

# Acceptance and Attitude toward COVID-19 Vaccination among the Public in Saudi Arabia: A Cross-sectional Study

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## ABSTRACT

**Aim and objective:** This cross-sectional study aimed to investigate vaccine acceptance and attitude to novel coronavirus disease 2019 (COVID-19) vaccine among the general population in Saudi Arabia.

**Materials and methods:** The present study was conducted among the general population in Saudi Arabia above 18 years of age. The data were collected online, by questionnaire containing 20 questions using Google form, in both Arabic and English, and were distributed to friends, families, and relatives through mail, WhatsApp groups, and Twitter. The questionnaire was randomly given out to the people living in five provinces of Saudi Arabia.

**Results:** A sum of 1,713 participants responded to the online survey. The greatest number of participants were at the age between 31 years and 45 years (36.6%) and 56.4% were females. The results showed that 74.6% have not registered for the vaccination and 44.9% responded not to take the vaccine. About 60.80% were concerned about the side effects, and 48.2% were worried about the allergic reaction to COVID-19 vaccine. About 49.1% of participants agreed that preventive measures, such as wearing mask, social distance, and using sanitizers, keep the virus away, and 53.20% believes that being exposed to disease naturally is safer for the immune system. Around 23.90% believes that vaccination cannot reduce the possibility of getting COVID-19.

**Conclusion:** In the present study, the negative attitudes and afraid of the side effects of the vaccine are the most reasons for indecision and rejection about COVID-19 vaccine. For the future COVID-19 vaccination campaign not to fail, the Ministry of Saudi Arabia should closely follow the vaccination development processes, inform the public transparently, and consider public's concerns.

**Clinical significance:** The results of the current study will help the Ministry of Health in Saudi Arabia to attempt proactive missions by featuring the significance of immunization to the population and empowering vaccine take-up and acceptance.

**Keywords:** Acceptance, Attitude, COVID-19, Saudi Arabia, Vaccination.

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## INTRODUCTION

Coronavirus disease-2019 (COVID-19) infection, which the World Health Organization (WHO) has declared a global pandemic, caused a widespread impact on health, including substantial mortality, repercussions for the global economy caused by physical distancing measures, with the greatest consequences for the most vulnerable in society.<sup>1</sup> Since the first case of COVID-19 in Saudi Arabia was detected on Monday, March 2, 2020, the Saudi Ministry of Health vigilantly monitored the situation and developed country-specific measures, like social distancing, hand washing, wearing masks, and lockdown procedures, in line with the WHO guidelines in dealing with the outbreak.<sup>2</sup>

The long-term success of the public prevention efforts to the COVID-19 will depend on acquired immunity in a sufficient proportion of the population (herd immunity), which is estimated to be 67% for COVID-19.<sup>3</sup> The vaccines are known to be effective in creating a long-lasting immune memory to control and prevent the disease and reducing the ongoing health crisis.<sup>4</sup> In response, rapid global efforts were made to develop and test vaccines against SARS-CoV-2. Vaccines typically require years of research and testing before reaching the clinic, but in 2020, scientists embarked on a race to produce safe and effective coronavirus vaccines in record time. More than 60 vaccines are still going through a three-stage clinical trial process that is required before they are sent to regulatory agencies for approval. Given the urgent need, some vaccines like Pfizer/BioNtech, Moderna,

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and Oxford/Astra Zeneca have been introduced in the market by compressing the clinical process for SARS-CoV-2 and running trial phases simultaneously.<sup>5</sup>

Despite the extraordinary speed of scientific discovery regarding COVID-19, there are still a lot of uncertainties and concerns on novel vaccines in terms of safety and effectiveness. A recent global survey suggested that nearly 30% of participants hesitate to take a COVID-19 vaccine when it becomes available.<sup>6</sup> The unwillingness and uncertainty about receiving a COVID-19 vaccine will be a significant challenge in achieving the vaccination coverage required for population immunity. Concerns identified to date for intending not to receive the COVID-19 vaccine include worries about the newness and safety of the vaccine as well as about potential side effects.<sup>7,8</sup>

Saudi Arabia launched its coronavirus vaccination campaign on December 17, 2020, after receiving the first shipment of the Pfizer-BioNTech vaccine.<sup>9</sup> The people were asked to register for the vaccine through the “SEHATY” (MY HEALTH) online application and were made free for the citizens and residents in Saudi Arabia. Henceforth, it is significant to investigate the acknowledgment of COVID-19 vaccines and their indicators just as perspectives toward COVID-19 vaccines among people in Saudi Arabia. The aim of the present study is to assess the vaccine acceptance and attitude to novel COVID-19 vaccine among the general population in Saudi Arabia.

The results of the current study could assist the Ministry of Health in Saudi Arabia to attempt proactive missions and very much planned techniques by featuring the significance of immunization to the population and empowering vaccine take-up and acceptance, to improve the immunity furthermore, and to restrict the spread of the pandemic.

## MATERIALS AND METHODS

### Study Design and Participants

The present cross-sectional study was conducted among the general population of Saudi Arabia, from January 7, 2021, to January 26, 2021. The data were collected online, by questionnaire using Google form, in both Arabic and English, and were distributed to friends, families, and relatives through mail, WhatsApp groups, and Twitter. The background and objectives of the study were mentioned in the beginning of the questionnaire and were informed that all the information's provided would be anonymous and confidential. The questionnaire was randomly distributed to the people living in five provinces of Saudi Arabia. People aged 18 years or older who can understand the content of the questionnaire and who agreed to participate in the study were asked to complete the questionnaire and online informed consent was obtained before proceeding with the questionnaire.

### Study Instrument

The questionnaire to be used in the research was prepared based on the literature review and discussion by the researchers and there are 20 questions in total. The questionnaire contains seven questions for sociodemographic characteristics (gender, age, occupation, etc.) and questions for health conditions. Respondents were asked to inform if they were tested for COVID-19 or any one of their family members was infected with COVID-19. The attitudes and perceptions toward COVID-19 vaccine were assessed by asking 10 questions. The questionnaire required an expected time of 2–3 minutes to finish.

### Ethical Considerations

The study was approved by the Ethical Committee, (DRC/0020FA/21) Ar Rass Dental College, Qassim University, Saudi Arabia.

### Statistical Analysis

The data analysis was performed using Microsoft Excel 2019 and SPSS version 25.0 (Chicago, Illinois, USA). Microsoft Excel was used for editing, sorting, and coding. The excel file was then imported into SPSS software. Descriptive statistics were calculated for demographic factors and answers toward attitudes toward COVID-19 vaccine.

## RESULTS

### Study Population

The study was limited for a period of 3 weeks and till that duration, 1,728 people responded and in that 15 (0.9%) respondents did not give the informed consent and failed to complete the questionnaire and were excluded and the data were calculated from 1,713 (99.13%) participants.

The greatest number of participants were at the age between 31 years and 45 years (36.6%) and more than half of them (56.4%) were females. Nearly all respondents (>98%) were Saudi citizens and most of the participants (53.10%) were from the central province.

Of the participants, 85.30% were nonhealth workers and 75.3% does not have any health problems, 11.8% are diabetics, 10.1% are hypertensive, 7.6% with respiratory problems, and 2.5% with cardiac problems. Detailed sociodemographic characteristics of participants are in Table 1.

Almost half of the participants (49%) have done the COVID-19 test, only 9.2% of them were positive for COVID-19, and 55.5% of respondents reported that none of their family members were infected with COVID-19 (Fig. 1).

### Attitudes toward Novel COVID-19 Vaccine

The COVID-19 vaccine was made free for all the people in Saudi Arabia and the ministry opened an online application, in which the people must register for the vaccination. The people were encouraged to take the vaccine but was not made compulsory.

**Table 1:** Demographic details of study participants

<b>Age (years)</b>	
18–30	29.25%
31–45	36.60%
46–60	19.20%
61–75	13.06%
Above 76	1.89%
<b>Gender</b>	
Male	43.60%
Female	56.40%
<b>Nationality</b>	
Saudi	98.2%
Non-Saudi	1.80%
<b>Educational level</b>	
Doctorate	15%
Masters	39%
Bachelors	29%
High school	11%
Others	6%
<b>Profession</b>	
Health workers	14.70%
Nonhealth workers	85.30%
<b>Province</b>	
Central	53.10%
Eastern	21.29%
Western	14.22%
Northern	9.06%
Southern	2.88%

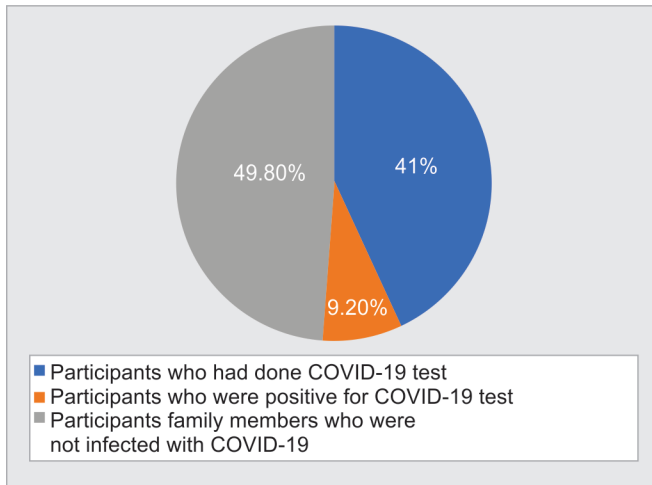


Fig. 1: COVID-19 test

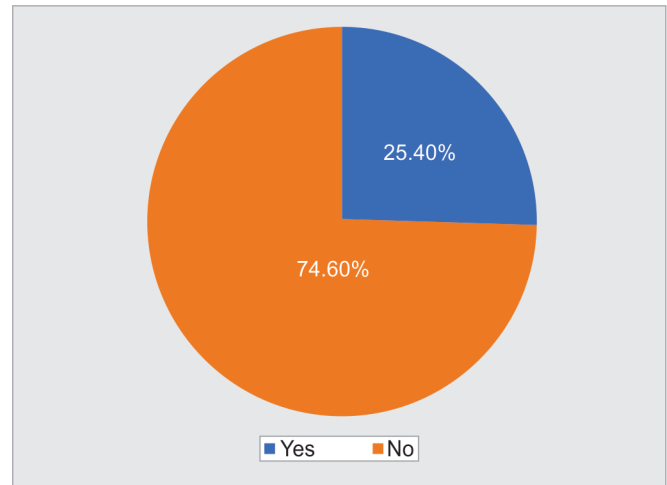


Fig. 2: Registration for COVID-19 vaccine

When asked about the registration for vaccination, it was found that 74.6% (almost three-quarter) have not registered for the vaccination yet (Fig. 2), and 44.9% responded that they prefer not to take the vaccine while 55.1% of participants agreed to take the vaccine, even if it is not mandatory.

About 60.80% of respondents were concerned about the side effects of COVID-19 vaccine in future, 61% were scared of injection, and 48.2% were worried about the allergic reaction to COVID-19 vaccine.

Almost half (49.1%) of participants agreed that vaccination is not needed as preventive measures, such as wearing mask, keeping social distance, and using sanitizers, keep the virus away, and 53.20% believe that being exposed to disease naturally is safer for the immune system than being exposed through vaccination. In addition to this, 23.90% believes that vaccination cannot reduce the possibility of getting COVID-19 and 48.39% is not sure about the duration of protection after being vaccinated, so have not decided about taking vaccination.

Moreover, the results of this study showed that 55.70% of participants are not confident in vaccine as it is new and produced in a short span of time, and about 44% agreed that the vaccine will not be effective for those who are already infected with COVID-19. Figure 3 shows the response for the questionnaire toward COVID-19 vaccine.

## DISCUSSION

COVID-19 is an emerging infectious disease that poses a significant threat to public health. There is an urgent and important need to manufacture and distribute enough safe and effective vaccine to immunize individuals to protect the entire global community from the threat of morbidity and mortality from COVID-19 infection.<sup>10</sup>

The importance of knowledge about vaccines and attitude toward vaccination has become essential in the previous few months. This is the first kind of study done in Saudi Arabia to assess the attitude of the public toward the novel COVID-19 vaccine after the introduction of vaccine. Our study investigated the attitude toward COVID-19 vaccination in a population of 1,698 respondents, mainly from the central province. While this is a limited sample size, these data may be considered representative.

In the present study, most of the participants were between 31 years and 45 years of age (36.6%) and 56.4% were females. Our

study showed that 76.40% of respondents did not register for the vaccination, and 44.9% are not willing to take the vaccine and 55.1% of participants agreed to take the vaccine.

Though there have been limited studies to explore the intention to uptake the COVID-19 vaccine in the current crisis, the study conducted by Elimat et al.<sup>11</sup> also showed that public adequacy of COVID-19 immunizations was genuinely low (37.4%) in Jordan.

Fue et al.<sup>12</sup> reported that 72.5% of Chinese general population's intention to uptake COVID-19 vaccine and Thunstrom et al.<sup>13</sup> who conducted a study in the United States reported 80% acceptance of the COVID-19 vaccine among the study population.

A survey based on a representative from 19 countries involving 13,426 contributors showed that the worldwide acquiring of COVID-19 immunizations is less than 54.80% from Russia to more than 88.60% from China.<sup>14</sup>

Vaccine history was the most important predictor of the intent to receive a COVID-19 vaccine, a factor that reflects confidence in vaccines in general. The low acknowledgment level of COVID-19 vaccines among people in Saudi can be due to different causes, some of which are imparted to the wide worldwide group.

The current study confirmed about the negative attitudes toward vaccination such as side effects of vaccine and worried about getting to be injected. This is in accordance with Pogue et al. discovery, where large portions of contributors (63%) in the USA expressed that they were concerned over the symptoms of the COVID-19 vaccines.<sup>15</sup> Studies conducted by Palamenghi et al.<sup>16</sup> and Wang et al.<sup>17</sup> suggest that the level of reluctance to vaccinate against COVID-19 is higher than vaccine hesitancy for usual vaccines in several countries.

As the vaccine is new and produced in a short span of time, 55.70% of participants in the current study are not confident and 44% believes that the vaccine will not be effective for those who are already infected with COVID-19. The present study showed that 48.39% are not sure about the duration of protection after being vaccinated and 23.90% believes that vaccination cannot reduce the possibility of getting COVID-19.

The pace of COVID-19 vaccine improvement and enlistment in under a year may have played a role in decreasing the acquiring level. The speed of antibody improvement and enlistment in under a year may have interceded a job in bringing down the acknowledgment level.

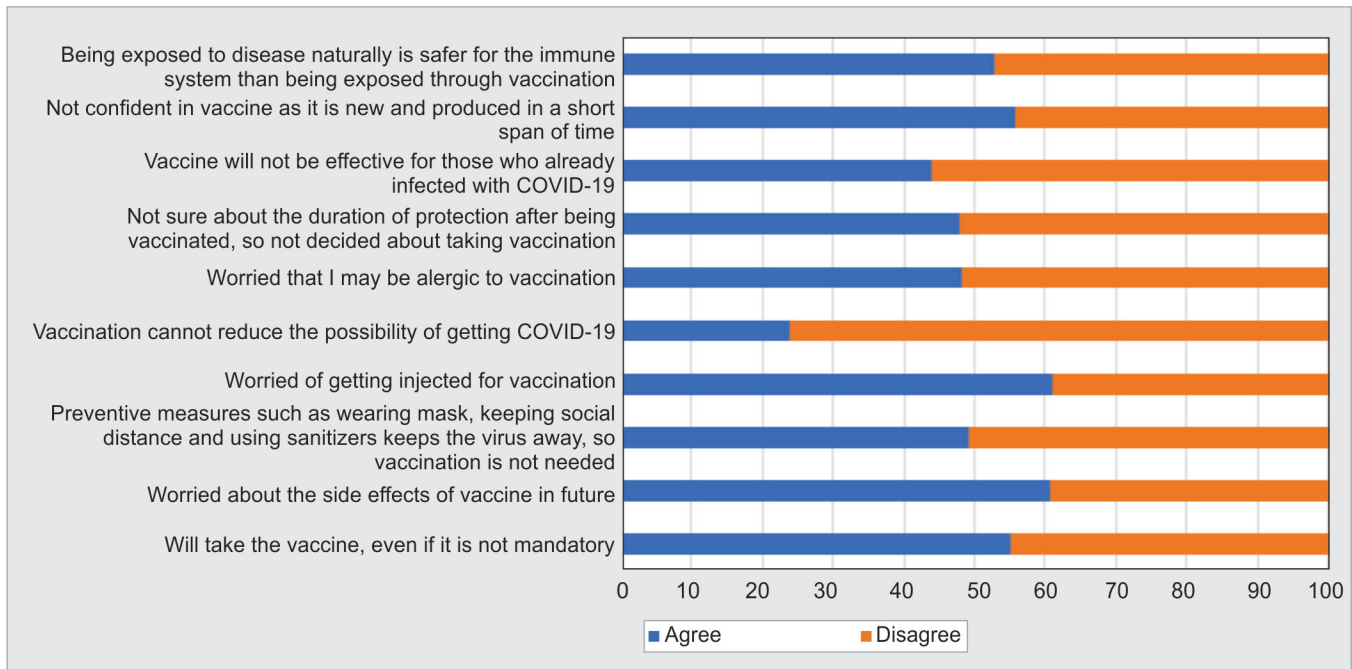


Fig. 3: Attitudes toward COVID-19 vaccine

Another worldwide phenomenon that added to a low acceptance level is the various missions dispatched by antivaccinationists. Such missions via web-based media with manufactured, bogus, and at times misdirecting Arabic interpretations feed the planned belief of specific individuals.

It is pivotal to disperse straight forward and precise data about vaccines’ protection and adequacy to acquire the faith of the people particularly the reluctant and incredulous ones.<sup>18</sup> Hence, acquiring an understanding of the assets that individuals trust the most to get data about COVID-19 vaccines is basic for the achievement of any future public vaccination campaign.

As alternatives to vaccines, 49.1% of respondents in our study preferred general “natural” methods, such as wearing mask, keeping social distance, and using sanitizers, keep the virus away and 53.20% believe that being exposed to disease naturally is safer for the immune system than being exposed through vaccination.

While these are general preventive measures, the lockdown caused by the coronavirus pandemic and the ensuing fatigue proves that these measures work only for a limited amount of time before negatively impacting society.<sup>19</sup>

The current pandemic entails three important challenges for public confidence in and uptake of a future, licensed vaccine. First, the evidence showed that if a new vaccine is introduced, the level of hesitancy will be high.<sup>20</sup> Second, the people’s trust over the vaccine will take time, and finally, the challenge against the misinformation by antivaccination campaigners.<sup>21</sup>

The major limitation of the study was the short duration, so as to know the public’s initial attitude toward COVID-19 vaccine. After the survey was finished and at the time of submission of the manuscript, we found an increased awareness among the public and more people were accepting the COVID-19 vaccine. The reason for the sudden change in attitude toward vaccine was due to great effort by the Ministry of Health, Saudi Arabia, in spreading most valid data’s about COVID-19 vaccines, planned involvement in terms of alertness movements through a wide range of interactive

media to circulate more straightforward data about the protection and potency of the vaccines, opened more vaccination centers, drive through vaccinations, and even made vaccine available at the doorsteps for the bedridden peoples.

### CONCLUSION

Throughout this study, we found an initial reluctance toward COVID-19 vaccine among public people in Saudi Arabia. Investigating sociodemographic and psychosocial factors that affect vaccine acceptance is fundamental for an effective immunization plan. In the meantime, an efficacious vaccine has the potential to have a major impact on the pandemic if used in populations at the proper time.

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