# The Attitude of Health Care Providers in Saudi Arabia to Covid-19 Vaccine and Implementing Preventive Measures

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## Abstract

Aim: This study would be the first of its kind in the Kingdom of Saudi Arabia, mainly to evaluate the willingness of the community to be vaccinated against the COVID-19 virus, assess attitudes towards continuing to use protective measures after getting vaccinated, and to continue to monitor changes in the spread of the COVID 19 virus after implementation of vaccination.

Method: This is a cross-sectional study, questionnaire-based survey. The study includes 302 participants from Makkah region of Saudi Arabia. Statistical analysis was performed using descriptive statistical analysis.

Result: Out of 302 participants in the research the age 21-30 was 44.4%. 61.6% of the respondents took the vaccine, and 95.4% of them want to keep using the protective measures after receiving the vaccine.

Conclusion: Healthcare providers and co-workers are willing to receive the COVID-19 vaccine. Still, we strongly recommend that healthcare providers need more preparation and an evidence-based approach to address the safety and efficacy of the vaccines in the community and build and maintain public trust in the vaccine.

Keywords: Health care providers, COVID-19, Vaccination, Protective measures.

## Background

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or coronavirus disease 2019 (COVID-19) has spread internationally since December 2019, becoming a massive pandemic and world crisis. The first case of COVID-19 in Saudi Arabia was detected in Qatif in an individual who had traveled to the endemic region of Iran (1). Due to the fast-spreading nature of the COVID-19 pandemic, the world continues to observe measures to prevent further spread by various means, such as social distancing, wearing masks and face shields, preventing crowding, and working from home when possible. Introduction and implementation of COVID-19 vaccination is relatively new and has only been available to a very small portion of the world population so far. We are performing a qualitative study using primary data to get insight into how the attitude towards implementing preventive measures varies among people who have received the vaccination.

The COVID-19 vaccine, an mRNA vaccine produced by Pfizer, was first made available in December 2020. Both the Pfizer and Moderna vaccines are lipid nanoparticle coated mRNA vaccines that code for the coronavirus spike protein. This mRNA is processed by the recipient's ribosomes to produce the spike protein which subsequently induces an immune response that renders the recipient immune to the virus. Recently, the AstraZeneca vaccine, a modified adenovirus DNA vaccine, has been approved in Saudi Arabia. Currently not enough data exists to inform us about the behavioral change towards preventive measures among individuals who have received the vaccination. However, such information is crucial to predict the response of the remaining vast majority of people as they continue to vaccinate. The responses will impact how people view the pandemic-related lockdowns, travel restrictions, social gatherings ban, fear of getting diseases, and therefore overall the global economy. It may also provide a sense of security that can prove harmful towards individuals who are not vaccinated yet. The fact that the first set of vaccines was provided majorly to health care workers across the world can skew the data towards behavior of one type of population group and may not reflect the behavior of the common population.

## Literature Review

Public perception towards vaccination has a direct effect upon vaccine uptake and therefore pandemic recovery. Many people have negative views regarding the COVID-19 vaccine, and such ideas have been spread through social media since the beginning of this pandemic. The medical and economic implications of a negative public perception towards vaccination can only be understood after studying and quantifying the prevalence of such perceptions. Since the beginning of this pandemic, many studies have been conducted in various countries that shed light on local public perceptions and predict future vaccination uptake.

A cross sectional survey conducted in April 2020 in the United States asked participants "When a vaccine for the coronavirus becomes available, will you get vaccinated?". The authors reported that 3 in 10 adults weren't sure if they would accept the vaccine, while 1 in 10 didn't intend to get vaccinated (2). Another U.S. study reported that 67% of respondents would accept a COVID-19 vaccine (3). A study in the UK reported that 14% of respondents were unwilling to take the vaccine, while 23% weren't sure (4). Another study done in the UK and Ireland reported that vaccine hesitancy/resistance rate was 31% and 35% for these populations respectively (5). Similar numbers were reported in other European studies. Most of these studies also investigated the determinants of vaccine hesitancy and resistance. Income, race, political affiliation, educational level, and geographic location were all contributing factors, but the most consistently reported determinant is previous influenza vaccination. The rates of vaccine acceptance vary from country to country however. A Chinese study reported that parental acceptance of COVID-19 vaccination for their child was 72.6% (6). In contrast, an alarming Jordanian study reported that only 37.4% of participants would accept a COVID-19 vaccine (7). If such rates were to be translated into vaccine uptake, herd immunity for this virus would not be achievable. As such disparities in vaccine acceptance exist between countries, it is therefore imperative that the attitudes towards COVID-19 vaccination and the determinants of vaccine resistance be investigated in every population group.

**Rationale:**
The challenges are made worse by the unpredictable increase of the epidemics. In this research we are keen to study the attitude of the targeted health care provider and behavior toward this serious condition especially with the huge influence of the social media globally on the decision-making.

**Aim:**
This study would be the first of its kind in the Kingdom of Saudi Arabia, mainly to evaluate the willingness of the community to be vaccinated against the COVID-19 virus, assess attitudes towards continuing to use protective measures after getting vaccinated, and continue to monitor changes in the spread of the COVID 19 virus after implementation of vaccination.

**Objectives:**
To provide essential attitude of the health care provider in Saudi Arabia toward a covid-19 vaccine and to identify factors predictive of a range of negative attitudes towards vaccines, and uncertainty and lack of intent to vaccinate against COVID-19, as well as to evaluate the impact of various socio-economic factors that cause this reaction against the covid-19 vaccine. Finally, to understand the basic knowledge of the population of the possibility of getting or/and transmitting the infection after vaccination.

## Methodology

**Study Design:** This is a cross-sectional study among health care providers in Saudi citizens and residents.

**Study Population:** Health care providers in the Saudi health care facilities

**Eligibility Criteria:** Exclusive criteria under age of 16

**Study Area:** Makkah Region

**Sample Size:** 302

**Sample Technique:** Simple random

**Data Collection:** Data was collected in March 2021. A structured questionnaire was developed to cover the research objectives. Validity was reviewed by selected healthcare experts and professionals and tested on a sample of the target population.

**Variables:** The dependent variable in this study was using the protective measures against covid-19 and the willingness to be vaccinated against the virus. The predisposing variables are age, sex, marital status, nationality, residency, education level, past history of medical disease, history of vaccination against covid-19, type of protective measures used.

**Socio-demographic variables:**
- **Age** of the participants at the time of the interview was recorded in complete years and identified as under 16, 16-20, 21-30, 31-40, 41-50, 51-60, and above 60.
- **Sex** was defined as Male or Female
- **Marital Status** was defined as: married, divorced or widowed.
- **Nationality** was defined as: Saudi, Non-Saudi.
- **Education** was defined as a completed level: primary education, diploma, graduate, post graduate.
- **Occupation** was defined as: Nurse, Physician, and Administrative, other.
- **Past History of Medical Disease** was defined as: Hypertension, Diabetes, Allergy, Asthma, other, and None.
- **History of vaccination** against covid-19 defined as: vaccinated, not vaccinated.
- **Type of Protective Measures Used** defined as: wearing mask, washing hands or wearing gloves, keep social distance, and Limit social gatherings and time spent in crowded places.
- **The Possibility of Transmitting the COVID-19** defined as: Yes/No.

**Data analysis:** In the present study, statistical analysis using "IBM SPSS statistics ver. 20.0" was applied to evaluate and test the hypothesis. The level $P<0.05$ was used as the cut-off value for significance.

## Results

Three hundred and two respondents were included in the study from health care facilities in the Makkah region; most of them were between the age of 21-30 years old with 44.4%, there were no mean gender differences, 66.2% were single, 86.1% were Saudi, 52% of them had a bachelor degree. In addition to that 4.3% were nurses, 38.4% were physicians, 10.9% were administration, and 46.4% were others. Furthermore, of most of the respondents, 73.5% have no chronic disease (Table 1). Besides that, 61.6% of them were vaccinated at the time of the data collection, while 38.4% were not. Additionally, 95.4% of the respondents were willing to use the protective measures even after receiving the vaccine (Table 2). Most of the protective measures were wearing masks 91.7%, washing hands 85.8%, keeping social distance 80.5%, limiting social gathering 71.5%, and the least recorded was wearing gloves with 31.1% (Figure 1). Most importantly, of the respondents, 82.4% were using at least three protective measures (Table 3). Moreover, 89.1% of the respondents believe vaccines are ineffective, and 70.5% are still afraid of getting the COVID-19 infection.

To identify factors predictive of a range of negative attitudes towards vaccines and lack of intent to vaccinate against COVID-19; a relationship was made between those who didn't receive the vaccine versus the causes of the implementing protective measures after receiving the vaccine which shows a significant association [P-value =.16] for those who think the vaccine is not effective and [ P-value<0.001] as they feel safer to keep using the protective measures (Table 5).

To evaluate the impact of various socio-economic factors that cause this reaction against the covid-19 vaccine, a relationship between those who receive the vaccine versus socio-economic variables shows a significant association with age, marital status, education, and occupation (Table 6).

Finally, 70.5% of all respondents think that they are prone to transmit COVID-19 infection after receiving the vaccine (Table 7).

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Age | 1 to under 16 | 33 | 10.9 | 10.9 | 10.9 |
| | 16-20 | 52 | 17.2 | 17.2 | 28.1 |
| | 21-30 | 134 | 44.4 | 44.4 | 72.5 |
| | 31-40 | 54 | 17.9 | 17.9 | 90.4 |
| | 41-50 | 19 | 6.3 | 6.3 | 96.7 |
| | above 50 | 10 | 3.3 | 3.3 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| Gender | male | 145 | 48.0 | 48.0 | 48.0 |
| | females | 157 | 52.0 | 52.0 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| Marital Status | Single | 200 | 66.2 | 66.2 | 66.2 |
| | Married | 90 | 29.8 | 29.8 | 96.0 |
| | Divorced or Widower | 12 | 4.0 | 4.0 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| Nationality | Saudi | 260 | 86.1 | 86.1 | 86.1 |
| | Non-Saudi | 42 | 13.9 | 13.9 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| Education | Less than high school | 46 | 15.2 | 15.2 | 15.2 |
| | High School Diploma | 47 | 15.6 | 15.6 | 30.8 |
| | College Diploma | 13 | 4.3 | 4.3 | 35.1 |
| | Bachelor | 157 | 52.0 | 52.0 | 87.1 |
| | Masters/ PhD | 39 | 12.9 | 12.9 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| Occupation | Nurse | 13 | 4.3 | 4.3 | 4.3 |
| | Physician | 116 | 38.4 | 38.4 | 42.7 |
| | Administrative | 33 | 10.9 | 10.9 | 53.6 |
| | Other | 140 | 46.4 | 46.4 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| History of Chronic Disease | None | 222 | 73.5 | 73.5 | 73.5 |
| | Allergy | 28 | 9.3 | 9.3 | 82.8 |
| | Asthma | 24 | 7.9 | 7.9 | 90.7 |
| | Diabetes | 9 | 3.0 | 3.0 | 93.7 |
| | Hypertension | 12 | 4.0 | 4.0 | 97.7 |
| | other | 7 | 2.3 | 2.3 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |

Table (1): Socio-economic Variables.

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Vaccination profile | no | 116 | 38.4 | 38.4 | 38.4 |
| | yes | 186 | 61.6 | 61.6 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |

Table (2): Vaccination-Profile

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Protective measure application after vaccination | No | 14 | 4.6 | 4.6 | 4.6 |
| | yes | 288 | 95.4 | 95.4 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |
| How many protective measures you are using/ | 0 | 4 | 1.3 | 1.3 | 1.3 |
| | 1 | 26 | 8.6 | 8.6 | 9.9 |
| | 2 | 23 | 7.6 | 7.6 | 17.5 |
| | 3 | 53 | 17.5 | 17.5 | 35.1 |
| | 4 | 122 | 40.4 | 40.4 | 75.5 |
| | 5 | 74 | 24.5 | 24.5 | 100.0 |
| | Total | 302 | 100.0 | 100.0 | |

Table (3): willing to use the protective measures after receiving the vaccine

| Why do you think implementing of this measure after receiving the vaccine is important? | no | | yes | |
|---|---|---|---|---|
| | Count | Table N % | Count | Table N % |
| I think vaccine is not effective. | 269 | 89.1% | 33 | 10.9% |
| I think it is safer to keep using it | 99 | 32.8% | 203 | 67.2% |
| Because it is the government instruction. | 172 | 57.0% | 130 | 43.0% |
| I'm still afraid of the COVID19. | 213 | 70.5% | 89 | 29.5% |

Table (4): the importance of implementing the protective measures.

| Why do you think implementing of this measure after receiving the vaccine is important? | Did you receive the COVID-19 vaccine? | P-Value |
|---|---|---|
| | no | |
| I think vaccine is not effective. | 19 | =0.16 |
| | 57.6% | |
| I think it is safer to keep using it | 29.1% | <0.001 |
| | 116 | |
| Because it is the government instruction. | 39.2% | > 0.05 |
| | 116 | |
| I'm still afraid of the COVID19. | 38.2% | > 0.05 |
| | 116 | |

Table (5): didn't receive the vaccine versus the causes of the implementing the protective measures after receiving the vaccine

**Table (6): Socio-economic Variables Vs who received the vaccine**

| | | Did you receive the COVID-19 vaccine? | | Total | P-Value |
|---|---|---|---|---|---|
| | | no | yes | | |
| Age | under 16 | 26 | 7 | 33 | <0.001 |
| | | 22.4% | 3.8% | | |
| | 16-20 | 41 | 11 | 52 | |
| | | 35.3% | 5.9% | | |
| | 21-30 | 29 | 105 | 134 | |
| | | 25.0% | 56.5% | | |
| | 31-40 | 12 | 42 | 54 | |
| | | 10.3% | 22.6% | | |
| | 41-50 | 5 | 14 | 19 | |
| | | 4.3% | 7.5% | | |
| | above 50 | 3 | 7 | 10 | |
| | | 2.6% | 3.8% | | |
| Gender | Male | 53 | 92 | 145 | >0.05 |
| | | 45.7% | 49.5% | | |
| | Female | 63 | 94 | 157 | |
| | | 54.3% | 50.5% | | |
| Marital Status | single | 100 | 100 | 200 | <0.001 |
| | | 86.2% | 53.8% | | |
| | married | 13 | 77 | 90 | |
| | | 11.2% | 41.4% | | |
| | Divorced or Widower | 3 | 9 | 12 | |
| | | 2.6% | 4.8% | | |
| Nationality | Saudi | 97 | 163 | 260 | >0.05 |
| | | 83.6% | 87.6% | | |
| | Non-Saudi | 19 | 23 | 42 | |
| | | 16.4% | 12.4% | | |
| Education | Less than high school | 43 | 3 | 46 | <0.001 |
| | | 37.1% | 1.6% | | |
| | High School Diploma | 30 | 17 | 47 | |
| | | 25.9% | 9.1% | | |
| | College Diploma | 4 | 9 | 13 | |
| | | 3.4% | 4.8% | | |
| | Bachelor | 33 | 124 | 157 | |
| | | 28.4% | 66.7% | | |
| | Masters/ PhD | 6 | 33 | 39 | |
| | | 5.2% | 17.7% | | |

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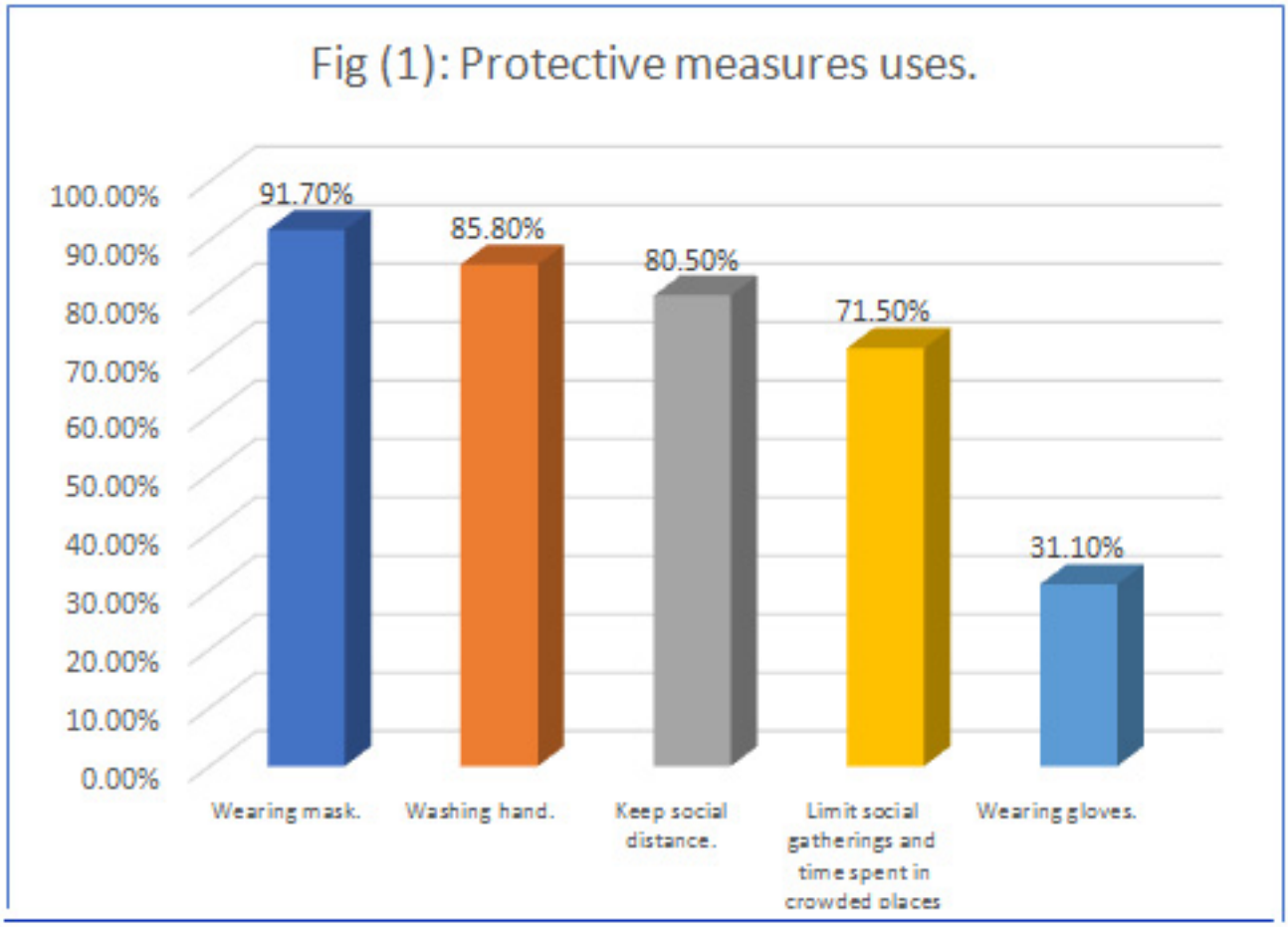
Table (6): Socio-economic Variables Vs who received the vaccine continued

| | | | | | |
|---|---|---|---|---|---|
| Occupation | Nurse | 5 | 8 | 13 | <0.001 |
| | | 4.3% | 4.3% | | |
| | Physician | 23 | 93 | 116 | |
| | | 19.8% | 50.0% | | |
| | Administrative | 7 | 26 | 33 | |
| | | 6.0% | 14.0% | | |
| | Other | 81 | 59 | 140 | |
| | | 69.8% | 31.7% | | |
| History of chronic disease | None | 84 | 138 | 222 | |
| | | 72.4% | 74.2% | | |
| | Allergy | 13 | 15 | 28 | |
| | | 40.6% | 31.2% | | |
| | Asthma | 11 | 13 | 24 | |
| | | 34.4% | 27.1% | | |
| | Diabetes | 2 | 7 | 9 | |
| | | 22.2% | 14.6% | | |
| | Hypertension | 3 | 9 | 12 | |
| | | 6.2% | 18.8% | 100.0% | |
| | Other | 3 | 4 | 7 | |
| | | 9.4% | 2.2% | 100.0% | |

Table (6): Socio-economic Variables Vs who received the vaccine

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Do you thinkthat you can transmit COVID-19 after vaccination? | no | 89 | 29.5 | 29.5 | 29.5 |
| | yes | 213 | 70.5 | 70.5 | 100.0 |

Table (7): transmitting COVID-19 after receive the vaccine.




## Discussion

Our cross-sectional study examines healthcare workers' knowledge, attitude, and acceptance of COVID-19 vaccination in the Makkah region in Saudi Arabia. Our results showed that a large number of respondents are accepting to be vaccinated. Nevertheless, the adverse effects of all vaccines are not well elaborated. The lack of confidence about the vaccine causes was why the respondents wanted to use the protective measures despite their vaccination status. This is compatible with another cross-sectional study in the eastern region of Saudi Arabia among 236 participants who showed that the acceptance rate for the COVID-19 vaccine was average among health care providers (8). Vaccine acceptability was higher among several socio-economic factors like age, marital status, education, and occupation.

The rapid evolution of the COVID-19 situation worldwide and in Saudi Arabia makes it challenging for healthcare systems to adapt and hesitant health providers to receive the COVID-19 vaccine. Although developing several COVID-19 vaccines in less than a year, it is unlikely that any vaccines will be effective at stopping the transmission of infection. There is a small risk of breakthrough infection (9). This may explain the hesitancy of respondents against the vaccine and the reason for keeping use of protective measures against it. Moreover, this study shows sufficient knowledge of the possibility of transmitting the COVID-19 vaccine even after vaccination. Still, new studies showed that COVID-19 transmission after full vaccination reduced and decreased the symptoms for those who get the infection (9-11), which made the crucial role of protection against Covid 19 not using protective measures.

Our study shows that COVID-19 vaccine acceptance can be predicted with relatively high accuracy by readily available demographic characteristics. However, we must be cautious, assuming that reported acceptance or intent translates into actual behavior. This is primarily a concern when there is some time between the measurement of intention and the observation of behavior, as some may explicitly reference scientifically inaccurate information. Nevertheless, building confidence in a COVID-19 vaccine is essential to offer protection, improve the immune system, and make the body more capable of resisting the infection.

Coronavirus vaccine, together with measures to stop viruses spreading, like social distancing, are the best way to protect yourself and the community from Covid-19, as they provide strong protection against serious illness, hospitalization, and death (1). It is crucial to encourage the community to take the vaccine of COVID-19 and enhance awareness that the vaccines are an essential tool to stop the pandemic and protect the body.

## Conclusion

Healthcare providers and co-workers are willing to receive the COVID-19 vaccine. Still, we strongly recommend that healthcare providers need more preparation and an evidence-based approach to address the safety and efficacy of the vaccines in the community and build and maintain public trust in the vaccine.

**Recommendation:**
To build up a well-planned media and enhance a positive campaign to share scientific information with the community in terms of epidemiological details of how the vaccine reduces transmission, scientific facts of in whom it erases the symptoms and decreases the chances of hospitalization, and the methodological process of the vaccine to address misinformation that may encourage receiving of the vaccine.

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