

Research Paper

## Influenza Vaccination: Healthcare Workers Attitude in Three Middle East Countries

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Received: 2010.06.30; Accepted: 2010.09.07; Published: 2010.09.21

### Abstract

**Background:** Healthcare workers (HCWs) pose a potential risk of transmitting communicable diseases in the hospital settings where they usually work. This study aims to determine the current influenza vaccination rates among HCWs in three Middle East countries namely United Arab Emirates (UAE), Kuwait and Oman, and also to identify the different variables associated with the noncompliance of HCWs to the recommendations of the Advisory Committee on Immunization Practices (ACIP) set in those countries. **Methods:** 1500 questionnaires were distributed to health care workers in the three countries during the period of July-October 2009. **Results:** Among 993 respondents, the vaccination rate was 24.7%, 67.2% and 46.4% in UAE, Kuwait and Oman, respectively. The different motivating factors that influenced the health care workers to take the vaccine was assessed and found that the most common factor that influenced their decision to take the vaccine was for their self protection (59%). On the other hand, the most common reason that discouraged HCWs to take the vaccine was "lack of time" as reported by 31.8% of the respondents. Other reasons for not taking the vaccine were unawareness of vaccine availability (29.4%), unavailability of vaccine (25.4%), doubts about vaccine efficacy (24.9%), lack of information about importance (20.1%) and concerns about its side effects (17.3%). **Conclusions:** influenza immunization by healthcare workers in the studied countries was suboptimal which could be improved by setting different interventions and educational programs to increase vaccination acceptance among HCWs.

Key words: Influenza, healthcare workers, vaccination

## INTRODUCTION

Healthcare workers (HCWs) pose a potential risk of transmitting communicable diseases in the hospital settings where they usually work.<sup>1</sup> Healthy individuals who are infected with influenza virus, including those with subclinical infections, can transmit influenza virus to other individuals who are at higher risk of complications from influenza<sup>2</sup> i.e. elderly and immune-compromised patients. As these patients belong to the risk groups, they must be vac-

inated against influenza. Vaccination rates among these groups vary widely among countries and even if vaccinated, it is reported that the efficacy of influenza vaccination are lower than that of younger adults which necessitates their indirect protection against influenza infections through vaccinating HCWs.<sup>3</sup>

Influenza vaccination of HCW reduces the risk of infection, influenza-like-illness and absenteeism among staff<sup>4</sup> and appears to prevent nosocomial in-

fections and associated morbidity and mortality among their patients.<sup>5</sup> For these reasons, influenza vaccination of HCWs is recommended by The World Health Organization (WHO), US Center for Disease Control and Prevention (CDC) and the immunization guidelines set by many countries to prevent the transmission of influenza virus from HCWs to patients.<sup>6</sup>

It is reported that there is a low uptake of influenza vaccination among HCWs despite the availability of immunization guidelines in many countries.<sup>7,8</sup> In the US for example, the vaccination rate among HCWs was only 43 % in 2005.<sup>8</sup>

Most of the Middle East countries adopt the recommendations and guidelines set by the international health agencies and provide vaccination programs to all HCWs against influenza virus both seasonal and pandemic. In the United Arab Emirates for example, in 2009, the pandemic influenza vaccines were distributed to all health care facilities and were available free of charge to the most vulnerable group based on priorities as follow; pilgrims, adults with chronic diseases, Health care workers who are in direct contact with patients with the priority for emergency room (ER), Intensive care unit (ICU), outpatient clinics and Primary health centers (PHC) healthcare workers.<sup>9</sup> However, the rate of influenza immunization among HCWs and barriers to influenza vaccinations are not fully addressed in the Middle East countries.

The purpose of the present study is to determine the current vaccination rates of HCWs in three Gulf countries: United Arab Emirates (UAE), Kuwait and Oman and also, to identify the different variables associated with the noncompliance of HCWs to the recommendations of the Advisory Committee on Immunization Practices (ACIP) set in these countries. The study intends to aid the regulatory bodies to implement effective interventions that would raise the rate of influenza immunization among HCWs.

## METHODS

1500 questionnaires were either personally distributed to HCWs or through their Health Care Facility (HCF) administrative channels by internal email or mail. The questionnaires were randomly distributed in pre-selected health care facilities i.e. three main hospitals, five polyclinics and medical centers in each country during the period of July-October 2009.

The questionnaire was delivered to the study populations; nurses working in ICU, pediatrics, geriatrics, acute medical care, gynecology and emergency departments; doctors, GPs, nephrologists, dentists, pediatricians and allied health care profes-

sionals i.e. radiographers, laboratory technicians and administrators.

Participants were given a brief introduction on the aim of the study, instructions on how to complete the survey and on how to return the completed forms. A period of one week was allowed for submitting the completed questionnaire, so as to ensure maximum participation of staff working in different shifts.

The questionnaire assessed HCWs uptake of influenza vaccination, reasons for vaccine uptake for vaccinated workers, and reasons for vaccination refusal for those who had declined taking the vaccine. The questionnaire composed of two parts; Part 1 addressed the demographic information of the participants, history of influenza like symptoms (frequency), absence from work due to influenza illness, frequency of receiving vaccination (if taken on regular basis), participants' knowledge of Centre of Disease Control (CDC) recommendations on seasonal influenza. Part 2 comprised of subdivisions, the first group of questions were addressed to those who had received the vaccine and enquired about reasons for taking the vaccine, time of vaccine administration and whether vaccine intake was beneficial.

The second group of questions were addressed to those who did not receive the influenza vaccination, and assessing different factors that might have inhibited their influenza vaccine uptake.

The study protocol was approved by the Research and Ethics Committee at Dubai Pharmacy College and approval for distributing the questionnaire was obtained from the administration of each health care facility (HCF) participated in the survey. The study protocol was also approved by internal committees of the participated health care facilities.

## Data Analysis

Data were entered and analyzed using SPSS software version 17; (SPSS®, Inc, Chicago, IL). Statistical analyses were performed using  $\chi^2$  tests for comparison between bivariate variables. Multivariate logistic-regression analysis was conducted to examine the associations between the outcome and all independent variables.

## RESULTS

Of the 1500 distributed questionnaires, 993 HCWs completed and returned the questionnaire with a total response rate of 66.2% in the three Middle East countries with the highest response rate from Kuwait; where 300 questionnaires were distributed and 232 (77.3%) completed the questionnaire. In Oman, 600 questionnaires were distributed and 360 (60%) completed the survey. In UAE, 691 questionnaires were

distributed and 401(58%) had completed and returned the survey. Approximately, seventy percent of the respondents were in the age range of 25- 45 years with the majority of the respondents being female (65.4%). The majority of the participants (66.5%) were professional staff. Data on the demographic information of participants are summarized in Table 1.

The study results showed that a total of 42.5% of all the respondents self reported influenza vaccination in the three countries. There was a statistically significant difference in the rate of vaccination among participants in the three countries (p-value <0.0001) with the highest vaccination rate in Kuwait (67.2%) compared to 46.4% in Oman and only 24.7% in UAE.

A small proportion of the respondents reported that they got influenza like symptoms on regular basis (11.6%) and the majority of the participants reported that they got it rarely (53.0%). When the respondents were asked about their awareness of the CDC recommendations for influenza vaccination, around fifty one percent of the respondents reported that they are aware of the CDC recommendations regarding immunization against seasonal influenza. Data are summarized in table 1.

The association between the respondents' characteristics and the vaccination status were tested to identify the different variables associated with the likelihood of vaccination against influenza among

HCWs. The data are summarized in table 2. There was no significant association between HCWs age and the vaccination status in both UAE and Kuwait with a p-value > 0.05 ( $\chi^2$  test) with highest vaccination rate being within the age range of > 45 years (32.2%) in UAE and within the age range of 36-45 years of age (69.5%) in Kuwait. In Oman, there was a significant difference in the vaccination rate among the different age groups ( $P = 0.005$ ) with the age range of 36-45 years of age (56.3%) having the highest vaccination rate. The lowest vaccination rate was within the age range below 25 years of age (25.5%).

Results also showed that gender does not have any statistically significant effect on the vaccination rate of the participants with a p-value = 0.05 ( $\chi^2$  test) in the three participated countries.

The attitude of HCWs' were also analyzed to see if their decision to take influenza vaccination were in any way influenced by their previous history of infection with influenza like symptoms. Results from UAE and Kuwait showed that there is no association between respondents' previous history of influenza illness and their vaccination status (p-value > 0.05,  $\chi^2$  test) in fact in Oman, the highest vaccination rate (66.4%) was obtained for individuals who never got influenza like symptoms. Multivariate analysis of the results showed that having history of influenza illness was less likely to occur in the vaccinated group in Oman (OR=0.662). Data are shown in table 2.

**Table 1.** Characteristics of respondent to the influenza vaccine survey of health care workers (\*\*: Significance level < 0.005)

Character		Country			
		UAE n (%)	Kuwait n (%)	Oman n (%)	Total n (%)
Age	<25yrs	31 (7.7)	3 (1.6)	47 (13.1)	79 (8.0)
	25-35yrs	163 (40.6)	18 (7.8)	170 (47.2)	351 (35.3)
	36-45yrs	120 (29.9)	141 (60.7)	87 (24.2)	350 (35.2)
	>45yrs	87 (21.7)	70 (30.2)	56 (15.6)	213 (21.5)
Gender	Male	115 (28.8)	107 (46.1)	122 (33.9)	344 (34.6)
	Female	286 (71.2)	125 (53.9)	238 (66.1)	649 (65.4)
Professional group	Professionals	224 (55.9)	182 (78.4)	254 (70.6)	660 (66.5)
	Paramedic	103 (25.7)	43 (18.5)	46 (12.8)	192 (19.3)
	Other	74 (18.5)	7 (3.0)	60 (16.7)	141 (14.2)
Previous history of Influenza	Never	160 (39.9)	76 (32.8)	116 (32.2)	352 (35.4)
	Regularly	41 (10.2)	33 (14.2)	41 (11.4)	115 (11.6)
	Rarely	200 (49.9)	123 (53.0)	203 (56.4)	526 (53.0)
Awareness of CDC recommendation	Yes	195 (48.6)	110 (47.4)	177 (49.2)	482 (48.5)
	No	206 (51.4)	122 (52.6)	183 (50.8)	511 (51.5)
Vaccination	Vaccinated	99 (24.7)	156 (67.2)	167 (46.4)	422 (42.5)**
Total		401	232	360	993

**Table 2.** Bivariate analysis of association between vaccination status and respondent characteristics and multivariate analysis of likelihood of vaccination.

Character		UAE (%)			Kuwait (%)			Oman (%)			OR (95%CI)
		Vaccinated	Non-vaccinated	Bivariate P	Vaccinated	Non-vaccinated	Bivariate P	Vaccinated	non-vaccinated	Bivariate P	
Age	<25	13	87.1		33.3	66.7		25.5	74.5		0.788 (0.614-1.011)
	25-35	22.1	78		50	50		44.7	55.3		
	36-45	25.8	74.2		69.5	30.5		56.3	43.7		
	>45	32.2	67.8	0.131	65.7	34.3	0.326	53.6	46.4	0.005	
Gender	Male	29.6	70.4		62.6	37.4		48.4	51.6		
	Female	22.7	76.9	0.156	71.2	28.8	0.165	45.4	54.6	0.591	
Professional group	Professionals	26.3	73.7		75	25		50	50		
	Paramedic	25.2	74.8		70	30		34.8	65.2		
	Others	18.9	81.1	0.434	57.1	42.9	0.798	40	60	0.090	
Previous influenza history	Never	18.8	81.3		63.2	36.8		66.4	33.6		
	Regularly	24.4	75.6		63.6	36.4		51.2	48.8		
	Rarely	29.5	70.5	0.063	70.7	29.3	0.484	52.7	47.3	0.004	0.662 (0.519-0.844)
Working while sick	Yes	70.1	29.9		66	34		60.2	39.8		
	No	21.3	78.7	0.051	68.1	31.9	0.735	42	58	0.191	
Awareness of CDC recommendations	Yes	26.7	73.3		65.5	34.5		56.5	43.5		
	No	22.8	77.2	0.371	68.9	31.1	0.582	36.6	63.4	0.000	2.205 (1.407-3.456)

On the other hand, the study showed that influenza vaccinated healthcare workers often continue to work while getting sick with influenza illness compared to none vaccinated individuals. In UAE, there was a significant difference (p-value =0.05) observed between the vaccination status of the respondents who continue to work despite their infection with influenza (70.1%).

Participants' awareness of the CDC recommendations of vaccination against seasonal influenza were assessed which revealed that almost half of the participants (48.5%) were aware of these recommendations. Despite this fact, the vaccination rate was low in all the three countries; in UAE, only 26.7% of the vaccinated workers were aware of the CDC recommendations. In Oman, the majority of the vaccinated individuals (56.5%) were aware of the CDC recommendations and those HCWs were 2.2 times more likely to have been vaccinated than others. Data are summarized in table 2.

The different motivating factors that influenced the health care workers to take the vaccine was assessed and found that the most common factor that influenced their decision to take the vaccine was for their self protection (59%). 46.9% took the vaccine based on the recommendations set by their institutions and 45.5% of HCWs took the vaccine to protect their patients and other HCWs from getting infected with influenza virus. The motivating factors that influenced HCWs' decision to take influenza vaccine were similar in all the three countries. The only factor

that showed statistically significant difference among the three countries was accessibility of the concerned vaccine where 38.3% and 42.9% of the respondents in Oman and Kuwait respectively reported that they took the vaccine because it was easily accessible compared to (12.1%) in UAE (p-value= 0.049,  $\chi^2$  test). Data are summarized in Table 3.

On the other hand, self reported reasons among HCWs on refusal to take influenza vaccine were assessed and showed that the most common reason that discouraged HCWs to take the vaccine was "lack of time" as reported by 31.8% of the respondents. Other reasons for not taking the vaccine were unawareness of vaccine availability (29.4%), unavailability of vaccine (25.4%), doubts about vaccine efficacy (24.9%), lack of information about importance (20.1%) and concerns about its side effects (17.3%). Data is shown in table 4.

The most common reason for not taking the vaccine in UAE & Oman was the unawareness of vaccine availability (21.5% and 31.6%, respectively) while in Kuwait "lack of time" was the main reason for not being vaccinated (90.9%) among HCWs.

The most common reasons among HCWs for not taking the vaccine were similar in the three countries but there were statistically significant differences for some factors among the three countries. HCWs' apprehensions of experiencing side effects was more in UAE (19.5%) compared to 13.2% and 15.5% in Kuwait and Oman, respectively. Lack of time was extremely important factor as reported by the majority of res-

pondents from Kuwait (90.9%) to be the main reason for not taking the vaccine compared to 14.6% and 19.7% in UAE and Oman, respectively. Another factor was HCWs doubts regarding vaccine efficacy as reported in Kuwait by 56.6% of the respondents with a significant p-value < 0.05,  $\chi^2$  test compared to 20.9% and 18.7% in UAE and Oman, respectively. All other factors were of non-significant difference among the respondents from the three participated countries.

**Table 3.** Reasons for up-taking vaccine among health care workers in three countries.

Reasons	UAE %	Kuwait %	Oman %	Total %	Chi-square
Advanced age(>50)	8.1	6.4	4.8	6.1	0.845
Easy access to vaccination	12.1	42.9	38.3	40	0.049
Recommendations from guidelines	40.4	50	47.9	46.9	0.837
Reduce illness period	28.3	35.3	35.9	33.9	0.791
Benefits out-weigh risks of side effects	8.1	11.5	14.4	11.8	0.674
Self protection patients and workers	56.6	54.5	64.7	59	0.109
Protection	32.3	46.2	52.7	45.5	0.241
Influenza epidemic	25.2	28.8	24.0	26	0.912

**Table 4.** Reasons for not-taking vaccine among health care workers in three countries.

Reasons	UAE %	Kuwait %	Oman %	Total %	Chi-square
Side effects	19.5	13.2	15.5	17.3	0.000
Lack of time	14.6	90.9	19.7	31.8	0.000
Doubts about efficacy	20.9	56.6	18.7	24.9	0.016
Lack of information about importance	16.6	32.9	20.7	20.1	0.638
Unavailability of vaccine	19.5	44.7	26.9	25.4	0.930
Low risk of infection	13.6	26.3	11.4	14.5	0.125
Unaware of availability or access to vaccine	21.5	55.3	31.6	29.4	0.912
It transfer influenza virus	1.6	3.9	2.6	2.2	0.971
Financial reasons	4.3	9.2	3.1	4.6	0.393

## DISCUSSION

Influenza vaccination of HCWs is cost effective, reduces the productivity losses associated with influenza illness and minimizes the transmission of the disease from HCWs to their patients. Many studies prove the effectiveness of influenza vaccination in reducing illness absenteeism and improving health status among health care workers.<sup>10</sup>

The present study was conducted to assess the attitudes of HCWs toward influenza vaccination and the extent of uptake of vaccination among health care workers employed in hospitals and clinical settings in certain Gulf countries.

The results of the present study revealed that the vaccination rate in UAE (27%) was low compared to 46.4% in Oman and 67.2% in Kuwait. This low vaccination rate is comparable to findings reported from various studies done in different countries. In one study conducted in US hospital setting, the vaccination rate among HCWs working in the emergency department was 28%.<sup>11</sup> In another study done in Australia, the percentage of vaccine recipients among HCWs was only 22%. However, a similar study done in Saudi Arabia, another Gulf country, reported that almost half of HCW's who participated in the study were vaccinated regularly.<sup>12</sup>

The highest vaccination rate was reported in Kuwait (67.2%) despite the fact that almost half of the respondents in the three countries were aware of the CDC recommendations which indicate that more compliance to the CDC recommendations was the highest in Kuwait compare Oman and UAE.

There are several factors which may influence influenza vaccination acceptance among HCWs. Findings from the current study suggests that if a HCW gets vaccinated against influenza; he would do so more often for his self protection rather than to prevent the transmission of disease to the patients. This result is in consistence with other studies that identified the main reason for taking the vaccines by HCWs to be for self protection.<sup>12,13</sup> However, a study conducted in Australia revealed that the most important reason for vaccine uptake was to protect their patients against transmission of the disease, where almost three quarters of the participants identified patient protection to be the main reason for taking up the influenza vaccination.<sup>13</sup>

The study demonstrated that almost 51.5% of total participants did not take the vaccine even though they were updated on the CDC's recommendations with regard to influenza vaccination. This should invite the attention of concerned parties on the need to implement appropriate strategies intended to reduce vaccination rejection by HCWs.

The results from this study demonstrated that in UAE and Oman, the main reason for not taking the vaccine was the unawareness on the availability or limited access to the vaccine; while in Kuwait 90.9% of respondents attributed lack of time for not taking the vaccine. HCFs should facilitate easy access for HCWs to the influenza vaccines at their work place, which would increase the vaccination rate and subsequently contributing to improved compliance to the vaccination program.

There are several reasons for lack of vaccine uptake by HCWs which are numerically large and heterogeneously addressed in literature. These findings

by itself is important as it reveals the complexity of the situation and indicates that it is crucial to understand the barriers to vaccination which may be specific to a particular cultural setting and/or subgroups of HCWs.<sup>14,15</sup>

Previous history of influenza like symptoms was associated with HCWs' decision to take the vaccine in Oman where vaccinated individuals were less likely to have a history of influenza illness. This is an encouraging finding which should be considered by all HCWs to increase their vaccination acceptance for more self protection against influenza illness.

Professional health care organizations must develop internal policies and provide educational/ informational resources to support HCWs influenza immunization program. These resources must specifically address the benefits and safety of influenza vaccines as well as the potential adverse health consequences on themselves, their family members and patients, if infected with influenza illness. Regulatory bodies must organize different educational programs and vaccination campaigns to improve HCWs' awareness on influenza vaccination. To increase HCWs' compliance to influenza vaccination, HCFs should implement appropriate follow up and reminder systems which would be successful in increasing HCWs' compliance to vaccination. Previous studies reported that educational materials addressed to HCWs are very important in improving their awareness, however, multi-faceted interventions including sending messages, developing evidence based policies and consensus have been found to have a much bigger impact to change HCWs behavior.<sup>14,15</sup>

HCFs must also implement various other interventions to increase the vaccination rate. To maximize convenience and minimize the disruption of usual clinical activities, the ACIP recommends the following measures to increase vaccination acceptance among health care workers; the use of mobile carts to deliver the vaccine onsite to healthcare workers in their workplace, increase vaccine availability after regular daytime hours, and follow up vaccination programs early during the course of recognized community outbreaks.<sup>6</sup>

Many health care organizations in the studied countries had conducted various influenza immunization programs, but the impact of these programs on the vaccination rates had not been remarkable. A comprehensive, concerted joint effort is to be initiated by employers, health care institutions, voluntary organizations and regulatory authorities, to improve and sustain health care worker influenza vaccination rates at optimal levels.

## Limitations of the study

Despite the fact that the response rate was good the study has some limitations in respect to the small sample size approached according to participants' area of specialization in the studied countries. In addition, the questionnaire assessed self reported vaccination rate and are not based on chart review which may resulted in a biased over reported vaccination rate.

## CONCLUSION

In summary, the uptake of influenza immunization by healthcare workers in the studied countries namely UAE, Kuwait and Oman was suboptimal, which could be improved by setting different interventions and educational programs to increase awareness among health care workers on the benefits of vaccination. Understanding the barriers to and facilitators of influenza vaccine uptake by HCWs are also essential to overcome their low compliance. Furthermore, ensuring vaccines availability and accessibility, particularly at their work place are other significant factors that would improve the acceptance and compliance to the immunization program.

Vaccination acceptance rate could also be increased by conducting promotional campaigns with regular follow up and appropriate individual reminder systems such as an email alert or an intranet link that would display when and where influenza vaccination is available. Additionally, establishing internal policies and procedures for HCFs regarding vaccination recommendations is of great importance which would substantially influence HCWs behavior and contribute to improving their influenza vaccination uptake.

## ACKNOWLEDGMENT

The authors thank all participants in this study particularly Dr. Shajahan Abdu and the undergraduate students: Anfal Mahmoud, Hanan Salim, Fatma Al-Alawadi, Safa Saleh and Eman Khalil who contributed to this work.

## Conflict of Interest

We declare that there are no conflicts of interest for all of us.

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