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Psychological Factors Behind Taking the Coronavirus COVID-19 Vaccine and Associated Symptoms for a Sample of People in Saudi Arabia

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Abstract---The study aimed to examine the psychological factors behind taking the COVID-19 vaccine and the associated symptoms for a sample of people in Saudi Arabia. The descriptive approach was used. The questionnaire was applied to collect data from a sample of (520) members of the Saudi community who received the COVID-19 vaccine (three doses) in Najran, Saudi Arabia in the year 2022. Their ages ranged between (20-50) years. The sample was selected following the convenience method from different classes of society (students, employees). The results showed statistically significant differences between the distribution of the observed and expected values of the study sample's responses about the psychological factors behind taking the coronavirus COVID -19 vaccine, and in favor of the observed values (yes). The most important psychological factors were as follows: collective responsibility, restrictions, trust, conviction, and credit. Also, it was shown that the most common and frequent symptoms in the first, second, and third doses, respectively: pain, swelling and redness at the vaccination site, high fever, body pain and fatigue. However, symptoms such as vomiting, diarrhea and headache.

Keywords---associated symptoms, COVID-19 vaccine, psychological factors, Saudi Arabia.

Introduction

Over the different ages, humans have suffered from many epidemics caused by a different pathogen such as the black plague, cholera, yellow fever, smallpox, SARS, Middle East respiratory syndrome, Spanish flu, Ebola, and others. A common feature of these epidemic diseases is that they can easily become pandemics, have high mortality rates, and are also caused by zoonotic pathogens transmitted by animals to humans (Koçoğlu & Tekdal, 2020).

Viral diseases are considered to be very serious issues that affect public health and human mental health. In 2002, some viral epidemics appeared, such as the severe acute respiratory syndrome coronavirus (SARS-CoV), H1N1 influenza in 2009, and the Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 (Elmer, Mepham, & Stadfeld, 2020). On December 31, 2019, specifically in Hubei province in the Chinese city of Wuhan, cases of acute respiratory infections were reported through the Chinese Center for Disease Control and Prevention. The cause of the outbreak was a new virus belonging to the coronavirus strain (Ebrahim & Memish, 2020). In light of the emergence of this virus and its spread in various provinces of China, the World Health Organization announced on the eleventh of February that the new virus (COVID-19), which is an abbreviation for “coronavirus disease 2019,” is the cause of the respiratory disease (Alzwin, Bashatwa, & Hamadne, 2021). With the number of infections doubling in China and most countries of the world, the World Health Organization classified the COVID-2019 virus as a pandemic on March 11, 2020. The infection cases reached more than 700 thousand infections and more than 35 thousand deaths (Chen, Liu & Guo, 2020).

Based on the aforementioned, the governments of the countries of the world declared a state of emergency to limit the spread of the emerging coronavirus (COVID-19). The Kingdom of Saudi Arabia was one of the first countries in the Middle East to take strict measures to prevent this emerging virus (Barry, Al Amri, & Memish, 2020). They included taking safety measures such as social distancing, and wearing masks in government and private institutions, departments, and shops to reduce the number of infected people (Mahnashi, et al, 2021).

The spread of this virus led to efforts by researchers, specialists, and international companies in the field of epidemiology, diseases, and biotechnology to expedite the attempt to reveal the composition of the genetic material of the virus to find an effective vaccine that eliminates this virus to save human lives (Rawia & Hafsia, 2021). Accordingly, vaccines for the coronavirus appeared that meet the standards of effectiveness and safety from the leading global companies in the vaccine industry such as the Sputnik V vaccine. It was the first registered vaccine in the world based on the human adenovirus platform. Its effectiveness was proven by 91.4% in the final test point of clinical studies and research, while its effectiveness against critical cases of HIV infection reached 100%. The vaccine was developed at the Russian Gamalia Research Center for Epidemiology and Microbiology and the Ministry of Health of the Russian Federation (Unified National Platform, 2021). There are several vaccines against COVID-19 that have been approved by the World Health Organization for use (based on the Emergency

Use Authorization Protocol). The mass vaccination program started in early December 2020, and the number of vaccination doses given is being updated on the COVID-19 dashboard. As of November 26, 2021, the following vaccines had been authorized for emergency use: Pfizer/BioNTech Comirnaty on December 31, 2020, SII/COVISHIELD and AstraZeneca/AZD 1222 on February 16, 2021, Janssen / Ad26. COV2.S developed by Johnson & Johnson on March 12, 2021, Moderna COVID-19 vaccine (mRNA 1273) on April 30, 2021, Sinopharm COVID-19 vaccine on May 7, 2021, Sinovac-CoronaVac against COVID-19 on June 1, 2021, and COVAXIN BBV152 for Bharat Biotech on November 3, 2021 (WHO, 2022).

Therefore, countries have begun to provide these vaccines to people as immunization was one of the most important measures in this pandemic. Immunization is considered a simple, safe, and effective way to protect against diseases because it pushes the body to resist a specific infection and strengthens the immune system by training the immune system to produce antibodies. Given the rapid and easy spread of the coronavirus (COVID-19) and its infection with the majority of the world's population, the importance of this vaccine lies in protecting against the coronavirus by allowing the body to safely develop an immune response that protects the body by preventing or controlling the infection. The vaccine also allows the lifting of bans in countries, easing social distancing, and thus gradually returning normal life to its previous state before the pandemic (Al-Shaiji, 2021). Vaccines reduce the risk of disease by working with the body's natural defense to protect. When the vaccine is taken, the immune system responds so that it recognizes the virus as soon as it enters the body, produces antibodies (proteins that the immune system naturally produces to fight disease), and the body remembers the disease and how to fight it. Therefore, the vaccine is a safe and smart way. Once the body takes one or more doses of the vaccine, it produces an immune response without causing disease. Rather than treating the disease after it occurs, the vaccine (COVID-19) will prevent the disease in the first place. Vaccines aim to provide immunity against COVID-19 in general. They contain weakened or inactive parts of a particular organism that trigger an immune response within the body. This weakened version will not cause disease to the person receiving the vaccine, but it will require their immune system to respond. Some vaccines require multiple doses within weeks or months. This is sometimes required to allow long-lived antibody production and memory cell development. In this way, the body is trained to fight the specific disease-causing organism and build a memory against it so that it can fight it in the future (Der li, et al, 2020).

Countries rushed to give their people the vaccine, and one of the most important factors behind the use of these vaccines was to preserve the human soul in light of the difficult conditions in which nearly four million people died and 200 million were infected. Preserving the human soul is one of the priorities of humans to prevent more such deaths and injuries (Al-Shaiji, 2021). The Kingdom of Saudi Arabia has rushed to provide the coronavirus vaccine that meets the standards of effectiveness and safety from the leading global companies in the vaccine industry through COVAX Facility. The Food and Drug Authority announced its approval to register the "Pfizer-Biontech" vaccine for the coronavirus in the Kingdom, in addition to the AstraZeneca and Moderna vaccines. Through the "My Health"

application, it provided the opportunity to take the vaccine for all citizens and residents without coercion. It was also keen to answer questions related to the topic, importance, and effectiveness of the vaccine. The Ministry of Health issued a guide that includes answering all questions related to the corona vaccine. It was published through the Ministry's account on (Twitter) and its awareness platform, "Live Healthy," which includes several topics, most notably: the types of vaccines available in the Kingdom of Saudi Arabia, the categories that can take the vaccine, and advice before and after taking the vaccine, side effects and dealing with them, and contraindications to vaccination. These vaccines are considered safe because they have passed the testing stages effectively and produce a strong immune response and persistent antibodies. The side effects are usually minor and temporary (such as infection at the injection site or pain and redness at the vaccination site, vomiting, diarrhea, allergy, body tremors, and headache (National Unified Platform, 2021).

With the desire to receive or abstain from the vaccine, the study of people's taking or hesitation to get vaccines began, and different models were discovered trying to find out the differences in people's health behavior. Among the most promising models in this regard is one that takes into account the following psychological factors. Trust is the person's confidence in the efficacy and safety of vaccines, the health services they provide, and the policymakers who decide to introduce them. Conviction is whether or not a person considers the disease to be extremely dangerous to his health. Credit is the individual's participation in the comprehensive search for information that makes him weigh the risks and benefits of getting the vaccine. Restrictions (or convenience) are how easy it is for the person concerned to have access to the vaccine. Collective responsibility is the desire to protect others from infection through personal vaccination (David Robson, 2021).

Some intellectual biases interfere with fear and resistance to vaccines such as bias to the first information like rumors that appeared at the beginning of the outbreak of the emerging coronavirus that this virus is a global conspiracy and made in the laboratory. The subconscious mind retains this information and remains biased towards it, constantly looking for confirmation "confirmation bias". People who refuse the vaccine are more likely to obtain information about the emerging COVID-19 from traditional and unreliable sources and had high levels of mistrust of vaccines (Ashraf, 2021).

From the foregoing, the importance of the current study lies in terms of studying the psychological factors behind taking the coronavirus (COVID-19) vaccine and the symptoms accompanying it for a sample of people who received the vaccine. This study is one of the pioneering studies in the Kingdom of Saudi Arabia that is concerned with studying the effect of psychological factors and symptoms on receiving COVID-19 vaccines.

Statement of problem

The year 2020 is considered the year of the "COVID-19" pandemic par excellence. The world prepared with optimism to receive the year 2021 and considered it the year of the vaccine against the COVID-19 pandemic. The world began preparing to

receive the vaccine stage with the announcement of the readiness of more than one different vaccine for distribution around the world. But with this state of optimism, there is a state of panic, anxiety, and fear regarding the vaccine, which generated a set of opinions among people being supporters or opponents to take the vaccine, and neutrals as a result of their desire to go deeper and research more about these vaccines and their effects on humans. A large number of people are still reluctant to get vaccinated, and it has turned into something like a culture war on social media. Several online commentators have described the reluctant to get the vaccine as simply ignorant or selfish, but psychologists who specialize in medical decision-making say these choices are often the result of many complex factors that must be addressed sensitively if we are to have any hope of reaching a vaccine to immunity at the population level. The Kingdom of Saudi Arabia announced through the Ministry of Health in November 2021 that it had reached 70% of immunization with two doses of the anti-Coronavirus vaccine. Therefore, there was a need to conduct this study, which aimed to examine the psychological factors behind taking the COVID-19 vaccine and the symptoms accompanying it for a sample of people who received the vaccine. Specifically, this study attempted to answer the following questions:

- What are the psychological factors behind taking the COVID-19 vaccine for a sample of people who received the vaccine in the Saudi community?
- What are the symptoms associated with taking the coronavirus COVID-19 vaccine for a sample of people who received the vaccine in the Kingdom of Saudi Arabia?

Significance of the study

The significance of this study is evident through its focus on an important issue of health and healthy human behavior, which is the psychological factors behind taking the coronavirus (COVID-19) vaccine and the symptoms accompanying it for a sample of people who received the vaccine. Also, it is significant in enriching the global and humanitarian library with the literature of the theoretical study and its results. It is hoped that the Ministry of Health, the Health Department, the vaccination centers in various regions of the Kingdom of Saudi Arabia, and health practitioners will benefit from the information provided by the current study about the psychological factors behind taking the coronavirus vaccine (COVID- 19) and the associated symptoms for a sample of people who received the vaccine, which may be useful in improving attitudes and policies towards receiving the vaccine. In addition, officials in the Ministry of Health may benefit from the results of the current study to make appropriate medical decisions to deal with many complex psychological factors that must be treated sensitively to reach population-wide immunity.

Methodology

In this study, the descriptive approach was used following the survey method because it is the most appropriate for the nature of this study. I was conducted by distributing the study instrument (questionnaire) to the study sample to answer the research questions and achieve the objectives of the study.

Sample of the study

A sample of (520) people from the Saudi community who received the COVID-19 vaccine (three doses) in the city of Najran, Saudi Arabia for the year 2022 were selected. Their ages ranged between (20-50), and they were chosen following the convenience sampling method from various spectrums of society (students, employees). Due to their agreement to participate in the study, the paper questionnaire was converted to an electronic questionnaire using (Google Forms), and then the link was distributed to the sample using social media (WhatsApp) and e-mail.

Instrument of the study

A questionnaire was built based on theoretical literature and previous studies that examined health topics and issues, healthy human behavior, and psychological factors behind taking the COVID-19 vaccine and associated symptoms. The scale consists of three sections, the first section relates to the demographic data of the sample in terms of gender and age. The second part relates to the psychological factors behind taking the COVID-19 vaccine, which are (5) factors: Trust that measures the person's confidence in the effectiveness and safety of vaccines and the health services they provide. Conviction measures the person's conviction that the Covid-19 virus is extremely dangerous to his health. Credit is the individual's participation in the comprehensive search for information that makes him weigh the risks and benefits of getting a vaccine. Restrictions: how easily a person can access the vaccine. Collective responsibility indicates the desire to protect others from infection through personal vaccination. The third part relates to the symptoms associated with taking the coronavirus vaccine: pain at the vaccination site, swelling at the vaccination site, redness at the vaccination site, high temperature, body pain and fatigue, vomiting and diarrhea, body tremors, and headach. Binary scale (yes, no) and scores (1, 0) were given respectively to calculate the examinees' scores.

Validity and reliability of the instrument

The validity of the content of the study instrument was verified in its initial version by ten experts specialized in mental health and health behavior from faculty members in Saudi universities to ensure the appropriateness of the scale to achieve the study's objectives. The reliability of the scale was also verified by calculating the internal consistency coefficient according to the "Cronbach's alpha" equation. The scale was administered to an exploratory sample selected from outside the study sample and consisted of (40) individuals. The reliability coefficient of the instrument was calculated, and the total coefficient reached (0.81). Thus, this instrument was considered suitable for achieving the objectives of the study.

Procedures of the study

The statement of the problem and its elements were identified. The study population was determined, then the theoretical literature and previous studies related to the subject of the study were reviewed, analyzed and items were

extracted from them that could serve as an instrument for the study (the questionnaire), and then the study instrument in its initial version was prepared. Then, validity and reliability were verified, and approvals from the official authorities to facilitate the researchers' task to apply the study instrument were obtained, and then the sample was selected following the convenience method from Najran region, the Kingdom of Saudi Arabia after converting the paper questionnaire to an electronic questionnaire using (Google Forms). After that, the link was distributed to the sample using social media, namely, WhatsApp, then the data was collected and made sure of its completeness, and corrected. Then, the data were analyzed using the Statistical Package (SPSS) program, and the results were extracted, discussed, and interpreted. Finally, recommendations were written.

Results

The first research question: What are the psychological factors behind taking the COVID-19 vaccine for a sample of people who received the vaccine in the Saudi community?

To answer this question, frequencies, ratios, and the "chi-squared" test were extracted to show the differences between the distribution of the observed and expected values of the study sample's responses about the psychological factors behind taking the COVID-19 vaccine among a sample of people who received the vaccine in the Saudi community as shown in Table (1).

Table 1
Frequencies, percentages, and the "chi-squared" test were extracted to show the differences between the distribution of the observed and expected values of the study sample's responses about the psychological factors behind taking the COVID-19 vaccine among a sample of people who received the vaccine in the Saudi community

No.	Psychological factors	Yes		No		Expected value	Chi-value	df	Sig-tailed-2
		Frequencies	%	Frequencies	%				
1	Trust	546	86.7	84	13.3	315	338.8	1	.000
2	Conviction	532	84.4	98	15.6	315	298.978	1	.000
3	Credit	513	81.4	117	18.6	315	248.914	1	.000
4	Restrictions	564	89.5	66	10.5	315	393.657	1	.000
5	Collective responsibility	567	90.0	63	10.0	315	403.2	1	.000

Table 1 shows that there were statistically significant differences at (0.05) between the distribution of the observed and expected values for the study sample's responses about the psychological factors behind taking the coronavirus COVID-19 vaccine among a sample of people who received the vaccine in the Saudi society and in favor of the observed values (Yes). This indicates that these are the psychological factors behind taking the vaccine. Looking at the frequencies and ratios, it is seen that the most important psychological factors according to the rank are as follows: collective responsibility, restrictions, trust, conviction, and credit.

The second research question: What are the symptoms associated with taking the coronavirus COVID-19 vaccine for a sample of people who received the vaccine in the Kingdom of Saudi Arabia?

To answer this question, the frequencies and ratios of symptoms associated with taking the COVID-19 coronavirus vaccine were extracted for a sample of people who received the vaccine in the Kingdom of Saudi Arabia according to the first, second, and third doses as displayed in Table 2.

Table 2
Frequencies and ratios of symptoms associated with taking the COVID-19 coronavirus vaccine for a sample of people who received the vaccine in the Kingdom of Saudi Arabia according to the first, second, and third doses

No.	Symptoms	First dose				Second dose				Third dose			
		Yes		No		Yes		No		Yes		No	
		Frequencies	Ratios	Frequencies	Ratios	Frequencies	Ratios	Frequencies	Ratios	Frequencies	Ratios	Frequencies	Ratios
1	Pain at the vaccination site	553	87.8	77	12.2	540	85.7	90	14.3	517	82.1	113	17.9
2	Swelling at the vaccination site	534	84.8	96	15.2	511	81.1	119	18.9	455	72.2	175	27.8
3	Redness at the vaccination site	519	82.4	111	17.6	503	79.8	127	20.2	402	63.8	228	36.2
4	High fever	549	87.1	81	12.9	518	82.2	112	17.8	398	63.2	232	36.8
5	Body pain & fatigue	544	86.3	86	13.7	541	85.9	89	14.1	511	81.1	119	18.9
6	Vomiting & diarrhea	36	5.7	594	94.3	35	5.6	595	94.4	35	5.6	595	94.4
7	body tremors	29	4.6	601	95.4	28	4.4	602	95.6	21	3.3	609	96.7
8	headach	32	5.1	598	94.9	29	4.6	601	95.4	22	3.5	608	96.5

Table 2 shows the most symptoms in the first dose respectively: pain at the vaccination site, high fever, body pain and fatigue, swelling at the vaccination site, and redness at the vaccination site. The ratios between individuals ranged between (82.4-87.8%), which is thus a common occurrence. The rest of the symptoms such as vomiting, diarrhea, body tremors, and allergy had low ratios and rare occurrences. In the second dose, the most important symptoms were body pain and fatigue, pain at the vaccination site, high fever, swelling at the vaccination site, redness at the vaccination site. The percentages of symptoms ranged between (79.8 - 85.9%). The rest of the symptoms such as vomiting, diarrhea, body tremors, and allergy scored low and rare. In the third dose, the most important symptoms were pain at the vaccination site, pain in the body and fatigue, swelling at the vaccination site, redness at the vaccination site, high fever. The percentages of symptoms ranged between (63.2 - 82.1%). The rest of the symptoms like vomiting and diarrhea, body tremors, headach) had low ratios and rare occurrences.

Discussion

The first research question: The results showed statistically significant differences between the distribution of the observed and expected values of the study sample's responses about the psychological factors behind taking the coronavirus (COVID-19) vaccine among a sample of people who received the vaccine in the Saudi society and in favor of the observed values (Yes). The most important psychological factors were the collective responsibility (the desire to protect others from infection with the coronavirus "COVID -19" through personal vaccination). This is because of the personal responsibility that stems from the Muslim's personality, who believes that it is important to prevent harm from others. Therefore, the vaccine is one of the most important means to preserve the human soul in light of the difficult circumstances caused by the coronavirus pandemic and the death of many people as a result of infection with this virus. Then, the restrictions followed. They are related to the ease of access of the concerned person to the vaccine (Coronavirus COVID-19). This result is due to the Kingdom of Saudi Arabia through the Ministry of Health to quickly provide the coronavirus vaccine that meets the standards of effectiveness and safety from the leading global companies in the vaccine industry through COVAX International Facility. Through Sehaty application, the Kingdom has provided the opportunity to have the vaccine for all citizens and residents without coercion through hospitals and health centers accredited with high quality and the availability of highly qualified health practitioners. After that, came the psychological factor "trust", which is related to a person's confidence in the effectiveness and safety of vaccines and the health services they provide. This result is attributed to the efforts of the Ministry of Health, which issued a guide that includes answering all questions related to the Corona vaccine, which was published through the ministry's account on (Twitter) and its awareness platform 'Live healthy.' The guide contains several topics, most notably: the types of vaccines available in the Kingdom, the categories that can take the vaccine, advice before and after taking the vaccine, side effects and how to deal with them, contraindications to vaccination with the vaccine, and other topics related to the Corona vaccine. This contributed to increasing trust in vaccines available and their impact on the protection of the human soul. Then, the psychological factor, "conviction" followed. This factor is related to whether the person considers the coronavirus (COVID-19), itself extremely dangerous to his health or not. This result is because all the study samples received the three doses, and this confirms their conviction of the severity of this virus. So, they turned to take the vaccine to protect themselves and others, so that they could go about their lives normally without any restrictions. Finally, the psychological factor "credit" associated with the individual's participation in the comprehensive search for information that makes him balance the risks and benefits of obtaining the vaccine came in the last place and the lowest percentage. Perhaps, this is due to the difficulty most of the time to access accurate information about vaccines, especially in light of what was published of rumors about vaccinations on social media.

The second research question: The results showed that the most symptoms in the first, second, and third doses, respectively: pain at the vaccination site, high temperature, body pain and fatigue, swelling at the vaccination site, and redness at the vaccination site. These symptoms were the most important and common.

This is attributed to the fact that vaccines are made to provide immunity to the person without being exposed to the risk of disease, and it is common for some side effects ranging from mild to moderate to occur when taking the vaccine. Also, this is because the immune system instructs the body to react in certain ways to increase the blood flow to enable more immune cells to circulate and raise the body's temperature to kill the virus. The occurrence of side effects such as a mild fever or body muscle pain and fatigue is normal and not a cause for concern. They are signs that the body's immune system is responding to the vaccine, specifically the antigen (the substance that activates the immune response), and is preparing to confront the virus. These side effects usually go away on their own after a few days. Common side effects are good because they are indicative that the vaccine is working.

The results also showed that symptoms such as vomiting, diarrhea, body tremors, and headache came in low and rare rates. Perhaps, the appearance of such symptoms may be related to some extent in some people who suffer from an allergy to vaccines or have some chronic diseases, or fear of taking the needle would cause fear and panic, or it may be related to people eating types of food. However, such symptoms were recorded at low rates, it is important for the individual to inform health practitioners about such symptoms, and that the individual should monitor himself.

Recommendations

The findings of the study contribute to suggesting recommendations that allow health officials in the Kingdom of Saudi Arabia to understand the psychological factors that contribute to taking the Coronavirus (COVID-19 vaccine) and the symptoms associated with it to help them take appropriate measures and policies to support and encourage members of the Saudi society to take these vaccines to save the human soul. Also, the results of this study constitute a knowledge base that helps plan awareness programs aiming at educating the Saudi and Arab community on receiving vaccines for the Coronavirus (COVID-19) and the appropriate ways to deal with the community to receive vaccines to address this virus, especially in light of the demand for giving the third booster dose to prevent this disease.

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