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Prevalence Of Influenza Immunization During Hajj Among Diabetic Patients Attending Primary Health Care Center In Makah At Saudi Arabia: A Cross-Sectional Study 2022

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ABSTRACT

Background:
Influenza is a seasonal epidemic with main symptoms that include fever, cough and muscle aches. Fever is a big distinguishing component between a cold and influenza. Some other common symptoms which may or may not be seen with a cold as well are headache, chills, loss of appetite, fatigue and sore throat. diabetes, influenza is a significant burden on the healthcare systems. A significant issue and a significant big health concern happen every year is looking how we could mitigate and manage it and obviously take the burden off the health care system. Diabetic patients, as other chronic diseases patients, could catch the influenza infection, which is a respiratory infection caused primarily by influenza A and Influenza B. Diabetes Mellitus (DM) is a major health problem worldwi[1]de. It is a number of metabolic disturbances that is characterized and identified by the presence of hyperglycemia in the absence of treatment. ***Aim of the study****: To assessment Prevalence of Influenza Immunization during Hajj among Diabetic Patients attending Primary Health Care Center in Makah Al-Mokarramah at Saudi Arabia 2022.* ***Methods****: A Cross-sectional analytical study was carried out in the city of Makah among diabetic patients during Hajj attending Primary Health Care Center during the October to December 2022, the Sample size patients participants. Our total participants were (300).* ***Results:*** *shows the majority of participant (39.5%) have average level of total attitude of diabetic patients towards seasonal influenza vaccination followed by (29.5%) of participant weak while Range(7-19) and Mean ±SD(13.065±3.822),* X^2*11.59 P=0.003.****Conclusion:*** *Undermining the effect of influenza and misconceptions on the effectiveness of the vaccine could much be improved by increasing awareness and knowledge, seasonal vaccination among diabetics in KSA is low. Level of knowledge and perception are the main barriers to vaccination. Health care provider's advice may be an important key predictor of previous influenza vaccination and*

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they should continue to educate and encourage all diabetics to get vaccinated for influenza at least once yearly.

Keywords: *prevalence, influenza, immunization, diabetic, PHC, Makah Al-Mokarramah*

Introduction

Diabetes Mellitus (DM) is a major health problem worldwide[1]. Influenza is a serious vaccine-preventable disease, ranked among the top 10 infectious diseases affecting the Canadian population.1 Influenza is a frequent cause of outbreaks in acute and long-term care facilities; approximately 3,500 Canadians, mostly seniors, are estimated to die from influenza or its complications annually.2,3 Immunization is one of the most effective tools to prevent influenza; despite national recommendations, only 32.5% of Canadians and 48.8% of Nova Scotians aged 12 or older received their annual influenza vaccine.[2]

Diabetes and influenza obviously is a big problem that diabetics are at a high risk of complications, everything from hospitalizations to death, and generally a lot of it is they have multiple core movement conditions, maybe Chronic Obstructive Pulmonary Disease (COPD), hypertension, renal disease, all of which can be exacerbated by an influenza infection.[3] More recent literature reported that people with diabetes are at an increased risk of Ischemic events, such as heart attacks and strokes[4]. Diabetic patients who get an influenza infection for about seven days post the infection, they are at a six times increased risk of having a myocardial infarction or a stroke and it is thought to be because of an abrupt increase in inflammation [5], ultimately leads to that increased risk of them potentially having a heart attack or a stroke [6]. In addition, some of the other reasons why people with diabetes are a little bit more at higher risks to develop influenza and having complications are because of the abnormal glucose metabolism[7]. So, having diabetes seems to cause a bit of a dysfunction in terms of our white blood cells, so affects the ability of the WBCs to collect up and swallow foreign invaders.

DM (Diabetes Mellitus) patients are considered a higher risk group to develop influenza infection, and this increases the risk of hospitalization. According to the American Diabetic Association (ADA), annual influenza vaccination for all individuals with diabetes recommended, because it is effective, safe, and mitigates influenza-related complications, hospitalizations, and deaths in these patients[8]

People with diabetes, even when well-managed, are at high risk for serious flu complications, often resulting in hospitalization and sometimes even death. Sinus infections and ear infections, Pneumonia, bronchitis, are examples of flu-related complications. Worldwide, these annual epidemics are estimated to result in about 3 to 5 million cases of severe illness and approximately 250 000 to 500 000 deaths.[9] In our country, seasonal outbreaks occur mainly during winter, while in tropical regions, influenza may occur throughout the year, causing outbreaks more irregularly.

However, to decrease this risk of influenza infection in DM patients, annual influenza vaccination of people with DM is recommended by WHO (World Health Organization), CDC (Centers for Disease Control and Prevention), and ADA. It is considered the most efficient method to prevent infection and severe outcomes caused by influenza viruses.[1,4,19]

Literature Review

A descriptive cross-sectional study published in Human Vaccines and Immuno-therapeutics journal at 2013. Jimenez-Trujillo, et al. conducted a study about (Influenza vaccination coverage rates among diabetes ≥ 50 years from 2003 to 2010 in Spain). They assess influenza vaccination status by a question (yes or no). The Influenza vaccination coverage among adults with diabetes in 2010 was 65.0% (95% CI: 62.1–67.7) compared with 41.2% (95% CI 40.0–42.4) for those without diabetes. In 2003, the vaccine uptake among adults with diabetes was 61.4% and in 2006, it was 63.8%. However, the levels of influenza vaccination coverage are below desirable levels among adults with diabetes in Spain [11].

In Saudi Arabia, MOH (Ministry of Health) recommends that international pilgrims be vaccinated against seasonal influenza with most recently available vaccines before arrival. Particularly those at increased risk of severe influenza disease including children aged over five years, pregnant women, the elderly, and individuals with pre-existing health conditions such as asthma, DM, chronic heart and lung diseases and HIV/AIDS infection[12]

In Saudi Arabia, Haridi et al (2017) reported that despite the high level of knowledge regarding influenza vaccination, there is a low level of practices among the Saudi community members. In a more recent study by El Khoury et al., (2015), the findings of the study revealed that there is a very low rate of influenza vaccination among Saudi community members, which highlights the urgent need for a comprehensive awareness campaign targeting different categories of the community. Despite the availability of different studies that assessed the level of knowledge, awareness and practices related to influenza vaccination in Saudi Arabia,[13,14]

There is no recent data investigation in Makah estimating the prevalence of influenza vaccination among DM patients. So, this study is conducted to assess the prevalence of influenza vaccination among DM patients.

Ministry of Health, 2021 reported that pointing out that influenza vaccination seasonality does not prevent infection with the emerging corona virus, but rather reduces the possibility of infection by a large percentage.[15] The results of the present study are similar to the findings of Abu-Rish et al., (2016) who found that Jordanian adults have a good level of knowledge about seasonal flu and vaccination. However, the context of the two studies is different as our study focused on adult diabetic patients.[16] On the other hand, the results of the present study are inconsistent with the findings reported by Olatunbosun et al., (2017) who found that South African diabetic patients had low level of knowledge regarding the seasonal flu and seasonal influenza vaccination. Furthermore, this high level of knowledge regarding seasonal flu and positive attitudes among diabetic patients towards seasonal flu vaccination might be referred to the activation of different communication channels to increase the diabetic patients' knowledge and awareness regarding seasonal flu vaccination. This is evidenced by the results indicated that physician's advice, fellow patient's advice, public awareness campaigns and other methods were the influencing factors that motivated the diabetic patients to take the seasonal flu vaccine.[17]

Another study carried on Spain, conducted a cross-sectional study in 2016, about (vaccination practices in patients with diabetes) involving 279 patients with diabetes attending a Primary Care Center. The prevalence of patients vaccinated for seasonal influenza was 40%. Regarding believes and attitudes for vaccination, a total of 67 (24%) of the patients did not believe in the effectiveness of the vaccination or feared side effects. However, there were only 4 (1%) patients who experienced mild adverse reactions to influenza vaccination.[18]

RATIONALE

Pneumonia is the most common complication of influenza that occurs. When the lungs become infected by bacteria then secondary bacterial pneumonia may occur .Other rarer complications may occur, such as spread of the virus to cause disease in the heart, muscles or brain. Influenza is one of the most common respiratory illnesses affecting people of all age groups worldwide. Those patients with chronic diseases including DM patients are at a higher risk for influenza and influenza-associated complications when compared with healthy individuals. Up to the researcher knowledge, there were no local studies of influenza vaccination among people with DM. Makah Al-Mokarramah was chosen because pilgrims come to Makah from all over the world every year to perform Hajj, which may lead to an increase in the prevalence of influenza.

Aim of the study

To assessment Prevalence of Influenza Immunization during Hajj among Diabetic Patients attending Primary Health Care Center in Makah Al-Mokarramah at Saudi Arabia 2022.

Objectives:

- To assessment Prevalence of Influenza Immunization during Hajj among Diabetic Patients attending Primary Health Care Center in Makah Al-Mokarramah at Saudi Arabia 2022.

Methodology

Study Design

A Cross-sectional analytical study

Study area

The study was carried out in the city of Makah Al-Mokarramah (the Holy capital of Saudi Arabia) which is located at the center of the Western Region of Saudi Arabia, contains a population around 1.578 million . It has a holy value for all Muslims worldwide who travel to it annually to perform Hajj and to visit the Holy Masjid and Kaaba towards which Muslims turn in prayers. The city has seven sectors of PHC divided into three inners and four outers (Al-Zahir, Al-Adel, Al-Kakyeea, Al-Sharaee, Al-Jamom, Al-Kamel, and Kolese). Each sector consists of a group of Primary Health Care Centers. The researcher is concerned with one of the inner PHC of Al-kakyeea sector called " Al-Zahir PHCC".

Study Population

The study was conducted among DM patients attending Al-Zahir PHCC in Makah Al-Mokarramah, during the period of study in 2022 .

Selection criteria:

A- Inclusion criteria:

- All adult DM patients.
- Both males and females.
- All nationalities.

Exclusion criteria:

- Age < 18
- DM with impaired cognitive functions

Sampling technique:

The researcher used Multi-stage random sampling technique, giving each sector code number from one to seven (1- Al-zahir, 2- Al-adel, 3- Al-kakyeea, 4- Al-sharaee, 5- Al-jamom,6- Al-kamel, 7- Al- Kolese). After that, by using random number generator, the minimum number was one, and the maximum was seven, the generation number was three which is Al-kakyeea sector. Then simple random sampling technique was applied to select the PHCC from Al-Kakyeea sector (1- Al-Kakyeea, 2- Al-Khaldya, 3- Al-Hejra,4- Al-Eskan,5- Al-Masflah, 6-Al-Nakash, 7-Alhilal Alahmer, 8-Al-Heglah, 9- Al-Hndaweeah, 10- Um-Alrakah, 11- Al-Khadhra) the given number was 4 " Al-Eskan PHCC". Also, convenience sampling technique was utilized to select the participants in the study.

Data collection tool:

Self-administered questionnaire was used for data collection, validated from the previous study's published , after permission was taken through email from the researcher, with some modification and preamble letter was issued to explain the aim of the study, request to participate, and appreciation for a response. Then, the questionnaire was validated by three

consultants. After that, it was translated to Arabic language and validated again by three consultants. The questionnaire consists of three sections:
Section A: Socio-demographics.
Section B: Attitude towards seasonal flu and influenza vaccine.
Section C: Reasons for accepting or reasons for refusing flu vaccine .

Responses to attitude questions were scored in the way that, the highest the score, the more positive the attitude towards seasonal influenza vaccination and vice versa. Then, the total score for each participant was computed and its median vale was identified (it was 8). Patients scored at median or above were regarded as having "positive attitude" whereas those scored below the median were regard as having "negative attitude".

Data collection technique:
After the arrival of the patient to the PHCC, they should go to the reception first to register and ensure the presence of the center's card. Then, the receptionist gives a number to every patient who waits until called by the nurse to detect the vital signs. During that period of waiting the researcher will select patient conveniently until the target number achieves and gives the questionnaire for answering after taking the consent.

Data entry and analysis:
The Statistical Package for Social Sciences (SPSS) software version 22.0 was used for data entry and analysis. Descriptive statistics (e.g., number, percentage) and analytic statistics using Chi-Square tests (χ^2) to test for the association and the difference between two categorical variables were applied. A p-value ≤ 0.05 was considered statistically significant.

Pilot study:
A pilot study was conducted in one PHCC in the same sector due to the similarity to the target group using the same questionnaire to test the methodology of the study. As a feedback, the questionnaire was clear and no defect was detected in the methodology.

Ethical considerations:
- Permission from the Makah joint program of family medicine was obtained.
- Permission from the Directorate of Health Affairs of the Holy Capital Primary Health Care was obtained.
- Verbal consents from all participants in the questionnaire were obtained.
- All information was kept confidential, and results will be submitted to the department as feedback.

Relevance:
- This study was carried out to assess the prevalence of influenza immunization among DM patients in "Al-Zahir PHCC".
- At the end of this study we are able to identify some factors associated with the success rate of influenza vaccination among DM patients in "Al-Zahir PHCC".

Budget: Self-funded

Result

Table 1: Distribution of socio-demographic characteristics of diabetic patients in primary health care center, Makah (n-200)

	N	**%**
Age		
<60	58	29

>60	142	71
Range	53-81	
Mean±SD	68.45±11.18	
Gender		
Male	130	65
Female	70	35
Marital status		
Single	16	8
Married	140	70
Divorced	24	12
Widow	20	10
Level of education		
Less than secondary	84	42
Secondary	70	35
University	26	13
Postgraduate	20	10
Home/living		
Alone	60	30
With spouse and children	110	55
With parents	30	15
Occupation		
Working	60	30
Not working	140	70
Duration of diabetes mellitus (years)		
<5	44	22
5-10.	76	38
>10	80	40
Range	4-40.	
Mean±SD	39.58±20.540	

The study included 200 patients, table 1 show the remaining socio-demographic characteristics of the patients. Their age ranged between <25 and >45 years most of participants between(25-45) were (44.0%) with Mean±SD (42.871±7.183) and Range (21-62)years, majority of participants were(52.0%) were females. About (55.0%)were married. More than one-third of the participants were either less than secondary (34.0%) or university educated (27.0%). Approximately half of them (66.0%) were working, while(64.0%) influenza vaccination

Table 2: Distribution of reasons for accepting flu vaccination among adult diabetic patients

	N	**%**
Receiving flu vaccination		
No	90	45.00
Yes	110	55.00
Reasons for accepting flu vaccination (n=110)		

Doctor told me it's important	73	66.36
It was free of charge	55	50.00
Patient/friend told me it's effective	49	44.55
Information from mass media	43	39.09
Health awareness within the health center	60	54.55
Reasons for refusing flu vaccination (n=90)		
It is not necessary because flu is just a minor illness	34	37.78
Concern about vaccine's side effects	40	44.44
Belief that the vaccine was not effective	26	28.89
Fear of needles and injection	18	20.00
Forgetting	26	28.89

Regarding the receiving flu vaccination the majority of participant . Not received were(55.0%) among patients accepting flu vaccination(n=110) , the main reasons were doctor told me it's important (66.36%) and health awareness within the health center (54.55%). While reasons for refusing flu vaccination (n=90) the majority of participant Concern about vaccine's side effects were(44.44%) followed by It is not necessary because flu is just a minor illness were(37.78%).

Figure (1): Distribution of reasons for accepting flu vaccination among adult diabetic patients.

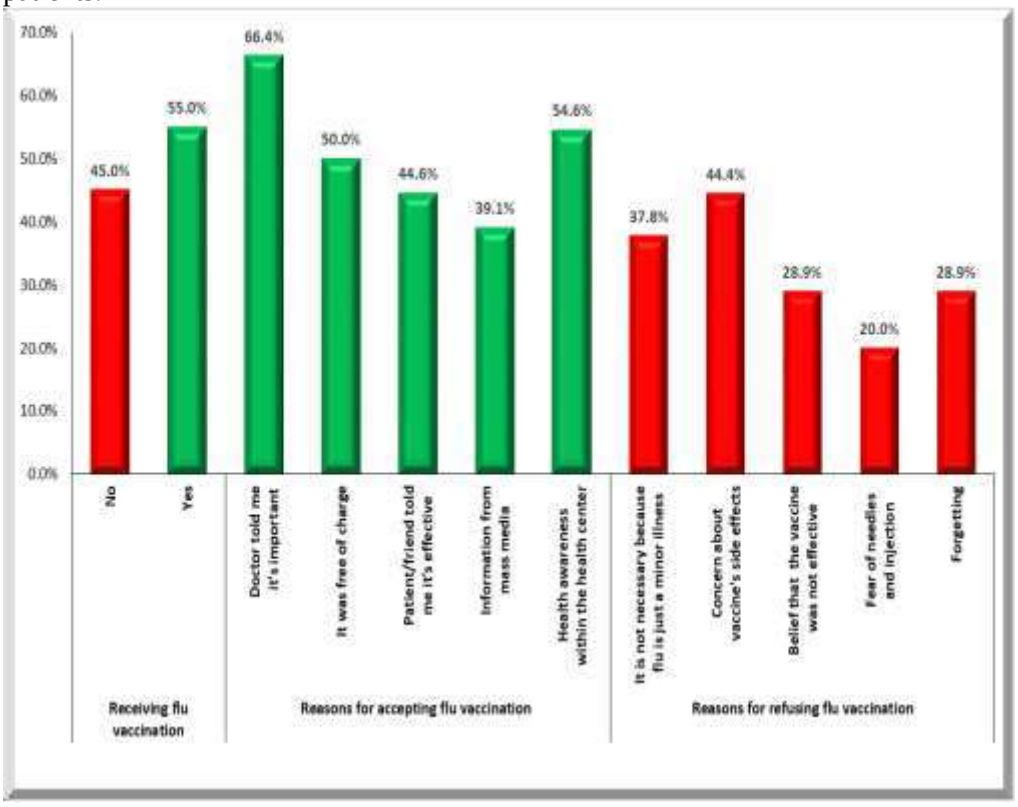


Table 3: description of attitude of diabetic patients towards influenza vaccination

Items		**towards flu vaccination**			**% of agreement**	**Chi-square**	
		Agree	**Don't know**	**Disagree**		**X^2**	**P-value**
Influenza vaccination is	N	130	30	40	81.67	91.000	<0.001*
	%	65.0	15.0	20.0			

important among diabetics and should be taken yearly							
Influenza vaccine prevent serious complication among diabetics	N	110	28	62	74.67	50.920	<0.001*
	%	55.0	14.0	31.0			
Influenza vaccine has serious side effect and therefore should not be taken	N	60	42	98	60.33	24.520	<0.001*
	%	30.0	21.0	49.0			
All diabetics should receive influenza vaccine	N	90	40	70	70.00	19.000	<0.001*
	%	45.0	20.0	35.0			
Flu is a mild illness and therefore vaccination is not necessary	N	90	26	84	67.67	37.480	<0.001*
	%	45.0	13.0	42.0			
I don't need the flu vaccine because I have life immunity against flu	N	70	42	88	63.67	16.120	<0.001*
	%	35.0	21.0	44.0			
If there is an effective vaccine to prevent flu, l will take it	N	100	60	40	76.67	28.000	<0.001*
	%	50.0	30.0	20.0			

Table 2 shows all the items is had attitude a statistical significant relation towards flu vaccination while P=value 0.001, that more than half of the diabetic patients (65.0%) agreed that Influenza vaccination is important among diabetics while Chi-square X^2 (91.000), the majority of the participants (55.0%) agreed that all that Influenza vaccine prevent serious complication among diabetics while Chi-square X^2 (50.920) On the other hand, 98 patients (49.0%) disagreed that Influenza vaccine has serious side effect and therefore should not be taken while X^2 (24.520), 90 patients (45.0%) agree that All diabetics should receive influenza vaccine while X^2 (19.000), 90 patients (45.0%) agree that Flu is a mild illness and therefore vaccination is not necessary while X^2 (37.480), 88 patients (44.0%) disagreed that they don't need the flu vaccine because they have life immunity against flu while X^2 (16.120) and 100 patients (50.0%) there is an effective vaccine to prevent flu, l will take it while X^2(28.000)

Table 4: Distribution of the total attitude of diabetic patients towards seasonal influenza vaccination

Total Attitude		
	N	**%**
Weak	59	29.5
Average	79	39.5
High	52	26
Total	200	100

Score	**Range**	7-19.
	Mean+SD	13.065±3.822
Chi-square	**X^2**	11.59
	P-value	0.003

This table shows the majority of participant (39.5%) have average level of total attitude of diabetic patients towards seasonal influenza vaccination followed by (29.5%) of participant weak while Range(7-19) and Mean ±SD(13.065±3.822), **X^2**11.59 P=0.003

Figure (2): Distribution of the total attitude of diabetic patients towards seasonal influenza vaccination

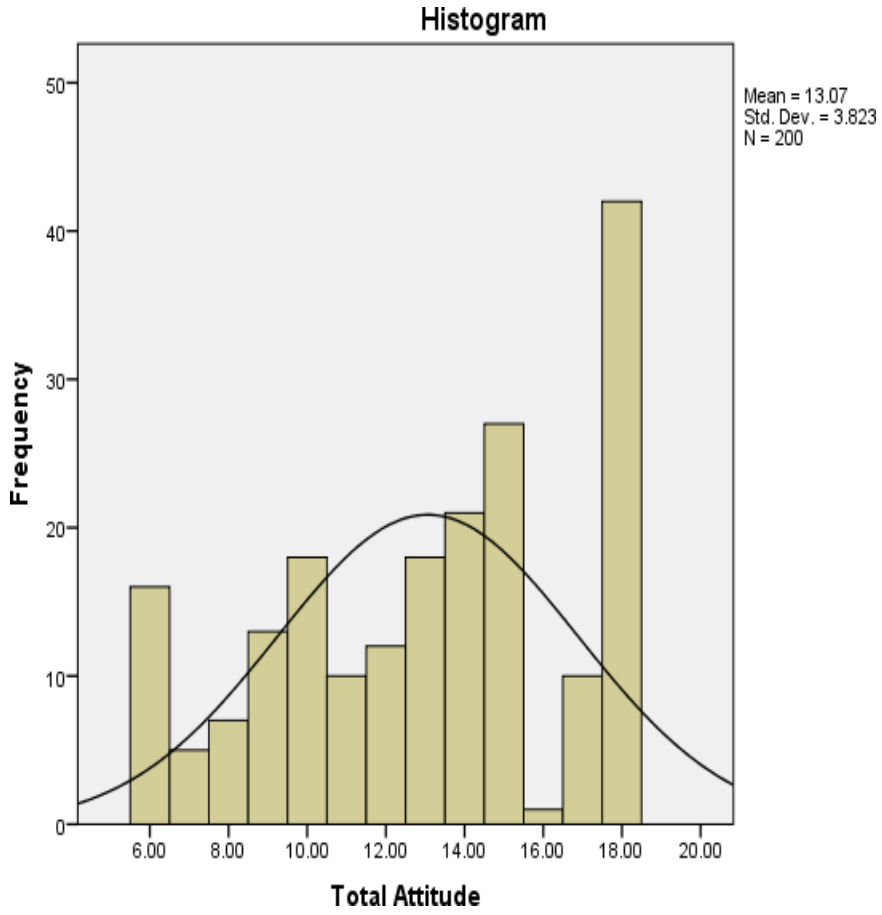


Table 5: Distribution of the associated of the total attitude of diabetic patients towards seasonal influenza with socio-demographic factors with vaccination .

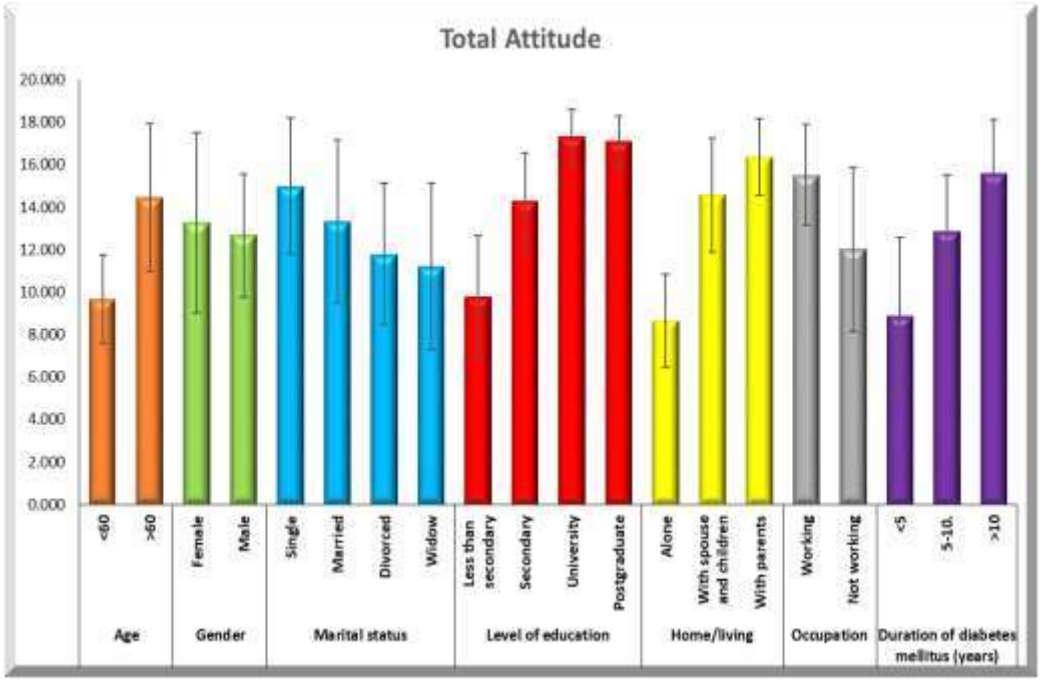
		N	Total Attitude			F or T	ANOVA or T-test	
			Mean	±	SD		test value	P-value
Age	**<60**	58	9.672	±	2.089	T	-11.904	0.000
	>60	142	14.451	±	3.492			
Gender	**Female**	130	13.277	±	4.235	T	1.193	0.234
	Male	70	12.671	±	2.893			
Marital status	**Single**	16	15.000	±	3.225	F	4.262	0.006
	Married	140	13.329	±	3.817			
	Divorced	24	11.792	±	3.349			
	Widow	20	11.200	±	3.915			
Level of education	**Less than secondary**	84	9.786	±	2.858	F	105.942	0.000
	Secondary	70	14.271	±	2.290			
	University	26	17.308	±	1.289			
	Postgraduate	20	17.100	±	1.210			
Home/living	**Alone**	60	8.650	±	2.185	F	148.116	0.000
	With spouse and children	110	14.573	±	2.683			
	With parents	30	16.367	±	1.810			
Occupation	**Working**	60	15.517	±	2.369	T	7.842	0.000
	Not working	140	12.014	±	3.852			
Duration of diabetes mellitus (years)	**<5**	44	8.886	±	3.706	T	77.013	0.000
	5-10.	76	12.842	±	2.674			
	>10	80	15.575	±	2.530			

Table5 shows regarding The age, gender, marital status, level of education, Influenza vaccination about the influenza vaccination adult patients who had a significantly were P-value= 0.000,in knowledge and attitude

increase in age <25 were Mean± SD(7.000±1.619) in
also regarding marital status and total attitude towards influenza vaccination who had a significantly while F=4.262 and P=value 0.006 increase in married were Mean± SD(13.329±3.817), regarding level of education and total attitude towards influenza vaccination who had a significantly while F=105.942 and P=value 0.000 increase in university were Mean± SD(17.308±1.289), regarding Home/living and total attitude towards influenza vaccination who had a significantly while F=148.116 and P=value 0.000 increase in parents were Mean± SD(16.367±1.810), while occupation and total attitude towards influenza vaccination who had a significantly while T=7.842 and P=value 0.000 increase in working were Mean± SD(15.517±2.369) and duration of diabetes mellitus (years) and total attitude towards influenza vaccination who had a significantly while T=77.013 and P=value 0.000 increase in <10 years were Mean± SD(15.575±2.530)

Other factors gender and total attitude towards influenza vaccination who had not significantly while T=1.193 and P=value 0.234 increase in female were Mean± SD(13.277±4.235)

Figure (3): associated of the total attitude of diabetic patients towards seasonal influenza with socio-demographic factors with vaccination



DISCUSSION

The present study aimed to assessment Prevalence of Influenza Immunization during Hajj among Diabetic Patients attending Primary Health Care Center in Makah Al-Mokarramah at Saudi Arabia 2022. The outcome of this research showed that a high majority of the participating diabetic patients were not aware of the details about this infection as the majority of them reported that it is a viral infection, which could be transmitted from one person to another and could be prevented. In addition, a great majority of the participating diabetic patients showed average knowledge regarding the difference in severity of seasonal flu between diabetic and diabetic individuals, which is evidenced by reporting that seasonal flu symptoms and complications might be more serious among diabetic patients.

It has been reported that diabetic patients, even well controlled are 3 to 6 times more likely to be hospitalized as a result of influenza complications, particularly pneumonia than others and death rates among them increase between 5 and 15% during epidemics of influenza [19, 20]

In a retrospective cohort study carried out in Taiwan (2013), the vaccinated elderly diabetic patients had lower incidences of pneumonia and respiratory failure compared with the non-vaccinated patients. Additionally, they had an 11% lower hospitalization rate than the non-vaccinated patients. Moreover, they were less likely to be admitted to the intensive care unit (ICU) [21]

More than half of diabetic patients in the present study perceived Influenza vaccination as an important tool for diabetics and should be taken yearly. This positive attitude was associated with higher uptake of the vaccine. Similarly, in South Africa [17], uptake of influenza vaccine was higher among diabetic patients who had better perception that influenza can be prevented and believe that it is an effective vaccine. Therefore, it is recommended to improve awareness of diabetics regarding the importance of influenza vaccination to reduce morbidity and mortality in this vulnerable group[21]. The effectiveness of the seasonal influenza vaccine depends mostly on characteristics of patients, whether there is matching between the circulating viruses and the viruses contained in the vaccine, and finally on the types and subtypes of influenza virus.[22, 23] In a systematic review carried out in 2015, influenza vaccination prevented all-cause hospitalization with vaccine effectiveness of 58% and hospitalization admission due to influenza with vaccine effectiveness of 43% [18]

It is recommended to have seasonal influenza vaccine before winter season as antibody response generally needs about two weeks to be developed. [22, 23]

In this study, more than half of diabetic patients (50.0%) reported that if there is an effective vaccine to prevent flu, they will take it and 55.0% believe in effectiveness of influenza vaccine in preventing serious influenza complications, however, 30.0% of them fear from serious side effects of the vaccine. In a study carried out in Spain, 24% of diabetic patients did not believe in the effectiveness of the vaccination or feared side effects. However, only 4 (1%) of patients experienced mild adverse reactions to influenza vaccination.[24] In South Africa, only 29.5% of diabetic patients considered vaccination as an effective means of preventing severe influenza-related complication [17]

In the present study, the main reasons for accepting seasonal influenza vaccine among diabetics were being the vaccine free of charge and patients being informed by doctor that the vaccine is important. Therefore, physicians` recommendation is very important in educating patients regarding the benefits of influenza vaccination utilizing accurate information and encourage them to uptake it to prevent adverse outcomes of influenza [25, 26]. In a similar study conducted in South Africa [17], better knowledge of vaccine and influenza, positive attitude towards vaccination, being informed by doctors and fellow patients who have been previously vaccinated and availability of the vaccine free of charge were the main contributors for having the vaccine. Other studies reported that awareness of seasonal influenza vaccination recommendations, previous history of influenza vaccination, perception of the harmful effects of influenza infection, particularly for diabetics, and perceived advantages of being vaccinated against influenza were predictors for up taking the vaccine [27, 28]

In the current study, the main reasons to refuse seasonal influenza vaccine by diabetic patients were being not necessary because flu is just a minor illness (37.78%), forgetting (28.89%) and belief that the vaccine was not effective (28.89%). In a similar study carried out in South Africa, the main reason was use of other different protection (51.4%) [17,29].

also the associated of the total attitude of diabetic patients towards seasonal influenza with socio-demographic factors with vaccination regarding the age, marital status, level of education, home/living, occupation were a significantly while P=value 0.000 , also factors gender and total attitude towards influenza vaccination who not significantly while P=value 0.234.(See table5)

CONCLUSION

The main reasons for up taking seasonal influenza vaccine were being free of charge and doctor informed the patients that it is important. The main reasons for refusal of seasonal influenza vaccine were being not necessary because flu is just a minor illness, forgetting and belief that the vaccine was not effective .

Almost half of diabetic patients in Makah had positive attitude towards seasonal influenza vaccine and have been vaccinated. Positive attitude was associated with higher uptake of the vaccine. Additionally, higher uptake of the seasonal influenza vaccine was associated with younger diabetic patients and those with less than 5 years or more than 15 years of diabetes.

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