have you ever had a Pap smear? (n=640)	
No	389 (60.8%)
Yes	251 (39.2%)

for analysis. Descriptive statistics were reported as the mean±standard deviation for age, and as the frequency and percentage for all other categorical variables. Two different models of binary logistic regressions analysis were built to identify the factors associated with positive attitude towards HPV vaccine and Practices regarding HPV vaccine.

## Results

Six hundred and sixty-two women were approached for the study. Twenty declined to participate and 2 were older than 50 years; a total of 640 women were included in our study (response rate 97%).

Table 1 shows the demographic information for the

**Table 4. Association of Demographic Factors with Attitude Towards HPV Infection**

		OR (95% CI)	P-value	AOR (95% CI)	P-value
Age		0.99 (0.970-1.011)	0.364		
Nationality	National	1		1	
	Non-national	0.71 (0.506-1.006)	0.054	0.55 (0.359-0.858)	0.008
Work status	Housewife	1			
	Employed outside the home	1.15 (0.815-1.620)	0.429		
Highest level of education	Primary or below	1			
	Secondary education	2.48 (1.051-5.858)	0.038		
	University level	2.49 (1.083-5.723)	0.032		
Marital status	Single	1			
	Ever Married	0.89 (0.612-1.295)	0.542		
	Husband's highest level of education			1	
	Primary or below	1		2.65 (1.091-6.455)	0.031
	Secondary education	0.41 (0.177-0.962)	0.04	2.796 (1.167-6.70)	0.021
	University level	1.06 (0.683-1.649)	0.79		

**Table 5. Association of Demographic Factors with Practices Regarding HPV Vaccination**

	OR (95% CI)	P-value
Age	0.89 (0.851-0.940)	0
Nationality		
	1	
	0.73 (0.380-1.392)	0.336
Working Status		
	1	
	0.68 (0.357-0.678)	0.235
Highest level of education		
	1	
	1.180 (0.383-3.634)	0.773
	0.443 (0.142-1.388)	0.162
Marital status		
	1	
	0.287 (0.150-0.550)	0
Husband's highest level of education		
	1	
	1.67 (0.352-7.894)	0.52
	0.44 (0.082-2.326)	0.332

women in our sample. Mean age was 32.4±8.2 years. Forty percent of the women were UAE nationals. Most of them were working women (57%). Nearly half of the women (49%) reported a total family income of more than 10 000 AED (2500 USD) per month. More than two thirds of the women (72%) were married, and mean age at the time of marriage was 22.3±4.3 years. Eighty percent of the married women in this study reported having one or more school-aged daughters.

Table 2 shows the women's knowledge and attitudes regarding HPV vaccination. Thirty-seven percent of our participants had heard about HPV vaccination. Eighty percent of those who had heard about vaccination said they would consider getting vaccinated themselves, and 87% said they would recommend vaccination to relatives or friends. Most of the women had a positive attitude towards vaccination (69%). Only 18% of our participants reported culture as a barrier to the uptake of HPV vaccination. More than one third of the women stated they would consider HPV vaccination if it were recommended by their doctor.

Table 3 summarizes the practices regarding HPV vaccination among our participants. Six percent of the women in this study had been vaccinated themselves, and 10% reported that at least one of their relatives had been vaccinated.

Table 4 shows the factors affecting women's attitudes

towards HPV vaccination. While adjusting for other factors, only nationality and Husband's education turn out to be significantly associated with positive attitude towards HPV vaccine. Being a non-national reduces the likelihood of positive attitude towards HPV vaccine by 45% (AOR 0.55; CI 0.359-0.858) whereas increasing husbands education increases the likelihood of positive attitude towards HPV vaccine.

Table 5 highlights the factors associated with practices regarding HPV vaccine i.e. if the woman is being vaccinated herself. On univariate analysis younger (OR 0.89; CI 0.851-0.940) and being single (OR 0.287; CI 0.150-0.550) were associated with greater chances of being vaccinated but upon multivariate analysis none of the demographic variables turns out to be associated with practices regarding HPV vaccine.

## Discussion

We investigated the acceptability and practices regarding HPV vaccination as well as factors that make women in the UAE more likely or less likely to get vaccinated against HPV. Six hundred and forty women from the Emirate of Abu Dhabi were interviewed face-to-face by three trained data collectors. Our response rate was good (97%); we believe this high response was achieved because we invested time in training our data collectors. All interviewers were women, and this made it easier for them to approach other women in the UAE community, which tends to be conservative. Forty four percent of the women in our sample were UAE nationals; this seemingly low figure is not surprising given the demographic composition of the general population, in which more than half of the individuals are expats. Mean age of the women in this study was 32.4±8.2 years, and mean age at first marriage was 22.3±4.3 years. The UAE is one of the wealthiest countries in the world: nearly half of the women stated that their family income was more than 10 000 AED (2500 USD). More than half of the women (57%) were working women; this proportion may reflect the convenience sampling technique we used in lieu of random sampling. Most of the women in this study had a secondary (31%) or university-level education (57%). Their husband's level education mirrored that of our female participants. Our results for the demographic characteristics of the women in our sample of the female

population in the UAE were not substantially different from what has been found by similar studies in the Arabian Gulf region, where a significant percentage of society consists of expat professionals (Al Sairafi and Mohamed 2013).

More than one third of the women in this study (37%) had heard about HPV vaccination. This is better than the awareness about HPV vaccine which was detected in nearby countries like India (23%) (Shekhar et al., 2013). Eighty percent of those who had heard about vaccination stated they would consider getting vaccinated themselves, and 87% would recommend it to relatives and friends. The acceptability of HPV vaccination among the women in our UAE sample is similar to that reported in other studies from developed countries with established HPV vaccination programs (Haesebaert et al., 2012; Molokwu et al., 2013), and much higher than the acceptability rates reported from less developed countries (Bair et al., 2008; Phan et al., 2012). Our study also shows that the acceptability of HPV vaccination in the UAE is better than in other Islamic countries such as Turkey, where acceptability ranges between 12% (Durusoy et al., 2010) and 44% (Kilic et al., 2012).

Most of the women who had heard about the HPV vaccination viewed it in a positive light (69%), citing its ability to prevent cervical cancer as their main reason. Few women expressed concerns about the HPV vaccine because they felt it might not be safe (12%) or felt it might be unacceptable for cultural reasons (8%). Only 1% had a clearly negative opinion about vaccination. This reflects a positive attitude towards HPV vaccination in a generally conservative community. In a study carried out among female university students in Nigeria, only 58% of the participants who had heard of HPV vaccination were willing to get vaccinated themselves (Makwe et al., 2012). A study from Mexico reported a significant decrease in vaccine acceptability when women had to pay for vaccination (Sanchez Anguiano et al., 2013). Because vaccination is provided free of charge in UAE for eligible women, we did not enquire about the effect of cost on attitudes towards HPV vaccination.

The main barrier to HPV vaccination in the UAE, according to our participants, was the fact that women are usually not very concerned about their own health (31%). Seventeen percent of the women in our sample thought it might not be culturally acceptable, and only 1% thought that there might be religious objections to HPV vaccination because it might lead to premature or inappropriate discussions of sexual activity. It is encouraging that neither cultural nor religious considerations were found to be major barriers to HPV vaccination in the UAE community; this is no different from the findings of other studies in western communities (Hodge et al., 2011).

According to study participants, vaccine safety and recommendation by a doctor (36% each) were the factors most likely to enhance the recommendation of HPV vaccination by the women in our sample. Our four years' experience with HPV vaccine in Abu Dhabi (Quadrivalent HPV vaccine) showed no any major side effect of the vaccine (Ortashi et al., 2012). These two factors were also shown to be the main factors associated with increased

uptake of HPV vaccination in a large systematic review and meta-analysis conducted at the Faculty of Social Work, University of Toronto (Newman et al., 2013) as well as by other studies (Ghojzadeh et al., 2012; Gence et al., 2013). Our experience in Abu Dhabi shows that the two factors most clearly associated with the successful introduction of HPV vaccination were training for doctors on how to provide the right advice about vaccination, and addressing public fears about vaccine safety.

Forty women in our sample (6%) had been vaccinated against HPV at the time of the study, and 10% reported that one of their daughters had been vaccinated. More than one third (39%) of the women in our study reported that they had had one or more cervical Pap smear tests in the past. We believe the rate of cervical screening uptake by the women in our sample represents a significant improvement compared to previous studies that reported uptake rates between 1% and 10% (Al Eyd and Shaik 2012).

We found that being a national and increasing husband's education were associated with positive attitude towards HPV vaccine. This may be a reflection of the nation specific trend, since in Abu Dhabi this vaccine is free for all the national hence increasing the uptake in national population. Also, in most cases women do not opt for vaccination unless their husband's allow for it. Increasing husband's education may result in better acceptability of vaccine by husband's resulting in better attitudes by females as well. Interestingly, most other similar studies reported a significant association between better education and income and willingness to be vaccinated against HPV (Al-Naggar, Bobryshev et al., 2012; Phan et al., 2012). Our results might reflect, in part, the use of a convenience sampling technique. However, among the women in our study, young age and being single were associated with a greater likelihood of having HPV vaccination themselves ( $p < 0.000$ ). This finding is in line with the efficacy of HPV vaccine which is only recommended for women younger than 26 years and single women.

The main strengths of our study are the fact that we investigated the acceptability of the HPV vaccination in an as yet unstudied population, and used face-to-face interviews to obtain our data. Moreover, our sample size was large and the response rate was very good. The main limitation of this study is the use of convenience sampling rather than random sampling.

In conclusion, more than one third of the women who participated in this study (37%) had some knowledge of HPV vaccination. Encouragingly, 80% of those who had heard about HPV vaccination were willing to be vaccinated themselves, and 87% would recommend vaccination to relatives and friends. Our results suggest that there are no significant cultural or religious barriers to HPV vaccination in the UAE. Vaccine safety and recommendation by a doctor (36% each) were the factors most likely to enhance the uptake of HPV vaccination in our sample of women. We found no significant relationship between any of the demographic factors we considered and HPV vaccine acceptability. However, older age and being married were associated with a greater likelihood of being vaccinated against HPV.

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