

Vaccine hesitancy and COVID-19 vaccine acceptance in Makkah Al-Mukarramah, Saudi Arabia

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Abstract

Background: Lack of knowledge, resources and community feedback could play a great role in developing vaccine hesitancy among populations. This study aimed to determine the prevalence of vaccine hesitancy and to assess the acceptance of COVID-19 vaccine during the ongoing MERS-CoV-2 pandemic in Makkah, Saudi Arabia.

Methods: A cross-sectional study was conducted during March 2020 on the local population (n=262) of Makkah Al-Mukarramah. A pre-tested electronic questionnaire was used to obtain participants' demographic data, knowledge base and attitudes.

Results: Of 262 participants, 76% were adults (18 to 60-years-old), and 24% were parents. Around 62% of participants were keen to take the flu vaccine. Regarding vaccine knowledge and the source of the knowledge, 92% had heard of the influenza vaccine from their health care provider, health awareness campaign, social media, relatives or friends, at 45%, 29%, 16%, and 11%, respectively. A significant interaction was found between participant's age group and willingness to accept the introduction of a new vaccine against novel corona virus (P = 0.00).

Conclusion: Currently, vaccine hesitancy in Makkah is high (38%) compared to previous findings. It is recommended that improved measures should be taken to create more awareness through increased communal educational campaigns. Moreover, continuing education about the importance of vaccinations should be conducted by health care providers. Additional studies are needed in Makkah to assess the vaccine hesitancy movement.

Keywords: Vaccine hesitancy, Influenza, prevalence, Saudi Arabia, MERS-CoV2, COVID-19

Introduction

Up to the middle of the last century, people of all ages died from diseases that could be prevented by vaccines, hence they are called vaccine-preventable diseases (1). Infants, in particular, were contributing to the high mortality rates due to their weak developing immune systems. For instance, deaths from polio infection reached 1904 cases in 1950 in the United States (1). Other diseases such as measles, diphtheria, smallpox, and pertussis secured top positions on the list of childhood killers.

Nevertheless, most of these diseases were contained with the discovery of vaccinations. Smallpox infection, for example, has been eradicated (1). Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine (2). Immunity to a disease is achieved when the body synthesizes specific proteins, called antibodies, which act against a particular disease; antibodies are thus disease specific.

Immunity is of two types, active immunity, and passive immunity. With passive immunization, the body is exposed to less virulent particles of the target pathogen, creating an infection alert; the vaccine tricks the immune system and urges it to synthesize the antibodies. With active immunization, antibodies are generated readily from pathogens of the outer environment. Active immunity has more benefits than passive immunity as it lasts longer, in some cases for a lifetime (2,3).

Vaccine hesitancy is defined as the refusal of people to take vaccines or a delay in vaccine acceptance despite vaccination offers from health authorities (3). Hesitancy is widely prevalent and includes people who have not yet rejected vaccination (4). Several factors contribute to vaccine hesitancy, mainly, complacency, convenience, confidence, belief related, and low socioeconomic status. This could lead to parental doubts about vaccine safety, side effects, effectiveness, and its components. Some parents believe that pediatric illnesses are part of the child's development (5).

In Saudi Arabia, the Saudi immunization coverage showed that basic vaccines coverage ranged between 96-98% (6). However, it is noticeable that vaccine hesitancy is a growing trend, which has contributed to the re-emergence of vaccine-preventable diseases. Considering such a trend, it is rational to suspect a possible hesitancy toward future vaccines against the novel corona virus (SARS-CoV2). This virus emerged near the end of 2019 after its initial identification from Wuhan, China (7). Within a few months, it spread across the globe and became one of the major health concerns worldwide and was labeled a pandemic by the World Health Organization (7).

Only a few studies have been conducted to address the concern about vaccine hesitancy in Saudi Arabia. One of these studies is a study at King Abdul-Aziz Medical City, Riyadh, Saudi Arabia, to determine the prevalence of influenza vaccine hesitancy and the effect of vaccine

awareness campaigns on vaccine acceptance. It revealed low influenza vaccination hesitancy (17%). However, common reasons for hesitancy included that the vaccine has no effect and is considered unnecessary. The sources of information about influenza vaccination were awareness campaigns and health education provided by medical staff (8).

Another study among medical students in central Saudi Arabia showed knowledge and uptake of influenza vaccination were inadequate. The main reasons given were lack of risk of influenza infection (37.90%), worry about side effects (28.90%), doubt of vaccine effectiveness (14.50%), and difficulties in scheduling the time for getting the vaccine (11.03%) (4). Worldwide, influenza results in significant morbidity and represents a public health problem with considerable socioeconomic implications (9).

Many studies have been performed previously to assess vaccine hesitancy in different populations, yet none of these took place in Makkah. This study aimed to determine the prevalence of vaccine hesitancy and to assess the acceptance of COVID-19 vaccine during the ongoing MERS-CoV-2 pandemic in Makkah, Saudi Arabia.

Subjects and Methods

A cross-sectional study was conducted in Makkah city, Saudi Arabia in partnership with Umm Al-Qura University (UQU) during March 2020 among adult residents found on the most-popular social media applications (WhatsApp, Twitter and Snapchat).

The sample size was collected based on a population of 1,000,000 in Makkah with 262 participants recruited at a 95% confidence interval (CI) and a 5% margin of error. Adults 18 to 60-year-old living in Makkah city with online access were included in the study. Whereas, residents who were <18 or >60-year-old, living outside Makkah and who did not have online access were excluded.

Data were recorded by a Google form questionnaire via the social media applications. The participants were subjected to a well-structured, Arabic-based, validated questionnaire (8). The questionnaire was an internet-based tool that consisted of five sections. The first section had demographic information (age, sex, educational level, economic status, chronic illnesses, and nationality). Section two was concerned with the knowledge of the participant's perceptions regarding vaccinations and their source of knowledge. In the third section, participants were asked to state their attitudes towards vaccination. Section four focused on compliance with vaccinations. The last section concentrated on reasons for hesitancy, if present.

Statistical Package for the Social Sciences (SPSS), version 21.0 was used to analyze the questionnaire. Section one of the questionnaire was analyzed using the descriptive statistics to assess frequency distribution of the data. The last four sections were analyzed using the cross tabulations and ANOVA test to assess the interactions between the participant's perception regarding vaccinations and their hesitancy if present.

Results

Of the 262 participants, 76% were adults (18 to 60-year-old), and 24% were parents with 51 male and 211 female participants (Table 1).

Table 1: Characteristics of study participants (n=262)

Characteristics	Frequency	Percentage (%)
Participants:		
Adult	199	76.0
Parent	63	24.0
Gender:		
Male	51	19.5
Female	211	80.5
Nationality:		
Saudi	253	96.6
Non-Saudi	9	3.4
Educational Level:		
Secondary	49	18.7
Intermediate	3	1.1
Bachelor	198	75.6
Higher education studies	12	4.6
Marital Status:		
Single	162	61.8
Married	100	38.2

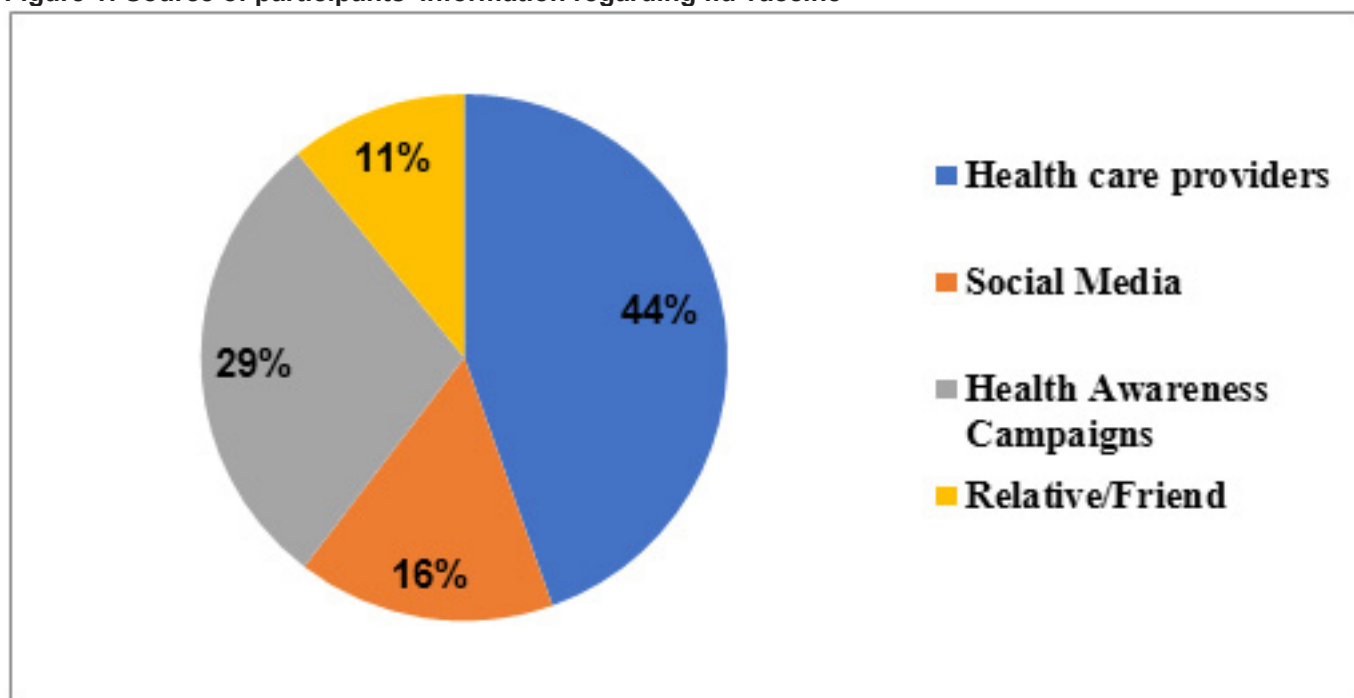
Knowledge, attitude, practice, and the future hesitancy after the outbreak of COVID-19 was also measured and it was found that 96.95% participants agreed on vaccination safety and 87.40% support seasonal flu vaccination (Table 2).

Table 2: Knowledge, attitude and practice of participants regarding non-obligatory vaccines

S/N	Variables	Yes N (%)	No N (%)
1	Do you think Vaccination is safe?	254 (96.95)	8 (3.05)
2	Have you ever heard of seasonal influenza vaccine?	241 (91.98)	21 (8.02)
3	Do you support vaccination against seasonal flu?	229 (87.40)	33 (12.60)
4	Is there a possibility that you will take the seasonal flu vaccination after outbreak of Corona Virus (COVID 19)	175 (66.79)	87 (33.21)
5	If there is a new vaccine against the new Corona virus (COVID 19), will you take it?	227 (86.64)	35 (13.36)

The participants' information about flu vaccine was found to be versatile, where, 45% reported that they had heard information from their health care providers and 29% from health awareness campaigns (Figure 1).

Figure 1: Source of participants' information regarding flu vaccine



Around 2.67% participants believed that there is no need to be vaccinated at almost any age (Table 3).

Table 3: Participants beliefs regarding age groups who needed to take vaccines

	Frequency	Percentage (%)
Children till 18 years	26	9.92
Adult till 65 years	13	4.96
Elderly > 65 years	3	1.15
All age groups	213	81.30
Nobody	7	2.67
Total	262	100.0

Moreover, it was demonstrated that 7.36% participants believed that no one is in need of vaccination regardless of their health situation (e.g. chronic disease, or pregnancy) and only 62% participants were keen to take the vaccine (Table 4).

Table 4: Participants belief regarding people most in need of vaccination for Seasonal Flu

	Frequency	Percentage (%)
Everyone	167	64.73
Everyone with chronic diseases	63	24.42
Pregnant ladies	6	2.33
I think no one really needs them	19	7.36
Others	3	1.16
Total	262	100.0

Around 25.19% participants would never adhere to taking the flu vaccine regardless of the time of the year and despite if they were asked by a health care provider or not (Table 5).

Table 5: Practice of participants regarding flu vaccination

	Frequency	Percentage (%)
Annually	55	28.63
Sometimes	75	20.99
When I am Asked by Healthcare provider	66	25.19
I do not take the vaccine	66	25.19
Total	262	100.0

The first most common reason was the lack of perception of need (n=16, 32.7%), whereas the second most common reason was the perception of ineffectiveness (n=8, 16.4 %) (Table 6).

Table 6: Cross tabulation: Frequency of reasons that lead to flu vaccination hesitancy

The reasons for vaccine hesitancy	Frequency	Percentage
I do not need it	16	32.7
I don't think it is useful or effective	8	16.4
it hurts	4	8.2
A friend or relative advised me not to take it	4	8.2
It causes side effects	3	6.1
It causes diseases like autism	2	4
I don't care	2	4
I am allergic to seasonal flu vaccine	1	2
Better for immunity not to take it	1	2
Others	8	16.4
Total	49	100

Approximately, 18.7% out of 33.2% parents do not give their children the flu vaccine. Furthermore, 13.36% participants are not willing to take COVID-19 vaccine if it would exist in the future (Table 7).

Table 7: Do you give your child the seasonal flu vaccine?

	Frequency	Percentage
Yes	38	14.50
No	49	18.70
I don't have children	175	66.80
Total	262	100

Discussion

Vaccinations are among the most effective public health interventions against infectious diseases. Vaccine hesitancy is a continuum of behaviors ranging from delay in receipt to vaccination refusal. The World Health Organization (WHO) identified vaccine hesitancy as one of the top ten global health threats in 2019 (10).

Vaccine hesitancy is one of the reasons identified for the Global Vaccine Action Plan to miss its goals by 2020 (11). This study was conducted to determine the prevalence of vaccine hesitancy in Makkah Al- Mukarramah, Saudi Arabia. The study included 262 individuals and it was found that the overall vaccine hesitancy was high in Makkah population (38%). The most common reasons for refusal were lack of perception of need (32.7%), and perception of ineffectiveness (16.4 %).

The current study hypothesis stated that vaccine hesitancy is more prevalent than the previous literature conducted outside Makkah, which was supported by the results found. Since this study took a different approach to measure vaccine hesitancy from the previous literature, the comparison of results between this study and the results of the literature would be based on the closest and the most similar measures, which is in this case was the willingness to take the flu vaccine.

In the current study, 38% ultimately refused to take the influenza vaccine. This result is higher than the reported flu vaccine hesitancy rate in Alabbad et al., in Riyadh, Saudi Arabia 2017 (8). A common selected reason for this hesitancy was, "I don't think it is useful or effective". In Alabbad et al, 21.5% of the 17% who were hesitant responded this way, while in this study, it was 4.58% of the 38% who gave the same response (8).

The response choice "I don't need it because I am healthy" was selected by 17.6% of the 17% who were hesitant in Alabbad et al, while in this study it forms 10.69% of the 38% who were hesitant. The response choice "it causes side effects" was selected by 13.7% of the 17% in Alabbad et al., [8] while in this study, it was chosen only by 2.67%.

Regarding vaccine knowledge and the source of the knowledge, in Alabbad et al., 89% of the participants knew about the influenza vaccine, with the knowledge source being medical staff, health awareness campaign, and social media, at 25%, 24%, and 20%, respectively (8). In this study, 91.98% were aware of the influenza vaccine, with their source of knowledge being the medical staff, health awareness campaign, social media, relatives or friends, at 45%, 29%, 16%, and 11%, respectively.

The current study had some limitations. First, assessing the knowledge, attitude, and practices toward vaccines was from a self-reported questionnaire. Second, convenience sampling was adopted that was restricted to one city; therefore, this study has limited generalizability. On the other hand, there were many studies performed to assess vaccine hesitancy in different populations of Saudi Arabia and the Middle East North Africa region, yet none of these took place in Makkah; additionally, local attitudes toward COVID-19 were assessed right at the beginning of the outbreak to measure the possible future hesitancy against any expected COVID19 vaccine.

Conclssion

Currently, vaccine hesitancy in Makkah is high (38%) compared to previous findings. It was recommended that improved measures should be taken to create more awareness through increased communal educational campaigns. Moreover, continuing education about the importance of vaccinations should be conducted by health care providers. Additional studies are needed in Makkah to assess the vaccine hesitancy movement.

Authors' contributions

All author contributed equally to literature search, figures, study design, data collection, data analysis, data interpretation, writing.

List of abbreviations:

Confidence Interval (CI)
Statistical Package for the Social Sciences (SPSS)
Umm Al-Qura University (UQU)
World Health Organization (WHO)

Conflict of Interest:

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

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