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KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING THE INFLUENZA VACCINE AMONG ADULTS ATTENDING PRIMARY HEALTHCARE CLINICS IN DAMMAM, SAUDI ARABIA

Medicine

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ABSTRACT

The aim of this study was to measure the uptake of influenza vaccine and to assess knowledge, attitudes, and practices towards influenza vaccine among adults attending primary healthcare centres in Dammam, Saudi Arabia. The study was conducted at two primary healthcare centres in 2017 and 2018. Participants completed a self-administered questionnaire about the influenza vaccine. Of the 279 participants, 50.4% had received an influenza vaccine at least once, and 57% have good knowledge about the vaccine. The combined attitudes and practice score were higher among those who were more knowledgeable about the influenza vaccine. The most common sources of information were an awareness campaign (59.0%) and media (22.6%). Barriers to vaccination included a perception of not being at risk of influenza (18.6%), a lack of awareness of the vaccine (11.1%), and a fear of side effects (8.2%).

KEYWORDS

Influenza vaccine; influenza; vaccine hesitancy; knowledge, attitudes, and practice surveys

INTRODUCTION

Globally, influenza outbreaks lead to significant economic and social burdens and substantial morbidity and mortality among all age groups [1, 2]. The annual incidence ranges from 7% to 18% among the general population, peaking in winter. Attack rates during influenza epidemics are estimated to range from 20% to 50% [3]. The clinical presentation ranges from self-limited acute respiratory infections to serious illness requiring hospitalization [4].

Substantial efforts had been made to decrease the impact of seasonal influenza worldwide. The most effective preventive measure is the influenza vaccine [5]. Because influenza viruses undergo periodic changes in their envelopes, influenza vaccine is produced annually to match the circulating strains.

Multiple studies have demonstrated the effectiveness of influenza vaccine. The major benefits of influenza vaccines include the prevention of illness, reduction in absenteeism, and preventing hospitalization and influenza-related deaths [6–8]. The Saudi Thoracic Society guidelines recommend annual administration of influenza vaccine to all those over 6 months of age [3], and the US Centers for Disease Control (CDC) recommends that children between 6 months and 18 years be vaccinated annually against influenza [9]. Despite these recommendations, influenza vaccine hesitancy is common worldwide, with significant public health consequences [10]. Vaccine hesitancy is complex and context-specific, varying across time, place, and according to the type of vaccine. Reasons for vaccine hesitancy include factors such as complacency, convenience, and confidence (WHO) [11]. Previous studies in Saudi Arabia, have found that influenza vaccine uptake is low [12, 13]. In Saudi Arabia, most previous studies of influenza vaccine uptake have been among healthcare workers [14–16]. Only one study, conducted at a hospital in Riyadh, included people attending health facilities as well as healthcare workers [14].

This study aimed to determine influenza vaccination coverage in Damman, Saudi Arabia, reasons why people chose to be vaccinated, and reasons why people chose not to be vaccinated. The objectives of the study were to determine knowledge and attitudes toward the influenza vaccine; influenza vaccine uptake; and the preferred sources of information regarding the influenza vaccine among adults attending large public health centers in Damman.

METHODS

We conducted a survey in 2018-2019 in Dammam, in the Eastern Province in Saudi Arabia. Two of the nine primary healthcare centers (PHCs) run by the Ministry of Health, Gurnata PHC and Faisalyia PHC, were selected randomly from a list which provided by the Primary Healthcare Centers Directorate. The average monthly attendance was 3,400 at Gurnata PHC, and 1,932 at Faisalyia PHC. PHC attendees aged 18 years or above were eligible to participate. The main outcome was uptake of the influenza vaccine.

The sample size was calculated according to the equation:

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Where: n = population size, z = z-score, e = margin of error, and p = standard of deviation.

Based on previous similar study by Korani [13], the uptake of influenza vaccine was assumed to be 18.5%. Assuming a 95% confidence interval and 10% as margin of error, the estimated minimum sample size required was 248. The target sample size was set at 279 to compensate for incomplete questionnaires.

A self-administered questionnaire was developed for the study, adapted from a questionnaire used in a similar local study by Alabbad et al. [14]. The questionnaire was reformulated and then revised by two researchers to fit the study objectives, and piloted among 30 PHC attendees. The questionnaire included questions on participant demographics (age, sex, nationality, level of education, occupation), smoking status, and the presence of chronic disease. The questionnaire also included questions covering three main domains, namely knowledge, attitudes, and practices regarding the influenza vaccine. The measure of each domain was based on the responses to three or more questions. Knowledge was graded as “good” or “poor”, and the combination of attitudes and practices was graded as “positive” or “negative”, using cut-points based on the median score for the knowledge questions (66.6%) and the attitudes and practices questions (69.0%) among participants, respectively.

The questionnaire was distributed to a convenience sample of adults attending the PHCs. Data were entered, coded and analyzed using Statistical Package for Social Sciences (SPSS), Version 21 (IBM Corporation, Armonk, New York, USA). The results were reported as frequencies, percentages, means and ranges. Chi-square tests were used to measure relationships between dependent and independent variables. A p-value ≤0.05 was considered statistically significant.

The study was approved by Ministry of Health institutional review board and all participants provided informed consent. The Joint Program of Family and Community Medicine, and the managers at each PHC gave permission to conduct the study.

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RESULTS

A total of 279 people participated in the study. Their mean age was 33.3 years (standard deviation [SD]: ±10.54), with a range from 18–73 years. Participant characteristics are shown in Table 1.

Table 1. Participant Characteristics

Characteristic	Frequency	Percent
Age category (years)		
≤23	47	16.8
24–28	50	17.9
29–32	44	15.8
33–36	49	17.6
37–42	42	15.1
43-64	41	14.8
>65	4	1.4
Sex		
Male	134	48.0
Female	145	52.0
Nationality		
Saudi	243	87.1
Others	36	12.9
Educational level		
None	4	1.4
Primary	9	3.2
Intermediate	25	9.0
Secondary	107	38.4
Bachelor's degree	123	44.1
Higher	11	3.9
Occupation		
Student	36	12.9
Healthcare worker	17	6.1
Others	226	81.0
Smoker	61	21.9
Chronic disease		
Diabetes mellitus	29	10.4
Asthma	13	4.7
Cardiovascular disease	3	1.1
Malignancy	1	0.4
Other chronic disease	21	7.5
High-risk group*	88	31.5

* The high-risk group includes participants with chronic disease, healthcare workers, and participants aged ≥65 years

The majority of participants (83.9%) had heard of the influenza vaccine but only 40.6% had ever been vaccinated. Vaccine rejection was higher among females (66.9%) than males (50.7%) (p=0.006), and was higher among Saudis (62.6%) than non-Saudis (36 %) (p=0.03). In our study 32% of the participants classified as being in a high-risk group based on age, occupation, or chronic disease. Vaccine rejection among high-risk participants did not differ significantly from that of the other participants (46.5%) (p=0.32). Other demographic characteristics didn't show any significant difference regarding the vaccine coverage among the participants.

Among participants who had heard about the vaccine, the most common source of information was the Ministry of Health awareness campaign followed by media such as television and newspapers .

The majority of participants who had received information from the Ministry of Health campaign or medical staff reported that they trusted these sources of information (Table 2).

Table 2. Source Of Information About The Influenza Vaccine And Level Of Trust In The Information Source

Sources	Used as a source of information n (%)	Trust the source n (%)	Neither trust no distrust the source n (%)	Distrust the source n (%)
Campaign	81 (29.0)	57 (73)	22 (27.1)	2 (2.4)
Media	63 (22.6)	33 (52.3)	29 (46.0)	1 (1.6)
Internet	42 (15.1)	18 (42.8)	21 (50.0)	3 (7.1)
Healthcare providers	43 (15.4)	35 (81.3)	8 (18.6)	0 (0.0)
Individuals or groups	40 (14.3)	16 (40.0)	18 (45.0)	6 (15.0)

Participants' responses to questions about their knowledge of the influenza vaccine are shown in Table 3. Only 50.4 % stated that they believed that influenza vaccines were effective, and only 54.5% were aware that influenza vaccine should be given every year.

Table 3. Knowledge About The Influenza Vaccine

Knowledge question	n (%)
Do you think that the influenza vaccine can protect you from influenza, or make it milder?	
Strongly agree	37 (13.3)
Agree	103 (37.1)
Neutral	105 (37.6)
Disagree	27 (9.7)
Strongly disagree	6 (2.2)
Do you think that influenza vaccine is safe for pregnant women?	
Strongly agree	17 (6.1)
Agree	35 (12.5)
Neutral	168 (60.2)
Disagree	39 (14.0)
Strongly disagree	20 (7.2)
How frequently is influenza vaccine recommended for each individual?	
Once for life	34 (12.2)
Every year	152 (54.5)
Don't know	73 (26.2)
Whenever they need it or have a cold	20 (7.2)

Overall 57% of participants had a good knowledge about the influenza vaccine. The proportion of participants with a good knowledge was 88.2% among healthcare workers (p=0.02), 64.1% among participants with chronic disease or ≥65 years.(p=0.24)

Participants' responses to the questions on attitudes and practices are shown in Table 4. Only 40.5% reported that they had ever had an influenza vaccine and, of those who reported that they had ever had an influenza vaccine, only 38.1% reported that they had a vaccine every year.

Table 4. Attitudes And Practices Toward The Influenza Vaccine

Attitude and practice question	n (%)
Have you ever received an influenza vaccine?	114 (40.5)
How often do you have an influenza vaccine?*	
Only once	43 (38.1)
Every year	47 (42.0)
Every 2 years	12 (10.6)
Every 3 years	6 (5.3)
Whenever I need it or have cold	5 (4.4)
Are you planning to have an influenza vaccine regularly in the future, as recommended?	
Strongly agree	29 (10.4)
Agree	75 (26.9)
Neutral	103 (36.9)
Disagree	54 (19.4)
Strongly disagree	18 (6.5)
Do you advise others to take influenza vaccine as recommended?	
Strongly agree	44 (15.8)
Agree	110 (39.4)
Neutral	78 (28.0)
Disagree	39 (14.0)
Strongly disagree	8 (2.9)
Do you have a reason for vaccine rejection?	192 (68.8)

Of those who had ever received an influenza vaccine.

Overall 71% of participants had a positive attitudes and practices concerning the influenza vaccine. The proportion of participants with a

positive attitudes and practices was 82.3% among healthcare workers (p=0.04) ,76.1% among participants with chronic disease or ≥65 years.(p=0.36)

The reasons that participants gave for not having an influenza vaccine (vaccine hesitancy) are shown in Table 5.

Table 5. Reasons For Influenza Vaccine Hesitancy

Reason for influenza vaccine hesitancy	n (%)
It is painful.	17 (6.1)
I don't like having too many injections.	4 (1.4)
The medical staff did not recommend it to me	17 (6.1)
I am allergic to the vaccine.	0 (0.0)
I don't know where I can get the vaccine	12 (4.3)
I haven't heard of the vaccine before	31 (11.1)
My doctor or my friend advised me not to have a vaccine	17 (6.1)
I think that it is harmful	8 (2.9)
I think that it causes serious side effects.	23 (8.2)
I think that it doesn't have any benefits	11 (4.0)
I don't think I need it because I'm healthy.	52 (18.6)
Others	18 (6.5)

Those with a good knowledge were more likely to have good attitudes and practices (86.2%), compared to those with a poor knowledge (50.8%) (p<0.001). figure1

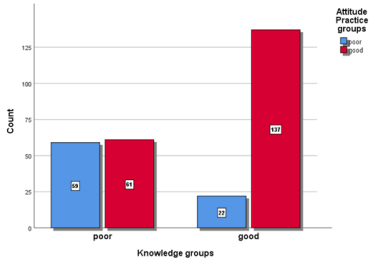

Figure 1 Attitudes and practices toward the influenza vaccine according to the level of knowledge about the influenza vaccine

DISCUSSION

This is the first study of influenza vaccine uptake, and the related knowledge, attitudes and practices in the general population of Damman in Saudi Arabia, and one of a few studies of the influenza vaccine in Saudi Arabia that included members of the general population in addition to healthcare professionals.

Our study revealed that the majority of the study participants had heard of the influenza vaccine, but that less than the half of them had ever been vaccinated against influenza. The study also revealed that vaccine uptake was correlated with beliefs about the effectiveness of the vaccine. This result is similar to that of another local study conducted in King Abdulaziz Medical City in Riyadh in 2017, which found an influenza vaccine uptake of 36.7% among people visiting the PHC [12]. However, another study conducted among attendees at a PHC in Makkah found a vaccine uptake of only 18.5%, even though the majority of participants stated that they believed that they were at risk of infection [13]. Studies conducted in several different countries, including Lebanon, Jordan, and the US, have also found low uptake of the influenza vaccine [16, 18, 19]. Even though the vaccine uptake was suboptimal in our study, it was higher than the studies conducted in Riyadh and Makkah. This may be due to recent efforts by the Ministry of Health to raise awareness concerning influenza vaccination by running an awareness campaign and displaying posters in health centers.

CDC strongly recommends annual influenza for high-risk groups [9]. including people with chronic disease, healthcare workers, and people aged >65 years. Our study did not find a difference in influenza vaccine coverage between participants who belonged to a high-risk category and the other participants. Studies done in Riyadh and Lebanon have also not found a significant difference in influenza vaccine coverage between patients with and without chronic disease [12, 18]. The low influenza vaccine uptake among participants in high-risk groups highlights the importance of encouraging all the high-risk groups to have an influenza vaccine annually [9].

In our study, we found that those with greater knowledge about the influenza vaccine were more likely to have been vaccinated against influenza. The study done in Riyadh also found that those with greater knowledge were significantly more likely to have been vaccinated against influenza [12]. Another study, conducted at a public university in New York State in the United States in 2013 to evaluate the predictors of low vaccine uptake, found that 71% of unvaccinated students expressed a willingness to be vaccinated after being informed about the importance of influenza vaccine [20].

In this study, we also found an association between having a good knowledge and a positive attitude toward the vaccine. Programs to increase knowledge about the influenza vaccine should target information sources that people trust. Among the study participants, the most common source of information were the awareness campaigns and media such as television and newspapers. Another local study found that healthcare providers, awareness campaigns, and media were of relatively equal importance as sources of information about the influenza vaccine [14]. The study done in Lebanon found that healthcare providers (physicians and pharmacists were important sources of information [18]. A study done in South Africa in 2017 found that physicians were one of the main factors influencing people to have an influenza vaccination [21]. Healthcare providers also play a key role in ensuring vaccine compliance, and it is a cost-effective measure to use healthcare workers to motivate people to be vaccinated [22]. In our study, only a small minority of participants mentioned healthcare providers as their source of information about the influenza vaccine. This may reflect insufficient patient education by healthcare providers regarding the importance of the influenza vaccine and correcting misconceptions about the vaccine. However, it is reassuring that most participants who had heard about the influenza vaccine from healthcare providers, trusted them as source of information.

In addition to the low vaccine uptake in or study, less than 40% of the participants stated that they planned to have regular influenza vaccinations in the future. The primary reasons that participants gave for vaccine hesitancy were that they believed that they do not need to be vaccinated because they were healthy; that they that they had not heard of the influenza vaccine; and a fear of side effects. The study done in Makkah found that the main reason for vaccine hesitancy was a fear of side effects [13]. In another study conducted in Germany, the most commonly stated reasons for not being vaccinated were a mistrust of the vaccine, and the perception that influenza is not dangerous (21%) [23].

The results of our study and these previous studies indicate that it is important to develop strategies that address reasons for vaccine hesitancy. A systemic review of studies published between 2007 and 2013 regarding public concerns toward the vaccine, concluded that strategies to increase vaccine uptake should be carefully designed according to the target population concerns [24]. In addition to the awareness campaign, new modes of communication (social media, online blogs) should be used to deliver formal messages to correct misconceptions about the vaccine, and systematic reminders should be sent to healthcare providers emphasizing the importance of patient education about the seasonal influenza vaccine. This, combined with announcements by the Ministry of Health during the influenza season, could contribute to addressing misconceptions and raising public awareness of the influenza vaccine.

The limitation of this study that it was conducted in only two PHCs out of 30 PHCs in Dammam, so our results may not be generalizable to the population of Dammam.

In conclusion, our study results revealed that seasonal influenza vaccination uptake was suboptimal, and that this was a reflection of low knowledge and widespread misconceptions about the influenza vaccine. Reasons for vaccine hesitancy included a perception of not being at risk of influenza, a fear of the side effects, and a lack of awareness about the vaccine. Beside to the role of the Ministry of Health, healthcare providers could play an important role in raising awareness and correcting misconceptions. This would contribute to raising knowledge and would have a positive effect on general attitudes and practices regarding seasonal influenza vaccination.

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