

ORIGINAL ARTICLE

# Awareness and attitude regarding influenza vaccine among public and health care providers in the eastern region of Saudi Arabia

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## ABSTRACT

**Background:** Influenza vaccination is the most efficient method of prevention of influenza virus infection and its complications. The study aims to identify the public awareness about the importance of influenza vaccines and investigate the barriers of refraining from the flu vaccine. The secondary aim was to measure the percent of individuals and health care providers who receive the vaccine and to show how health care providers can increase the awareness about influenza vaccine in their communities.

**Methodology:** A cross-sectional community-based study conducted in different regions in Saudi Arabia. Data were collected through a predesigned online disseminated questionnaire, including all the relevant questions needed to fulfill the study objectives.

**Results:** The study included 1,018 participants; only 35.6% of the participants had received the flu vaccine. Out of them, 42.2% take the vaccine annually and 62.1% don't have any side effects or immune reactions, while 31.2% take it at travel time for Hajj and Umrah. Only 41.9% of healthcare workers have received the vaccine, 50% of healthcare workers realize the importance of the influenza vaccine, whereas 59.2% said that awareness campaigns are the way to raise awareness about the flu vaccine. Only 30.9% of children received flu vaccine (22.1% of them receive it annually). Only 6.2% of vaccinated children had side effects.

**Conclusion:** In Saudi Arabia, a low coverage rate with influenza vaccine was found among the public or health-care workers. Healthcare workers realize the importance of the influenza vaccine and recommend awareness campaigns to raise public awareness about the flu vaccine.

**Keywords:** Influenza vaccine, public awareness, coverage rate, children, healthcare workers.

## Introduction

Human influenza disease is fundamentally the aftereffect of the contamination with influenza A and influenza B infections. Influenza infections cause the yearly human scourges, occasional, and pandemic [1]. Consistently, between 5% and 10% of grown-ups and 20%–30% of kids have symptomatic influenza ailment and 3 to 5 million people experience the ill effects of extreme influenza, prompting 250,000 to 500,000 passings [2]. Around 870,000 youngsters aged <5 years and around 300,000 kids aged <1 year are hospitalized every year everywhere throughout the world on account of influenza and 10%–

15% of kids need medicinal consideration for influenza-related diseases [3,4]. Infection with an influenza virus

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**Received:** 13 January 2020 | **Accepted:** 23 January 2020

can result in a sudden onset of fever, cough, rhinitis, malaise, headache, and sore throat followed by an incubation period of 1 to 3 days. The effectiveness of the vaccine depends on boosting the immune system against the serotypes included within it [5,6].

Vaccination is the primary strategy for anticipation and control of flu. The accomplishment of the vaccination relies on the advancement by the health laborers, similar to doctors, medical caretakers, drug specialists, and other health care experts. A legitimate comprehension of the immunization benefits is compulsory. Demoralizing the vaccination for minor reasons ought to be maintained a strategic distance [7].

The vaccine is recommended for any age. Pregnant women should be vaccinated against influenza at any stage of pregnancy. Also, it includes healthcare workers because they are more often exposed to influenza than the general population. Children under 2 years of age are recognized for vaccination because of a high burden of severe disease [8].

The genuine test in the primary strategy for anticipation and control of the flu infection is the antigenic drifts and moves. Yearly vaccination is the present suggestion because of waning immunity. A previous study aimed to determine the prevalence of influenza vaccination among healthcare providers in Saudi Arabia found that self-report of seasonal influenza vaccination uptake was 55.9% (65.3% for physicians, 55.9% for nurses, and 33.3% for other staff). The perceived risk of severity of influenza was 2.5 times more in the compliant group than that of the non-compliant group ( $p < 0.001$ , 95% CI: 1.4–4.4) [9].

Another study aimed to assess the knowledge and attitudes of Saudi nationals regarding seasonal influenza vaccinations reported that 26.96% of the members were sure that there were no contradictions between the flu immunization and other youth antibodies and 36.67% realized that people with ceaseless sicknesses ought to be given the regular flu immunization. On the other hand, just 123 of the members (9.48%) comprehended that pregnant ladies could be inoculated with the flu immunization [10].

## Subjects and Methods

A cross-sectional community-based study, conducted in different regions of Saudi Arabia from 1 June to 30 October 2019 among the general population of Saudi Arabia. Data were collected through a predesigned online disseminated questionnaire. The questionnaire included all the relevant questions needed to fulfill the study objectives. The questionnaire included inquiries about socio-demographic characteristics, DM, Asthma, and other chronic diseases among the studied population.

The questionnaire included questions regarding awareness about the completeness of the obligatory vaccination schedule, sources of information about vaccines and receiving the flu vaccine among the studied population,

causes of encouragement and causes of abstinence from taking the flu vaccine and if there were any side effects. The questionnaire also included questions regarding receiving the flu vaccine among health care workers, how should they participate in increasing the awareness of the public about the flu vaccine. The questionnaire included also questions regarding receiving the flu vaccine among children.

We utilized the Statistical Package for Social Sciences, version 22 (SPSS Inc., Chicago, IL) to analyze the study data. Descriptive statistics were employed. For risk factors, the chi-square test was used,  $p$ -value considered significant if less than 0.05.

## Results

Table 1 describes socio-demographic characteristics, DM, Asthma, and other chronic diseases among the studied population. About 42.3% of the studied population aged between 21 and 30 years old; 74.2% were females, 97.7% were Saudi, and 69.6% were highly educated. Only 3.5% had DM, 4.9% had asthma, 6.9% hypertension, and 2.3% had hypothyroidism.

Table 2 illustrates the obligatory vaccination schedule and receiving flu vaccine characteristics. Among the studied population, 79.8% completed the obligatory vaccination schedule, 29.0% were aware of completeness of vaccine, and 14.2% reported medical staff as a source of information about the vaccine. Only 35.6% have received the flu vaccine, out of them, 38.4% of them said that medical adviser or doctor advised and encouraged them to take the vaccine. About 42.2% take the vaccine annually, while 31.2% take it at travel time for Hajj and Umrah. Nearly, 27.9% of vaccinated participants had side effects or immune reaction and 16.9% needed hospitalization after receiving the vaccine.

Table 3 discusses receiving the flu vaccine among health care workers as only 41.9% of healthcare workers have received the vaccine, 50% of healthcare workers realize the importance of the influenza vaccine, and 59.2% said that awareness campaigns are the way to raise awareness about vaccines.

Table 4 discuss receiving the flu vaccine among children. About 76.1% of children completed the obligatory vaccination schedule. Only 30.9% of children received flu vaccine (22.1% of them receive it annually). Only 6.2% of vaccinated children had side effects.

Table 5 discusses the relationship between socio-demographic characteristics, DM, Asthma, and receiving the flu vaccine among the studied population. There was a significant correlation between receiving flu vaccine and sex, age group, marital status, nationality, and educational level.

## Discussion

Vaccination is viewed as perhaps the best accomplishment of public health. Vaccination programs have added to

**Table 1.** Socio-demographic characteristics, DM, Asthma and other chronic diseases among the studied population, KSA, 2019 (N = 1,018).

	Frequency	Percent
Age group		
<21	292	28.7
21–30	431	42.3
31–40	158	15.5
41–50	87	8.5
>50	50	4.9
Sex		
Female	755	74.2
Male	263	25.8
Nationality		
Saudi	995	97.7
Non-Saudi	23	2.3
Educational level		
Basic	46	4.5
University or more	709	69.6
Secondary	263	25.8
Marital status		
Widow/ Divorced	19	0.8
Single	483	47.4
Married	516	50.7
DM		
No	982	96.5
Yes	36	3.5
Asthma		
No	968	95.1
Yes	50	4.9
Chronic diseases		
No	925	90.9
A decrease in thyroid secretions	23	2.3
Pulmonary embolism	1	0.1
H1N1	70	6.9
Malignancy	1	0.1

the decrease in mortality and the dismalness of different infectious diseases [11]. It is the most cost-effective mechanism for disease prevention that allows people to better protect themselves from specific bacteria and viruses [12].

Influenza is the most common vaccine-preventable disease and is recognized to cause serious illness, principally in the elderly, children aged <2 years, pregnant women, and people with underlying high-risk medical conditions [13]. Influenza vaccination is the most efficient method of prevention of influenza virus infection and its complications [14,15]. This is a cross-sectional study, conducted among 1,018 of the studied

**Table 2.** Awareness about the obligatory vaccination schedule, sources of information and receiving the flu vaccine among the studied population, KSA, 2019 (N = 1,018).

Complete the obligatory vaccination schedule		
No	206	20.2
Yes	812	79.8
Awareness about the completeness of vaccines		
No	723	71.0
Yes	295	29.0
Sources of information about vaccines		
Friends	49	4.8
Internet	89	8.7
TV	11	1.1
Medical staff	145	14.2
School	39	3.8
Have you received the flu vaccine?		
No	501	49.2
I do not know	155	15.2
Yes	362	35.6
If you answered "no" to the previous question, why not get one?		
Flu is a mild disease even though I don't need it	251	24.7
Due to side effects	113	11.1
I do not know	137	13.4
If yes, what encourages you to take the flu vaccine? (N = 362)		
A friend told me it was effective	65	17.9
My medical adviser or doctor advised me	139	38.4
Because it's free	44	12.1
Travel time for Hajj and Umrah	113	31.2
If yes, do you take flu vaccinations regularly? (N = 362)		
Annual	153	42.2
Before traveling	24	6.6
Every 4 years	32	8.8
Every 3 years	30	8.2
Every 2 years	51	14.1
Travel time for Hajj and Umrah	113	31.2
If yes, did you have side effects or immune reaction? (N = 362)		
No	361	62.1
Yes	101	27.9
If yes, do you need hospitalization after using the vaccine? (N = 362)		
No	301	38.1
Yes	61	16.9

population, Saudi Arabia. Regarding receiving flu vaccines, our study reported that only 35.6% of cases had received a flu vaccine. Out of them, 42.2% take vaccine

**Table 3.** Receiving the flu vaccine among health care workers, KSA, 2019 (N = 382).

If you are a health care worker have you received the flu vaccine?		
No	222	58.1
Yes	160	41.9
Do you realize the importance of the influenza vaccine?		
Probably	122	30.4
No	72	18.8
Yes	191	50.0
How should awareness be raised about vaccines?		
TV shows	64	16.7
Awareness campaigns	226	59.2
Publications	31	8.1
Social media	30	7.9
Seminars	27	7.1

**Table 4.** Receiving the flu vaccine among children, KSA, 2019 (N = 272).

If you are the mother of one or more children		
Sex of the child		
Female	135	49.6
Male	137	50.4
Complete the obligatory vaccination schedule		
No	65	23.9
Yes	207	76.1
Did your child receive the flu vaccine?		
No	188	69.1
Yes	84	30.9
If yes, do you receive it regularly?		
Annual	60	22.1
Every 2 years	19	7.0
Every 3 years	5	1.8
Did the child have side effects of the flu vaccine?		
No	67	93.8
Yes	17	6.2

annual and the majority of cases (62.1%) don't have side effects or immune reactions. In disagreement with our results, another study was conducted in Al-Madinah city among 381 participants reported that more than half have been vaccinated with the influenza vaccine (58.3%) [16]. Another study carried out among 1,298 Saudi nationals found that 44.5% of participants had been previously vaccinated at least once with the seasonal influenza vaccine [17]. In Italy, another study was conducted among 700 participants reported that 42.1% had received the influenza vaccine [18]. In China, another study carried out among 7,106 participants; 22.7% of participants reported having received a seasonal influenza vaccine [19]. In Jordan, another study conducted among 941 subjects reported only 20.4% of the participants have ever had the vaccine [20].

Regarding the relation between socio-demographic characteristics, DM, Asthma, and Receiving the flu vaccine among the studied population, our study found that there was a significant relation with sex, age, marital status, educational level, and nationality ( $p < 0.05$ ). However, no relation found with asthma and DM ( $p > 0.05$ ). Similar to our findings, another study reported that the vaccination uptake associated with age group, marital status, educational level ( $p < 0.05$ ) but not associated with chronic disease ( $p > 0.05$ ) [16]. In contrast to our results, in China, another study found that the seasonal influenza vaccination uptake did not associate with sex ( $p = 0.541$ ) or residence ( $p = 0.275$ ) but, it differs with age, higher education ( $p < 0.001$ ) as it decreased with increasing education levels and there was significant difference with a chronic illness ( $p < 0.001$ ) [19]. However, results

**Table 5.** The relationship between socio-demographic characteristics, DM, Asthma and Receiving the flu vaccine among the studied population, Saudi Arabia, 2019 (N = 1,018).

Variables	Response	Receiving the flu vaccine			Total (N = 1,018)	p-Value	
		No (n = 501)	Don't know (n = 155)	Yes (n = 362)			
Sex	Female	401	110	244	755	0.001	
		80.0%	71.0%	67.4%	74.2%		
	Male	100	45	118	263		
		20.0%	29.0%	32.6%	25.8%		
Age group	<21	115	94	83	292		0.002
		23.0%	60.6%	22.9%	28.7%		
	21-30	220	47	164	431		
		43.9%	30.3%	45.3%	42.3%		
	31-40	91	9	58	158		
		18.2%	5.8%	16.0%	15.5%		
41-50	51	2	34	87			
	10.2%	1.3%	9.4%	8.5%			
>50	24	3	23	50			
	4.8%	1.9%	6.4%	4.9%			
Marital status	Widow/divorced	9	0	10	19	0.001	
		1.8%	.0%	2.8%	1.9%		
	Single	219	111	153	483		
		43.7%	71.6%	42.3%	47.4%		
Married	273	44	199	516			
	54.5%	28.4%	55.0%	50.7%			
Educational level	University or more	375	73	261	709	0.002	
		74.9%	47.1%	72.1%	69.6%		
	Secondary	106	71	86	263		
		21.2%	45.8%	23.8%	25.8%		
Basic	20	11	15	46			
	4.0%	7.1%	4.1%	4.5%			
Nationality	Saudi	492	146	357	995	0.005	
		98.2%	94.2%	98.6%	97.7%		
	Non Saudi	9	9	5	23		
		1.8%	5.8%	1.4%	2.3%		
Asthma	No	474	148	346	968	0.785	
		94.6%	95.5%	95.6%	95.1%		
	Yes	27	7	16	50		
		5.4%	4.5%	4.4%	4.9%		
DM	No	485	152	345	982	0.251	
		96.8%	98.1%	95.3%	96.5%		
	Yes	16	3	17	36		
		3.2%	1.9%	4.7%	3.5%		

from another study revealed that participants' practice of having a seasonal influenza vaccine was not linked with any of the sociodemographic characteristics studied except for the field of work [20].

Our study found that from the reason for not receiving a flu vaccine, the majority (24.7%) think that flu is a mild

disease even though and don't need a vaccine, 11.1% refused due to side effects, and 13.4% didn't know the reason. Another study found that from the reasons for not being vaccinated, the main reasons were fear of adverse effects (24.9%), lack of recommendation from physician (24.2%), beliefs that they were not at risk for



influenza (18.3%), and the notion that the vaccine is not useful (14%) [18]. Another study reported that among the reasons for hesitate or even refuse vaccination, all subjects (100%) referred they aimed to avoid side effects [21].

Our study reported 38.4% of cases take the flu vaccine due to doctor advice, 31.2% due to travel time for Hajj and Umrah, 17.9% was told by friends that it was effective, and 12.1% take it because it's free. Similar to our results, another study reported that the majority of cases take the vaccine because it was recommended by physicians (74.9%) [18]. Also, another study found that the most commonly reported reason for having an influenza vaccine was in compliance with physician recommendations [20].

As regards sources of information about vaccines, 14.2% said medical staff, 8.7% internet, 4.8% friends, 3.8% school, and only 1.1% reported TV as a source of information about the vaccine. Another study found that the most frequently mentioned sources of information about vaccines were physicians (38.3%) and television/newspapers (32.3%) [18]. Another study showed that the most commonly used source was newspapers (52.1%) followed by health fairs (19.4%), while much lower proportions of participants used brochures (10.7%), physician office (9.6%) or TV (8.2%) [20]. Another study found that main information sources referred by study population were health professionals (75.3%), new media (17.5%), TV/radio (11.7%), and newspapers (11.7%), whereas 8.4% of participants recalled friends and/or relatives and 3.9% professional courses [21]. Also, another study reported that the main reported reference sources by participants were general practitioners (42.5%) and pediatricians (33.1%), followed by mass media (24.1%) and the internet (17.6%) [22].

According to receiving the flu vaccine among health care workers, we found that 41.9% of them had received the flu vaccine, half of the 50% realize the importance of influenza vaccine, and 59.2% of them think that awareness about vaccines can be raised by awareness campaigns followed by 16.7% for TV shows. Another study conducted by Al-shammari and Al-Fehaid [23], among a convenient sample of staff, found the influenza vaccination rate of 38%.

Among children in this study, we found that the majority 76.1% of them completes the obligatory vaccination schedule, only 30.9% received the flu vaccine and the majority 93.9% had no side effects of the flu vaccine.

## Conclusion

In Saudi Arabia, a low coverage rate with influenza vaccine was found among the public and healthcare workers. Healthcare workers realize the importance of the influenza vaccine and recommend awareness campaigns to raise public awareness about the flu vaccine.

## Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

## Funding

None.

## Consent for publication

Informed consent was obtained from all the participants.

## Ethical approval

The study was approved by the higher authorities of King Faisal University in Al-Ahsa, Saudi Arabia during the educational year 2017/2018.

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