

RESEARCH ARTICLE

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# The Attitude Regarding the Uptake of Influenza Vaccine in the COVID-19 Era in Jeddah City, Saudi Arabia

Mujallad Alaa<sup>1\*</sup> , Hala Mohammed Yasin<sup>2</sup> , Hotaf Abdullah Alharbi<sup>3</sup> ,  
Mazin Barry<sup>4,5</sup>  and Mohammed Qashqary<sup>6</sup> 

<sup>1</sup>Nursing Department, College of Applied Medical Sciences, College of Applied Medical Sciences University of Jeddah, Jeddah, Saudi Arabia.

<sup>2</sup>College of Applied Medical Sciences University of Jeddah, Jeddah, Saudi Arabia.

<sup>3</sup>Nursing Department, College of Applied Medical Sciences, University of Jeddah, Saudi Arabia.

<sup>4</sup>College of Medicine, King Saud University, Riyadh, Saudi Arabia.

<sup>5</sup>Division of Infectious Diseases, Faculty of Medicine, University of Ottawa, Ontario, Canada.

<sup>6</sup>Family and Community Medicine Department, University of Jeddah, Jeddah, Saudi Arabia.

## Abstract

The onset of COVID-19 has had a profound impact on the world, leading to significant adjustments in human behavior. A plethora of behavioral modifications have been embraced by individuals. As COVID-19 symptoms are similar to influenza symptoms, this study aimed to measure attitudes regarding the uptake of influenza vaccination in the COVID-19 era. This cross-sectional study used a self-administered questionnaire. A total of 311 participants were conveniently selected from two of the most popular shopping malls in Jeddah City, Saudi Arabia, during a three-day influenza awareness campaign conducted between 11 November 2020 to 14 November 2020. Demographic items and all scales (summed and examined for internal reliability using Cronbach's alpha) were analyzed using univariate analysis, including measures of central tendencies and frequencies. This study indicates that the COVID-19 pandemic has not significantly affected vaccination adoption rates. Only 9.3% of the individuals who received the vaccine expressed fear or a desire for protection against COVID-19.

**Keywords:** Influenza Vaccine, COVID-19, Saudi Arabia

\*Correspondence: afmojallad@uj.edu.sa

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## INTRODUCTION

The pandemic has had a profound impact on the global community, with many individuals modifying their habits and routines in response. Individual behavior has undergone significant transformations in response to the spread of COVID-19. In addition to precautionary measures like mask-wearing, social distancing, and handwashing,<sup>1</sup> there has also been a notable increase in health literacy awareness. The general public has become more informed about the factors that impact their well-being.<sup>2</sup> As COVID-19 symptoms are similar to influenza symptoms, this study aimed to measure the attitudes of the public regarding the acceptance of influenza vaccination during the COVID-19 era.<sup>3</sup>

Seasonal influenza is a respiratory disorder that occurs during winter and affects all age groups. Prior to the advent of the influenza vaccine, hospitals experienced high occupancy rates during the winter season, resulting in significant mortality. The demographic group most severely impacted comprised patients with comorbid conditions. Furthermore, individuals presenting at hospitals later in their illness trajectory necessitated admission to the Intensive Care Units for intensive monitoring. Patients not only suffer due to physical but also substantial financial burdens due to the associated hospitalization expenses.<sup>4</sup> Since the onset of the COVID-19 pandemic, individuals have exhibited heightened vigilance in safeguarding themselves against newly emerging viral threats. Awareness regarding the significance of vaccination and the concept of herd immunity has concurrently surged.<sup>5</sup>

This study was conducted in Jeddah City, Saudi Arabia, a globally significant urban center, both culturally and economically. Situated along the Red Sea, it boasts one of the busiest ports globally, owing to Saudi Arabia's status as one of the world's leading oil producers<sup>6</sup> Jeddah is also the primary entry point for Hajj pilgrims, making it a pivotal location for Muslims. The Hajj is the world's largest annual gathering and holds profound importance as one of the "five fundamental pillars of Islam".<sup>7</sup> The Hajj season affects the growing population of diverse nationalities<sup>8</sup>

Patients may occasionally hold divergent perspectives concerning the Muslim cultural approach to vaccine or medication utilization. Within Muslim communities, the perception of illness causality assumes a pivotal role in dealing with illnesses. They are aware of the biological factors and modern medical practices; concurrently, they maintain a belief in a metaphysical force as the ultimate determinant of all biological symptoms.<sup>9</sup> The root of this belief stems from the Islamic belief of Qadar, which is that everything that happens to people is the result of God's will. Muslims believe that one should accept what God chooses for us, including illness; however, they also believe that they can seek treatment for the cure.<sup>10</sup>

Healthcare providers are on the frontline of pandemics, so their opinions and safety are essential. A previous study examined nurses' intentions to receive the influenza vaccine during the COVID-19 pandemic, as vaccinating everyone remains crucial, especially healthcare providers.<sup>11</sup> Another study reported a high demand for vaccines due to an insufficient supply of personal protective equipment, availability of isolated rooms, and unfavorable attitudes toward workplace infection control policies among nurses in the early phase of the epidemic in Hong Kong.<sup>12</sup> Another study conducted in Italy during the COVID-19 pandemic found that the willingness of healthcare providers to receive the influenza vaccine had increased.<sup>13</sup>

In contrast, a study conducted in Saudi Arabia focusing on healthcare providers' views regarding their intention to receive the influenza vaccine amidst the COVID-19 pandemic revealed no correlation between the aforementioned factors. Statistical analyses have demonstrated a high acceptance of the influenza vaccine among healthcare workers in Saudi Arabia, and no discernible variation was observed during the pandemic.<sup>14</sup>

Another study conducted in Riyadh, Saudi Arabia, investigated the population's perception of the influenza vaccine amid the backdrop of the COVID-19 pandemic. The population exhibited a higher rate of COVID-19 vaccine acceptance compared to other nations. Furthermore, the adoption of the influenza vaccine experienced an upsurge within the Saudi population residing in Riyadh during the pandemic.<sup>15</sup>

The discovery of seasonal influenza vaccines has resulted in positive outcomes in saving lives, improving quality of care, and cost-effectiveness. The mortality and morbidity rates have also decreased significantly.<sup>16</sup> The World Health Organization (WHO) has reported that Saudi Arabia is among the nations whose healthcare systems have made significant strides in recent years.<sup>17</sup> Healthcare is free for everyone, and many hospitals have been built using the latest technology to serve everyone in need.<sup>18</sup> Moreover, the Ministry of Health in Saudi Arabia invests significantly in health education with the aim of fostering educated and healthy communities.<sup>19</sup> While the demand for the influenza vaccine was lower than the target numbers,<sup>20</sup> we aimed to determine if the COVID-19 pandemic had increased public awareness of the importance of vaccination.

## METHODOLOGY

This cross-sectional study used a self-administered questionnaire. A total of 311 participants were conveniently selected from two of the most popular shopping malls in Jeddah City, Saudi Arabia, during a three-day influenza awareness campaign conducted from 11 November 2020 to 14 November 2020. The administered questionnaire consisted of demographic data and questions regarding knowledge, attitudes, and beliefs regarding influenza vaccination. The survey included questions pertaining to the influence of COVID-19 on other respiratory vaccinations, with certain questions offering multiple response options.

### Sample criteria

All individuals who were in the malls were invited to participate in the study (N=311). The study encompassed adults aged 18 years and older. Individuals aged <18 years were excluded from this study.

### Data collection tool

A previously used and published questionnaire in Arabic, designed by one of the researchers, was utilized.<sup>21</sup> The questionnaire comprised three main parts.

- Socio-demographic data.

- Questions regarding knowledge, attitudes, and beliefs regarding the influenza vaccine.
- Questions on the effect of COVID-19 on other respiratory vaccines.

### Data collection technique

The researcher interviewed the participants during campaign hours. Data were collected using Google Forms. When the authors collected data from a group of participants, the interviewing researcher remained unobtrusive on the sidelines, ready to address any inquiries, assist in survey completion, and distribute rewards and incentives, thereby reducing the number of duplications. Additionally, the researchers conducted a thorough review of all questions before participants departed to identify and rectify any duplicate entries or unanswered questions. To collect the sample size intended by the authors, campaign advertisements were circulated on all social media platforms. Each participant was provided an incentive to motivate them to participate.

### Ethical considerations

- Ethics approval was obtained from the local Ethics committee.
- Individual consent was a prerequisite for the data collection.
- The questionnaire was written at the beginning, indicating an agreement to participate in the study.
- All information was kept confidential and not accessed, except for the purpose of scientific research.

### Data analysis

Demographic items and all scales were summed and examined for internal reliability using Cronbach's alpha and were analyzed using univariate analysis, including measures of central tendency and frequencies. The knowledge and attitude variables were analyzed using a univariate analysis. Data were entered, cleaned, managed, and analyzed using IBM SPSS Statistics for Windows/Macintosh, version 22 (IBM Corp., Armonk, N.Y., USA).

### Data management

To input the quantitative data, a variable

**Table 1.** Descriptive Statistics- Participants' Sample Characteristics (311)

Variables	N	%
<b>Gender</b>		
F	192	61.5%
M	120	38.5%
<b>Age</b>		
18-25	77	24.7%
26-35	89	28.5%
36-49	103	33%
50-65	40	12.8%
<65	3	1%
<b>Nationality</b>		
Saudi	211	67.6%
Non-Saudi	101	32.4%
<b>Level of Education</b>		
High School	94	30.2%
Diploma	15	4.8%
BS	145	46.5%
Graduate	46	14.7%
<b>Knowledge about the campaign</b>		
Healthcare Providers	38	12.2%
Family and Friends	73	23.4%
Mall	102	32.7%
Social Media	92	29.5%
University of Jeddah	7	2.2%
<b>Occupation</b>		
Government	55	17.6%
Private	103	33%
Student	53	17%
Non- Working	101	32.40%
<b>Participants with chronic diseases</b>		
Asthma	15	4.70%
Diabetes Miletus	28	9%
Hypertension	11	3.50%
Other	18	5.60%
None	240	76.90%

was established for each item, and each response option necessitated a numerical code. Each response option was assigned a different numerical code as documented in the codebook. For example, the responses for Strongly agree were coded as 1, and Strongly disagree were coded as 5. The missing variables were coded as 999. Given the responses to certain items, it became necessary to perform data clustering. In some questions,

the response options for an item (i.e., variable) were clustered together to reduce the skewness of the variable when there were small numbers of responses (<10% of the sample), conceptual similarities, or reasons for clustering the response options.

### Cleaning

The second step before performing any statistical analysis was to clean the data to reduce bias that could affect the results. In SPSS, a frequency distribution was performed for each variable to check for errors or missing data.

### RESULTS

This study comprised a total of 311 participants. A power analysis was employed to assess the adequacy of the sample size. Specifically, the power analysis was conducted to ascertain whether a minimum of 300 participants was adequate for detecting a significant medium effect with 80% power. Table 1 provides data on sample demographics. The participants' ages ranged from 18 to 65 years old. The demographic data revealed that 33% of the participants in the study fell within the age range of 36 to 45 years old. Of the participants, 61.5% were female and 38.5% were male. Of these, 67.6% of the participants identified as Saudi nationals, while the remaining 32.4% were non-Saudi. While the educational degrees of the participants varied, the majority (46.5%) held bachelor's degrees. Most participants worked for private entities (approximately 32.8%), knew about the campaign while in the shopping mall, and were healthy without any disease (76.9%). Most participants worked in the private sector (33%). Moreover, 76.9% of the participants had no chronic diseases.

This study placed significant importance on asking participants questions that were highly relevant to the research and specifically addressed their comprehension of the influenza vaccine and its importance. The average percentage of correct responses for all participants was 78.75%, and the average percentage of incorrect responses was 21.25% (Table 2).

This quiz included six multiple-choice questions to assess the knowledge of the flu vaccine. To compute a score or percentage of items

answered correctly, the following steps were taken: the incorrect response options and the I do not know options were clustered together, as all were considered incorrect answers. This consolidation was performed using the transform variable option

in SPSS. Next, the number of correct responses for each respondent was summed up. This score was then divided by six (representing the total number of questions) to compute the respective percentages. The variable used for further analysis

**Table 2.** Percentage of the correct answers (N =311)

	Frequency of participants who answered item correctly	Percentage
Does the influenza virus attack the respiratory system?	231	74%
Is it infectious?	273	87.5%
Is the influenza vaccine fit for the whole population, especially the elderly and patients with chronic conditions?	154	49.4%
Do you think you are susceptible to catch the flu?	236	75.7%
Do you think it is beneficial to get the Flu vaccine?	298	95.5%
When should you take the Flu vaccine?	283	90.7%
How can you take the vaccine?	245	78.5%

**Table 3.** Knowledge of Flu Vaccine (N=311)

Survey item responses	Frequency	Percentage
<b>Influenza Virus attacks the respiratory system?</b>		
Yes*	231	74%
No	50	4.9%
Do not know	31	25.6%
<b>Is it infectious?</b>		
Yes*	273	87.5%
No	28	9%
Do not know	11	3.5%
<b>Influenza vaccines does not fit the whole population especially the elderly and patient with chronic conditions?</b>		
Yes	95	20.2%
No*	154	49.4%
Do not know	63	58.5%
<b>Do you think you are susceptible to catch a Flu?</b>		
Yes*	236	75.7%
No	76	24.3%
<b>Do you think it is beneficial to get the Flu vaccine?</b>		
Yes*	298	95.5%
No	14	4.5%
<b>When should you take the flu vaccine?</b>		
Yearly*	283	90.7%
Every 3 years	11	3.5%
Every 5 years	0	0%
I do not know	17	5.8%
<b>How can you take the vaccine?</b>		
IM*	245	78.5%
IV	38	12.2%
Oral	8	2.5%
Nose	1	0.3%
I do not know	20	6.4%

was the percentage for the total number of correct responses. The responses to the individual items are presented in Table 3.

To understand attitudes toward the uptake of the flu vaccine in the COVID-19 era, quantitative data were collected by assessing attitudes toward influenza vaccine uptake. The descriptive findings regarding the adoption and acceptance of the flu vaccine in the COVID-19 era are as follows: Two survey items provided quantitative information on attitudes toward flu vaccine uptake in this context. The two items measuring religiosity revealed that the nurses in this sample were religious, which strongly influenced their work (Table 4). These findings indicate that COVID-19 does not significantly affect the influenza vaccine uptake. Approximately 9.3% of participants received the flu vaccine due to COVID-19.

Attitudes toward the uptake of the Flu vaccine in the COVID-19 Era.

## DISCUSSION

This study determined that the acceptance of the influenza vaccine was prevalent among communities. The level of understanding and awareness of the influenza vaccine displayed in this study was noteworthy and corroborated by another recent study.<sup>21</sup> The percentage of participants who believed that the influenza vaccine was effective, safe, and aware of the need to be vaccinated was high, as seen in the results of other studies.<sup>22</sup>

Approximately 37% of the participants did not receive the vaccine because they believed that they would not catch the flu or were afraid of its side effects. In contrast, 58.5% of the participants had no evidence or agreed (20.2%) that the influenza vaccine did not fit the whole population, especially older adults and patients with chronic conditions. These results were also observed in a similar cross-sectional study in Riyadh<sup>23</sup>; these results emphasize the importance of continuing awareness campaigns.

Furthermore, this study revealed that COVID-19 had little impact on influenza vaccination. Only 9.3% of the population that received the vaccine was afraid of COVID-19 or wanted protection. This result addresses knowledge gaps

**Table 4.** Attitudes toward the Flu Vaccine in the COVID-19 Era (N= 311)

Survey item responses	Frequency	Percentage
<b>Have you ever had any side effects from any vaccine?</b>		
Yes	214	68.6%
No	56	17.9%
I have never taken it	42	25.6%
<b>Why did you take the Flu vaccine?</b>		
Effective	105	51.5%
Prevent spreading	30	14.7%
Following Ministry of Health	30	14.7%
Religious Purposes	20	9.8%
COVID-19	19	9.3%

regarding the relationship between influenza vaccine effectiveness and COVID-19 among communities. This barrier can be addressed with more campaigns and health education that delivers facts about the effectiveness of the influenza vaccine in facing COVID-19 to increase awareness during this pandemic period.

### Study strengths

One of the key features that makes this study particularly noteworthy is its thorough analysis of the perception of influenza vaccination among the Saudi population during the ongoing COVID-19 pandemic. These findings are noteworthy because Saudi Arabia used strict regulations to mandate the COVID-19 vaccine for the entire population, which also affected the population's decisions regarding the uptake of other vaccines. Although the percentage of individuals who mentioned that COVID-19 affected their perception was high, their knowledge regarding the importance of vaccines was also high.

The heightened awareness of the flu vaccine among the Saudi Arabian populace can be attributed to the comprehensive healthcare system provided by the Saudi government, which extends essential healthcare services to all residents. Furthermore, the dissemination of educational materials and the government's overarching vision for Saudi Arabia, emphasizing community engagement through volunteerism to enhance overall well-being, exert a substantial influence on the propagation of this awareness. The Saudi population has been active since the

emergence of a new vision for Saudi Arabia to promote volunteer work. Public and private sectors collaborate for the common good of Saudi citizens. The Vision of Saudi Arabia was established in 2017 and was fully dependent on the economy of its e-petrol. Recently, the government put in its plan and named it the Saudi Arabian 2030 Vision. Vision 2030 aims to make the Kingdom of Saudi Arabia a strong, prosperous, and stable country. This vision has attracted all segments of society, especially the Saudi youth.<sup>24</sup> The vision addresses various areas concerned with reducing pollution, improving education, developing tourism, encouraging responsible citizenship, and improving the healthcare sector. The message of this vision is clear: it is about building a better tomorrow for future generations.<sup>25</sup> Moreover, Saudi Arabia has a free healthcare system for both citizens and non-citizens. During the COVID-19 pandemic, King Salaman Al-Saud also enacted a law that included non-citizens to receive the COVID-19 vaccine and the necessary medical care if diagnosed with COVID-19.<sup>26</sup>

Influenza poses a major threat to people worldwide. Influenza can easily cause mild symptoms that do not require hospitalization. However, some cases are severe and sometimes fatal owing to a lack of awareness of prevention methods such as vaccination.<sup>24</sup> The overarching purpose of this study was to examine the intention of the Saudi population to use the influenza vaccine as a preventive measure during the COVID-19 pandemic.

### Limitations

This study has three limitations. First, the study sample comprised visitors from two shopping malls in Jeddah. Jeddah is considered a multicultural city, and most people are educated and are accustomed to a more open culture than in other cities in Saudi Arabia. Collecting data from diverse regions within the Kingdom of Saudi Arabia could have yielded varying outcomes in terms of the population's knowledge levels and intentions regarding influenza vaccination. Second, although the sample size included the entire population, it was still too small for a robust power. It is also impossible to generalize these results to the entire Saudi population.

Furthermore, demographic variables (age,

experience, work setting, and level of education) were tested to determine any relationships between them and the population's intention to receive the influenza vaccine. The results revealed no significant relationship between any demographic variable and the population's intention to receive the influenza vaccine.

This study provides evidence that the Saudi population has sufficient knowledge about the influenza vaccine; however, a deeper understanding of subjective norms is needed to promote influenza prevention methods. Future research is necessary to improve education and remove obstacles to access influenza prevention methods.

### CONCLUSION

This study aimed to determine whether the pandemic affected people's decisions to receive the influenza vaccine. Notably, this study was carried out amidst the ongoing COVID-19 pandemic. The results showed that COVID-19 had little effect on the individual's decision to receive influenza vaccine. Our findings also show that the Saudi population is knowledgeable regarding the importance of influenza vaccines.

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None.

### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

### AUTHORS' CONTRIBUTION

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

### FUNDING

None.

### DATA AVAILABILITY

All datasets generated or analyzed during this study are included in the manuscript.

### ETHICS STATEMENT

This study was approved by the Institutional Ethics Committee, University of

Jeddah, Saudi Arabia, with reference number HAP-02-J-091.

## INFORMED CONSENT

Written informed consent was obtained from the participants before enrolling in the study.

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