

# Association between knowledge of influenza vaccine and vaccination status among general population attending primary health care centers in Al-Madinah, Saudi Arabia

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## ABSTRACT

**Background:** Influenza vaccination is essential for population health. However, despite its strong recommendation, studies indicated a low rate of vaccine uptake. This study aimed to explore knowledge and attitudes towards influenza vaccinations among the general population attending primary health care centers in Al-Madinah, Saudi Arabia. **Materials and Methods:** This cross-sectional study was conducted among 381 participants from four health care centers in Al-Madinah city. A validated self-administered questionnaire was used. It includes questions on sociodemographic variables, knowledge, attitude, and vaccine uptake. Chi square test and simple logistic regression test were used to assess association between vaccination status and study variables. **Results:** Mean (SD) age of participant was 37 (12.5) and age ranged from 18 to 65 years. The majority were male (64.6%). Three out of seven items were answered correctly by most of the participants. The majority were classified as not knowledgeable (53.5%). More than half have been vaccinated with influenza vaccine (58.3%). Factors associated with vaccination uptake were Age group ( $P < 0.05$ ), Marital status ( $P < 0.05$ ), education level ( $P < 0.05$ ) and Knowledge ( $P < 0.05$ ). **Conclusion:** The study showed poor knowledge and attitude toward influenza vaccination among general population but a relatively accepted rate of vaccine uptake. Vaccination uptake was associated with knowledge, marital status, education, and age. This study recommends implementation of educational programs to increase the awareness among the general population.

**Keywords:** Attitude, influenza vaccine, knowledge, Saudi Arabia, vaccine uptake

## Introduction

Influenza is a highly contagious respiratory illness that is caused by influenza virus.<sup>[1]</sup> Periodic and seasonal outbreaks cause about one million deaths worldwide.<sup>[2,3]</sup> Greater complications afflict vulnerable and immune-compromised individuals.<sup>[1,4,5]</sup>

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The influenza vaccine is considered the most effective strategy for preventing severe illness and complications associated with influenza infection.<sup>[6,7]</sup> In Saudi Arabia, the vaccine is provided free of charge in all the PHCs.<sup>[7]</sup> Literature highlighted potential reasons of vaccine hesitancy: misconceptions that vaccine causes influenza or vaccine is unsafe during pregnancy.<sup>[8,9]</sup> Similar misconceptions were prevalent among healthcare workers who were reluctant to receive vaccinations.<sup>[10,11]</sup> These reluctance was postulated to be attributed to low knowledge levels of vaccine.<sup>[8,12]</sup>

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This study aimed to explore knowledge and attitudes towards influenza vaccinations among the general population attending primary health clinics in Al-Madinah, Saudi Arabia.

## Materials and Methods

This cross-sectional study was conducted among 381 participants from four health care centers in Al-Madinah city. That health centers were selected randomly from 36 centers in the city. Al-Madinah is one of the main cities in Saudi Arabia with an estimated population of nearly 2 million.<sup>[13,14]</sup> The primary data were collected from participants visiting primary health care centers in Al-Madinah. Those who aged 18 or above were included in the study. The Epi-info program was used to calculate the sample size based on 95% CI plus and minus 5, proportion of 50% and significance level of 0.05.

A self-administered validated questionnaire was used.<sup>[8,12,15]</sup> The questionnaire was translated to Arabic by forward-backward technique and then was piloted among 20 participants. The questionnaire consists of 3 parts. The first part included questions on sociodemographic characteristics such as age, sex, marital status, educational level and history of chronic disease. The second part included seven questions on influenza vaccination knowledge, attitudes and one question about vaccination status. The questions of knowledge were answered either 'yes', 'no' or 'I don't know'. Each correct answer was given one point with a total of 7 points for all correct answers.

Data was analyzed by using SPSS software version 23. Categorical variables were described by frequency and percentage while continuous variables were described by mean  $\pm$  SD. Chi-squared test was used to assess the relationship between vaccination status and sociodemographic variables and knowledge status. Simple logistic regression analysis was used to obtain the OR in case of variables with more than two categories. Median was used as a cut-off point to categorize total knowledge score to good knowledge and poor knowledge. A score equal or above the median was considered as good knowledge and a score below the median was considered as poor knowledge of influenza vaccine.

The ethical approval for this study was obtained from the ethical committee for health research in Al-Madinah (18 April 2018). The objectives of the study were explained to the participants and confidentiality was assured. Participation was voluntary. A written consent was obtained from the participants.

## Results

### Socio-demographic characteristics and vaccination status

Mean (SD) age of participant was 37 (12.5) and age ranged from 18 to 65 years. The majority were male (64.6%), married (71.7%), and had a university degree (59.1%). About third of the participants had chronic disease (31.5%). More than half have been vaccinated with influenza vaccine (58.3%) [Table 1].

**Table 1: Socio-demographic characteristics of the participants**

Variable	Frequency (%)
Age (years)	
<30 (%)	123 (32.3)
30-49	189 (49.6)
>49	69 (18.1)
Gender	
Male	246 (64.6)
Female	135 (35.4)
Education level	
No education/primary school	21 (5.5)
Intermediate/secondary	135 (35.4)
University	225 (59.1)
Marital status	
Married	273 (71.7)
Not married	108 (28.3)
Chronic disease	
Yes	120 (31.5)
No	261 (68.5)

### Knowledge of influenza vaccination

Mean (SD) knowledge score was 3.2 (1.9) and knowledge score ranged from zero to seven. Three out of seven items were answered correctly by most of the participants. These items are "Influenza vaccine is safe and effective" (66.9%), "The best way to avoid the complications of influenza is by using influenza vaccine" (63%), "influenza vaccine is freely provided in every primary healthcare facility" (72.4%). However, for the remaining four items the majority showed poor knowledge [Table 2]. The majority were classified as not knowledgeable (53.5%) and 46.5% were classified as knowledgeable.

### Factors associated with vaccination status of the participants

Those aged less than 30 and those aged 30–40 were more likely to be vaccinated compared to those who aged more than 49 ( $P < 0.05$ ,  $P = 0.001$ , respectively). Those with university education were more likely to be vaccinated compared to those with school education ( $P = 0.001$ ). Married were more likely to be vaccinated compared to singles ( $P = 0.040$ ). Those who were knowledgeable were more likely to be vaccinated compared to those who were classified as not knowledgeable [Table 3].

## Discussion

Less than half of the total respondents' in our sample were knowledgeable about vaccines. This finding was consistent with a previous study from Jordan.<sup>[16]</sup> Most participant in this study believed that influenza vaccine was safe and effective, and the best way to avoid influenza complications was to receive the vaccine as recommended. Similar consistency was observed in a previous study from Saudi Arabia.<sup>[12]</sup> However, gaps in knowledge persist on the uptake of vaccine in chronic

**Table 2: Knowledge and attitude of influenza vaccination among participants**

Item	Correct answer	%	Wrong answer	%	I don't know	%
Influenza vaccine is safe and effective	255	66.9%	33	8.7%	93	24.4%
The best way to avoid the complications of influenza is by using influenza vaccine	240	63%	33	8.7%	108	28.3%
Influenza vaccine is recommended to be given to individuals with chronic disease	147	38.6%	54	14.2%	180	47.2%
Pregnant women can be vaccinated with influenza vaccine	108	28.3%	93	24.4%	180	47.2%
I can acquire influenza from the vaccine	99	26%	120	31.5%	162	42.5%
After getting the flu, vaccination in the same influenza season is not necessary	99	26%	102	26.8%	180	47.2%
Influenza vaccine is freely provided in every primary healthcare facility	276	72.4%	33	8.7%	72	18.9%

**Table 3: Factors associated with vaccination status of the participants**

Variable	Vaccination		OR	95% CI	P
	Yes n (%)	No n (%)			
Gender					
Male	141 (57.3)	105 (42.7)			
Female	81 (60.0)	54 (40.0)	0.9	0.58-1.37	0.611
Age group					
<30	60 (48.8)	63 (51.2)	1.2	0.68-2.2	0.480
30-49	132 (69.8)	57 (30.2)	3.0	1.7-5.3	<0.05
>49	30 (43.5)	39 (56.5)	1		0.001
Education					
School	75 (48.1)	81 (51.9)			
University	147 (65.3)	78 (34.7)	2.0	1.3-3.1	0.001
Marital status					
Married	168 (61.5)	105 (38.5)			
Not married	54 (50.0)	54 (50.0)	1.6	1.02-2.51	0.040
Chronic disease					
Yes	72 (60.0)	48 (40.0)			
No	150 (57.5)	111 (42.5)	1.1	0.715-1.72	0.642
Knowledge					
Knowledgeable	141 (79.7)	36 (20.3)	5.9	3.75-9.43	<0.05
Not Knowledgeable	81 (39.7)	123 (60.3)			

disease patients, consistent with a previous study from Saudi Arabia.<sup>[12]</sup> The apprehension that pregnant women could be vaccinated with influenza vaccine was minimal, consistent with the study conducted in Riyadh City, Saudi Arabia.<sup>[8]</sup> A factor that posed barrier towards vaccine uptake was the belief that one can acquire influenza from the vaccine. This result was consistent with a previous study from Jordan.<sup>[17]</sup> Discrepancies of knowledge levels in this study and previous investigations could be attributed to variations of the study tool utilized and the effectiveness of health promotional activities on vaccination programs across different geographical locations within or outside Saudi Arabia.

This study found that middle aged adults were more likely to get vaccinated as compared to older aged adults and this association was statistically significant. This finding was contrary to a previous study from China that found older adults were likely get vaccinated as compared to younger ones,<sup>[18]</sup> while a study from Jordan found no significant relationships between age and vaccinations.<sup>[16]</sup> Higher education level has been usually considered to be associated with vaccine uptake.<sup>[18]</sup> We found

that those having a university education were more likely to be vaccinated and this association was statistically significant. This finding was inconsistent with a study conducted in China<sup>[18]</sup> and Jordan.<sup>[16]</sup> Respondents being single were more likely to get vaccinated and this finding was statistically significant, being inconsistent with a previous study from Jordan.<sup>[16]</sup>

Respondents knowledgeable about vaccine uptake had almost six times the odds of being vaccinated as compared to respondents who were not knowledgeable and this finding was statistically significant. This finding was consistent with previous studies from Turkey<sup>[15]</sup> and Saudi Arabia.<sup>[8]</sup> It could be postulated that better knowledge will enhance better awareness on perceived benefits of vaccination, thus catalyzing greater intentions to get vaccinated. This study was limited by cross-sectional design which cannot assure causality between study variables.

In conclusion, this study showed poor knowledge and attitude toward influenza vaccination among general population attending primary health care centers in Madinah. It also showed gaps of knowledge and demonstrated major barriers regarding the influenza vaccine. These results suggest that we need to implement educational programs and increase the awareness among the general population particularly for those who are at increased risk for severe complications from influenza to improve their knowledge toward influenza vaccination and thus, achieve better vaccination rates.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed

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### Conflicts of interest

There are no conflicts of interest.

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