

Measuring the Factors of Hesitancy in Saudi Population toward COVID-19 Vaccines

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Abstract

COVID-19 has major effects on the population, enforcing lockdowns and strict precautions across the world to deter the virus from spreading. The pandemic presents a significant threat to our health and well-being. As vaccines become available, COVID-19 lethality may be reduced by promoting widespread immunization. To achieve herd immunity thresholds for COVID-19, an estimated 70% of the population must be vaccinated. The public's approval determines the success of the vaccination program. Understanding the factors that contribute to COVID-19 vaccine hesitancy is important. Therefore, this cross-sectional study was conducted on the Saudi population from all the regions of the Kingdom of Saudi Arabia to evaluate the level of knowledge about COVID-19 vaccines, estimate the turnout level for receiving the COVID-19 vaccine, and understand the reasons behind hesitancy toward COVID-19 vaccines. A total of 1,148 adults completed a web-based questionnaire, and the study tested several sociocultural and environmental variables that affect the community's hesitancy toward vaccination. Results showed that gender characteristics had almost no effect on acceptance of the vaccination. Individuals of the younger age group < 30 demonstrated an increase in the rate of vaccine hesitancy (53%) compared with individuals from the older age groups > 40 (34.43%).

In addition, middle and higher education groups were found to have significant vaccine hesitancy (77.4%) compared with the less educated group (41.1%). The most common concern among the non-vaccine takers in this questionnaire was that of vaccine safety: these participants believed the vaccine would result in health problems (49.3%), and most participants agreed (64%) that this was due to the insufficient duration of vaccine administration for safety evaluation.

Keywords: COVID-19; Hesitancy; Acceptance; Saudi Arabia; Vaccine

1. Introduction

In late December 2019, a serious acute respiratory disease outbreak, attributed to a new strain of coronavirus (COVID-19), occurred in Wuhan, China (Poland, 2020). The illness spectrum of COVID-19 is broad, ranging from asymptomatic infection to acute respiratory distress syndrome, resulting in death ("NIH, COVID-19 Treatment Guidelines", 2021). In response to the pandemic, dozens of vaccine research efforts have been launched (Kaur & Gupta, 2020).

The COVID-19 pandemic has had a major effect on populations, with governments across the world enforcing travel limits and other interventions such as obligatory face coverings or quarantine to deter the virus from spreading (Sherman *et al.*, 2020). The world is facing a novel infectious illness as a result of the COVID-19 pandemic, which presents a significant threat to our health and well-being ("WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020", 2021). COVID-19's lethality should promote widespread immunization as a vaccine becomes available. Unfortunately, recent public polling data in the United States reported otherwise, with 20–27% of the public claiming that they would refuse to be vaccinated against the infection ("Most Americans expect a COVID-19 vaccine within a year; 72% say they would get vaccinated", 2021).

Moderna and Pfizer-BioNTech reported their results from randomized trials of COVID-19 vaccines in November 2020, revealing an impressive 90–95% efficacy (Polack *et al.*, 2020). On December 10, 2020, the Food and Drug Administration (FDA) released Emergency Use Authorizations (EUA) for the Pfizer-BioNTech vaccine, and on December 18, 2020, for the Moderna vaccine ("Coronavirus (COVID-19) Update: FDA Holds Advisory Committee Meeting to Discuss Authorization of COVID-19 Vaccine Candidate as Part of Agency's Review of Safety

and Effectiveness Data", 202; "FDA Takes Additional Action in Fight Against COVID-19 By Issuing Emergency Use Authorization for Second COVID-19 Vaccine", 2021). To achieve herd immunity thresholds for COVID-19, an estimated 70% of the population must be vaccinated (Fine *et al.*, 2011; Kwok *et al.*, 2020; Weinberg & Szilagy, 2010). The vaccination program's success will be determined by the public's approval of the vaccines. Understanding the causes that contribute to COVID-19 vaccine hesitancy is important. To dispel people's skepticism about such vaccinations, strong public health programs must be created and continued. Effective public communication necessitates formative research into the awareness gaps, expectations, values, health behaviors, and demographic characteristics that contribute to anticipated COVID-19 vaccine hesitancy (Ruiz & Bell, 2021).

The effective production and universal acceptance of a SARS-CoV-2 vaccine would be a significant step in combating the pandemic, but achieving high uptake will be difficult, exacerbated by online disinformation (Loomba *et al.*, 2021). Conventional and social media play a role in the production of COVID-19 vaccine hesitancy. Understanding that people are suspicious of a COVID-19 vaccine is critical because this will help health officials increase vaccine awareness and thereby reduce disease transmission. It is estimated that to achieve herd immunity, a novel COVID-19 vaccine must be accepted by at least 55% of the population (Kwok *et al.*, 2020; Sanche *et al.*, 2020).

If large-scale vaccine rejection threatens herd immunity goals, large-scale acceptance of local vaccine rejection may also have significant consequences for community (herd) immunity because clustering of non-vaccinators can disproportionately increase the required percentage of vaccination coverage to achieve herd immunity in adjacent geographical regions and encourage epidemic spread (Salathé & Bonhoeffer, 2008). While studies have been conducted to investigate the impact of misinformation about COVID-19 on public perceptions of the pandemic (Geldsetzer, 2020; Islam *et al.*, 2020; Kim *et al.*, 2020) and the proclivity of some socio-political groups to believe misinformation (Kreps & Kriner, 2020; Murphy *et al.*, 2021), experts still lack a quantitative understanding of the relationship between exposure to misinformation about COVID-19 and intent to receive the vaccination.

If a viable vaccine becomes available, it is critical to consider this relationship, how it affects various sociodemographic groups, and whether groups at high risk of experiencing serious COVID-19 complications are vulnerable to misinformation (Loomba *et al.*, 2021).

Several studies on the decision to obtain the vaccine were conducted during the vaccine production phase. Moreover, various studies have revealed many factors that influence vaccine acceptability when a new vaccine is launched (Gidengil *et al.*, 2012; Larson *et al.*, 2018; Setbon & Raude, 2010; Xiao & Wong, 2020). These factors include the vaccine's safety and potency, adverse health effects, misconceptions regarding the need for vaccination, a lack of confidence in the health system, and a lack of general awareness about vaccine-preventable diseases (Setbon & Raude, 2010; Halpin & Reid, 2019).

Vaccine hesitancy is an obstacle to the effectiveness of immunization programs and has been listed by the World Health Organization (WHO) as one of the top 10 global health challenges in 2019 ("Ten health issues WHO will tackle this year", 2021). A comprehensive understanding of current vaccine attitudes and potential determinants of people's behavior is essential for designing effective health communications to encourage uptake and implement successful demographic immunization. Vaccine hesitancy is a serious threat in the struggle against COVID-19 because achieving herd immunity is dependent on the efficacy of the vaccine and the community's willingness to accept it (Lazarus *et al.*, 2020). The multifaceted nature of vaccine hesitancy, including willingness to accept COVID-19 vaccines, can complicate studies into its global effects (MacDonald, 2015).

Despite significant attempts to develop effective COVID-19 vaccines, a major impediment may be attributed to vaccine hesitancy against accepted and prospective COVID-19 vaccination (Harrison & Wu, 2020). Many studies about whether or not to take the vaccine were conducted prior to the vaccine's availability. Statistics suggest that the vaccine's adoption is gradually increasing. A total of 1,448,242,899 vaccine doses had been delivered as of May 20, 2021. According to UN data, the 2020 population in Saudi Arabia is expected to be 34,813,871 people at the mid-year point, yet just 15,099,896 vaccine doses have been administered ("WHO Coronavirus Disease (COVID-19) Dashboard", 2020).

This cross-sectional study was conducted among the Saudi population to assess the level of knowledge about the COVID-19 vaccine,

Estimate the level of participation in the COVID-19 vaccine, and understand the reasons for hesitancy and fear about the COVID-19 vaccines to determine the scope of the problem.

2. Material and Methods

The study design was cross-sectional, and we used the Google Docs platform to design and disseminate a questionnaire online through social media applications (Twitter and WhatsApp) to achieve snowball sampling with participants from all over the country. We distributed the questionnaire and collected responses within only three days to avoid bias that may occur because beliefs and behaviors change over time.

2.1. Sample Size

The population of the Kingdom of Saudi Arabia is around 35,013,414 million, according to the latest population census in 2020 ("Reports and statistics", 2021). Moreover, according to the Assistant Deputy Minister for Preventive Health, Dr Abdullah Assiri, the ministry plans to vaccinate 26 million people (88% of the population) by the end of 2021 (Assiri, 2021). We entered these numbers into Epi Info 7 software and estimated a sample size of 969 participants at 80% power and 99.99% confidence interval. However, we collected 1,148 responses to be able to exclude incomplete questionnaires.

2.2. Study Tool

The questionnaire was designed after reviewing similar studies that had been conducted in other countries. The authors of the current paper held an online meeting to discuss these studies and choose the most relevant questions, which were customized for the context of the local culture. After agreeing on the questionnaire, a well-constructed online questionnaire was disseminated using the Google Docs platform. The questionnaire consisted of two parts: one to gather sociodemographic data, and another to assess criteria such as age, education, and work in relation to the level of awareness about the COVID-19 vaccine.

2.3. Ethical Considerations

The study was ethically approved by the ethics committee of Jeddah Health Affairs before starting data collection. In the first part of the questionnaire, we identified ourselves and stated the participants' rights. At the end of the questionnaire, we informed participants that an email address would be provided should participants have any inquiries regarding unclear questions or should they wish to withdraw from participation. Additionally, participants were informed that no names would be recorded on the questionnaires and that all personal information about participants would be kept confidential.

3. Results

According to the study design, 1,148 adult individuals from all regions in the Kingdom of Saudi Arabia responded to the electronic questionnaire describing their experiences with the COVID-19 vaccine. The results section comprises two main sections: the first describes the characteristics of the participants and their experience regarding the vaccine; the second presents the factors potentially associated with disagreement about receiving the vaccine.

3.1. Characteristics of the Study Group and Their Experience of the COVID-19 Vaccine

There was a slight dominance of females (59.3%) over males (40.7%), and the vast majority were Saudis (92.2%). The mean age of the participants accounted for 36.9 ± 8.7 years, about one-third (34.2%) being 30–39 years and slightly more than one-third (37.9%) being 40 years or older. Most of the participants possessed either a bachelor's qualification (56.6%) or a postgraduate degree (28.8%). Only one-third of the participants (34.4%) were either jobless or still students, and the remainder had jobs mainly in the health sector (20.6%) and the education sector (Table 1).

The majority of the participants (70.2%) reported that they had been tested for COVID-19 before, and 12.1% had tested positive for COVID-19. Most of the positive cases (86.3%) were advised to isolate themselves at their homes, while 13.7% were referred to quarantine isolation (Table 2).

When asked to rate the seriousness of the COVID-19 disease, less than one-half of participants (46.1%) regarded it as a very serious disease, 44.7% stated that it is not a serious disease, while 6.9% claimed that it is not serious at all (Figure 1).

Table 2 shows that most of the participants (72.7%) thought that the COVID-19 vaccine is important, and 68.0% had received it. Among those who had received the vaccine, besides believing that the vaccine is important, fear of catching the disease (38.7%) and benefits from the merits of being vaccinated (36.5%) were the main impetus for seeking vaccination. The Pfizer vaccine was the most commonly received (63.9%), while AstraZeneca was given to 34.8%, which is nearly in line with participants' preferences for type of vaccine, with 62.1% preferring the Pfizer vaccine. The reasons for preferences for certain types of vaccine ranged between scientific issues (64.6%), social effects (31.8%), and media effects (53.4%). The overwhelming majority of those who had received the vaccine (87.1%) stressed that they would advise others to take it.

3.2. Vaccine Non-takers and Factors Potentially Associated with Disagreeing to Take the Vaccine.

Only one-quarter of those who did not receive the vaccine (26.4%) thought that the vaccine is safe, and one-half (50.4%) claimed that they had no idea about the safety of the vaccine. The main reason for not taking the vaccine was fear of side effects (42.5%), and the main sources for information about the vaccine were media web pages (32.2%), international media (27.8%), and social media (19.6%). One-half of the vaccine non-takers believed that the vaccine would be harmful (49.3%). They attributed their belief to the insufficient duration of vaccine testing (64%) and scarce information about it (51.2%), while 14.2% believed that there is a conspiracy behind the administration of the vaccine (Table 4). Figure 2 demonstrates that 42% of vaccine non-takers would agree to receive it, while 58% would refuse it. The following section describes factors potentially associated with disagreeing to take the vaccine.

Table 5 demonstrates that the younger the age, the more likely the agreement to take the vaccine; the percentage of those who agreed ranged from 53% among those aged < 30 years to 34.3% among those aged 40 years or older. Also, agreement was significantly higher in those with lower education levels (55.9%) compared with those with a bachelor qualification (38.9%) or a postgraduate degree (38.5%) ($p < 0.05$).

Although agreement was higher among males (46.9%), non-Saudis (52.4%), the jobless and students (46.9%), these differences are not statistically significant ($p > 0.05$).

Table 6 shows that those who believed COVID-19 is a serious disease were significantly more likely to agree to receive the vaccine (47.3%) than those who did not believe it is (18.9%) ($p < 0.05$). In addition, those who perceived that vaccination would return life to normal were significantly more likely to agree to receive the vaccine (64.1%) than were those who did not perceive this (14.8%) ($p < 0.05$). Conversely, those who perceived that the vaccine would be harmful were significantly less likely to agree to vaccination (19.3%) than those who thought that it is not harmful (68%) ($p < 0.05$).

Table 7 provides the backwards Wald regression model for factors predicting disagreeing to take the vaccine. The model shows that those who did not believe the vaccine would help return life to normal were nearly six times more likely to refuse to take the vaccine than those who believed it would return life to normal ($p < 0.005$). The second predictor for disagreement was participants' perception of the harmful effects of the vaccine, for which those who did not regard it as harmful were negatively associated with refusal to take the vaccine ($p < 0.05$).

Table 1: Sociodemographic characteristics of the study group (n = 1,148).

Characteristics	No.	Percentage
<i>Gender</i>		
Male	467	40.7
Female	681	59.3
<i>Nationality</i>		
Saudi	1,058	92.2
Non-Saudi	90	7.8
<i>Age categories</i>		
< 30 years	320	27.9
30–39 years	393	34.2
≥ 40 years	435	37.9
<i>Education level</i>		
Lower than secondary	12	1.0
Secondary	155	13.5
Bachelor	650	56.6

Postgraduate	331	28.8
<i>Job/field</i>		
Jobless/student	395	34.4
Has a job	753	65.6
Health sector	237	20.6
Education sector	163	14.2
Military field	30	2.6
Administrative field	157	13.7
Engineering field	54	4.7
Other fields	112	9.8

Table 2: Previous testing and exposure to COVID-19 (n = 1,148).

Testing and exposure to COVID-19	No.	Percentage
<i>Previously tested for COVID-19</i>		
Yes	806	70.2
No	342	29.8
<i>Previously diagnosed with COVID-19</i>		
Yes	139	12.1
No	1,009	87.9
<i>Measures taken after being diagnosed with COVID-19 (n = 139)</i>		
Home isolation advised	120	86.3
Referred to quarantine isolation	19	13.7

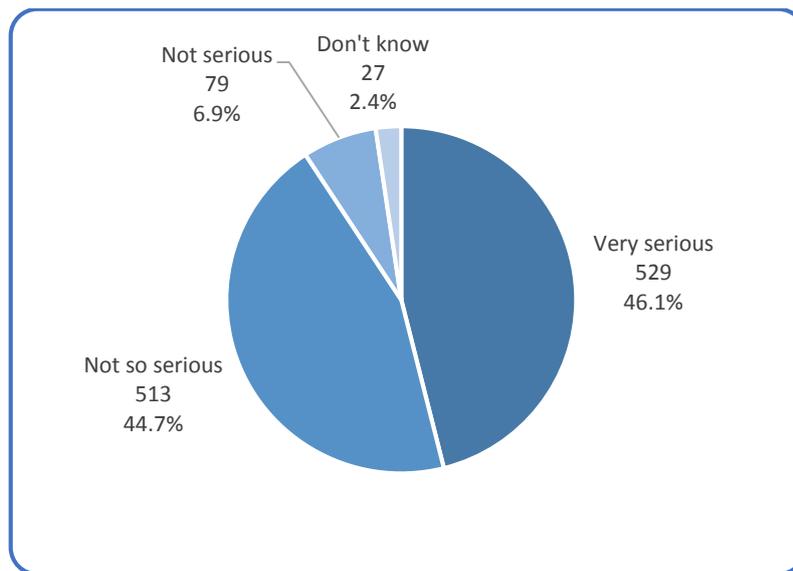


Figure 1: Rating of participants’ beliefs about seriousness of COVID-19.

Table 3: Participants’ experience of the COVID-19 vaccine.

	No.	Percentage
<i>Think that COVID-19 vaccine is important</i>		
Yes	835	72.7
No	139	12.1
Don't know	174	15.2
<i>Received the vaccine</i>		
Yes	781	68.0
No	367	32.0
<i>Impetus for seeking vaccine (n = 781)</i>		
Believe that the vaccine is important	510	65.3
Fear of catching the disease	303	38.7
Influence of family and friends	106	13.6
Obligated by employment	34	4.4
Received merits for being immunized	285	36.5
Other	74	9.5
<i>Type of received vaccine (n = 781)</i>		
Pfizer	499	63.9
AstraZeneca	272	34.8

Don't know	9	1.3
<i>Preference for certain vaccine (n = 781)</i>		
Yes, preferred Pfizer vaccine	485	62.1
Yes, preferred AstraZeneca vaccine	24	3.1
No	272	34.8
<i>Reasons for preferring certain vaccine (n = 509)</i>		
Scientific issues	329	64.6
Social effect	162	31.8
Media effect	272	53.4
<i>Would advise others to receive the vaccine (n = 781)</i>		
Yes	680	87.1
No	7	.9
Not sure	94	12.0

Table 4: Opinions and knowledge of vaccine skeptics regarding the COVID-19 vaccine (n = 367).

	No.	Percentage
<i>Think that the vaccine is safe</i>		
Yes	97	26.4
No	85	23.2
Don't know	185	50.4
<i>Reasons for not taking the vaccine</i>		
Suffer from health problems	38	10.4
There is no good reason to take it	91	24.8
Fear of side effects	156	42.5
Influence of friends	15	4.1
Influence of social media	54	14.7
No particular reason	110	30.0
<i>Sources of information about the vaccine</i>		
Local media	49	13.4
International media	102	27.8

Local news sites	25	6.8
Medical web pages	118	32.2
Social media	67	18.3
Family and friends	72	19.6
Others	207	56.4

Think that the vaccine could result in harmful health problems

Yes	181	49.3
No	50	13.6
Don't know	136	37.1

Reasons to think that vaccine could be harmful

The duration was not sufficient to test the vaccine well	235	64.0
There is not enough information about the vaccine	188	51.2
Believe that there is a conspiracy behind the vaccine	52	14.2

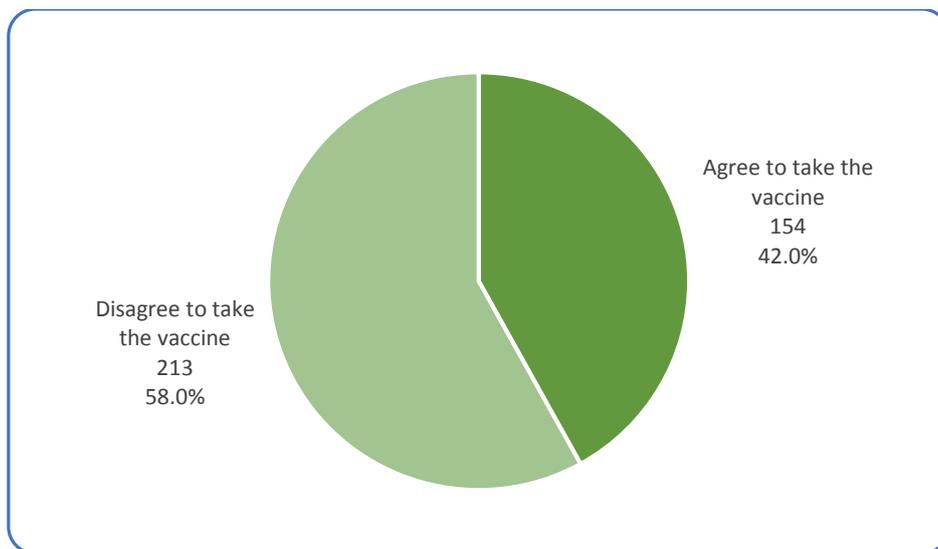


Figure 2: Agreement of the unvaccinated participants to take the vaccine.

Table 5: Agreement of the unvaccinated respondents to take the vaccine according to their characteristics (n = 367).

Variables	Agreement to take the vaccine				X ²	P*
	Agree		Disagree			
	No	%	No	%		
Gender						
Male	53	46.9%	60	53.1%	1.637	0.201
Female	101	39.8%	153	60.2%		
Nationality						
Saudi	132	40.6%	193	59.4%	2.114	0.146
Non-Saudi	22	52.4%	20	47.6%		
Age categories						
< 30 years	70	53.0%	62	47.0%	10.356	0.005
30 – < 40 years	48	36.9%	82	63.1%		
≥ 40 years	36	34.3%	69	65.7%		
Education level						
Secondary or lower	38	55.9%	30	44.1%	6.645	0.036
Bachelor	79	38.9%	124	61.1%		
Postgraduate	37	38.5%	59	61.5%		
Job						
Jobless/student	76	46.9%	86	53.1%	2.920	0.087
Has a job	78	38.0%	127	62.0%		

* Based on chi-square.

Table 6: Perceptions potentially associated with agreement to receive COVID-19 vaccine.

Variables	Agreement to take the vaccine				X ²	P*
	Agree		Disagree			
	No	%	No	%		
Think that COVID-19 is a serious disease						
Yes, very serious	62	47.3%	69	52.7%	14.354	0.002

Yes, not so serious	76	44.7%	94	55.3%		
Not serious	10	18.9%	43	81.1%		
Don't know	4	30.8%	9	69.2%		
Think that the vaccine could be harmful						
Yes	35	19.3%	146	80.7%		
No	34	68.0%	16	32.0%	72.491	< 0.001
Don't know	83	61.0%	53	39.0%		
Think that the vaccine could help return to normal life						
					66.598	< 0.001
Yes	98	64.1%	55	35.9%		
No	17	14.8%	98	85.2%		
Don't know	37	37.4%	62	62.6%		

* Based on chi-square.

Table 7: Factors predicting disagreement to take COVID-19 vaccine.

	B	S.E.	Wald	df	Sig.	Exp(B)
Returns life to normal						
Yes			32.738	2	.000	
No	1.793	.338	28.094	1	.000	6.007
Don't know	1.200	.312	14.751	1	.000	3.319
Think the vaccine is harmful						
Yes			41.425	2	.000	
No	1.604	.388	17.081	1	.000	.201
Don't know	1.751	.289	36.569	1	.000	.174
Constant	.048	.363	.017	1	.895	.953

Note. Factors excluded from the final model for non-significance: age, education level, seriousness of COVID-19 disease

4. Discussion

For decades, vaccines have proven effective in eradicating several deadly diseases, such as smallpox and measles (Al-Mohaithef & Padhi, 2020). In light of the emergence of the COVID-19 virus, which has claimed the lives of many, most of the world's eyes are directed toward the leading companies in the field of vaccines to produce a vaccine that saves people from the dreaded COVID-19 virus (Harrison & Wu, 2020). In contrast, a sizable number of people are unsure about the effects of the COVID-19 vaccination. Vaccine hesitancy has been a known phenomenon since the advent of the vaccine revolution, and it has had a significant impact on disease control (Benecke & DeYoung, 2019; Phadke *et al.*, 2016).

This study included 1,148 adults from all regions of the Kingdom of Saudi Arabia who completed a web-based questionnaire to share their experiences regarding the COVID-19 vaccine (Lazarus *et al.*, 2020). Several socio-cultural and environmental variables that affect a community's vaccination hesitancy were tested, such as gender, age, education, and media influence (Cordina *et al.*, 2021; Qunaibi *et al.*, 2021).

It is evident that gender characteristics had almost no effect on vaccination hesitancy, although the proportion of female respondents was relatively higher than male respondents.

This finding contradicts studies that have shown a higher tangible effect on vaccine hesitancy in women than in men (Fisher *et al.*, 2020; Khubchandani *et al.*, 2020). In contrast, men are less likely than women to engage in preventive behavior (Cordina *et al.*, 2021).

The age characteristic showed a clear increase in the rate of vaccine acceptance for individuals of the younger age group (< 30) by 53%, compared with 34.43% for individuals from the older age groups (> 40), and this finding differs from the results of Szilagyi, which states that the age group of fewer than 40 years appears to demonstrate significant hesitation towards the vaccine, while the age group over the age of 60 shows a desire to receive the vaccine (Loomba *et al.*, 202; Szilagyi *et al.*, 2021).

Interestingly, educational background had a negative effect on vaccine frequency, with 77.4% of those with middle or higher education expressing vaccine hesitancy, compared to 41.1% of those with lower education. These results are consistent with the results of the Loomba study conducted in the United Kingdom and the United States of America (Sherman *et al.*, 2020; Loomba *et al.*, 202).

Nonetheless, in a study conducted in Guyana, the results were contradictory: the educated group was the least hesitant about the COVID-19 vaccine, while the less educated group was not only hesitant to take the COVID 19 vaccine but also recommended others around them not to be vaccinated (UNICEF, 2021).

In our study, we analyzed the relationship between vaccination hesitancy and the use of social media and official websites to become informed about the pandemic. We discovered that 32.2% of the information came from media web pages, 27.8% from international media and 19.6% from social media. Some researchers believe that this difference may be due to several reasons, including, for example, the level of trust in science and scientists, easy access to publications related to negative outcomes of COVID-19 vaccines, or the influence of social media and local and international news, all of which have a clear effect on hesitancy toward COVID-19 vaccines (Cordina *et al.*, 2021; Biswas *et al.*, 2021).

In this context, vaccine type preference was evident when the Pfizer vaccine scored 63.9% versus AstraZeneca's 34.8%. Regardless of the scientific background of how these vaccines work, the administration of the AstraZeneca vaccine has received a blow because of the vaccine's potential side effects: namely, the development of thromboembolism, which has led to the death of a very few people who received the AstraZeneca vaccine. This was published by the local and international media, with a serious negative effect on the vaccine's uptake (Wise, 2021). Further, a number of European countries halted the AstraZeneca vaccine, which has led people in the Kingdom of Saudi Arabia to feel less skeptical of the Pfizer vaccine (Østergaard *et al.*, 2021).

5. Conclusion

In this study, we explored people's response at various ages, education levels, and genders to the COVID-19 vaccine. However, vaccine hesitancy cannot be presented in this study because it is not a qualitative or quantitative study; rather, it is a scoping study that provides us with a general orientation towards Saudi society's opinion of the COVID-19 vaccine.

6. Recommendations

The study clearly shows that vaccine hesitancy among older people is higher compared to younger people.

Based on this surprising result, we suggest that decision makers should work on broadcasting reassurance messages dedicated to the elderly about the importance of the vaccine and not having a negative effect on them. Moreover, people with higher education degrees tend to wait to accept the vaccine, waiting for more evidence about its effectiveness and the absence of side effects. Local and reliable media should allocate large space in their coverage to covering and translating COVID-19 Vaccine studies to provide more evidence that encourages educated people to make the decision to take the vaccine.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

This study was ethically finally approved by the Local Committee for Research Ethics in Jeddah health affairs on 15/6/2021 with the approval number: A01128.

Author's contributions

RA and AK conceptualized the study, drafted the questionnaire, conducted research, and collected and organized the data. RA wrote the initial and final draft of the introduction, accountable for all aspects of the work. AK wrote the initial and final draft of the abstract. BA reviewed the questionnaire and manuscript for submission and analyzed the collected data. AA was in charge of designing the questionnaire, as well as analyzing the collected data and writing the methodology, conclusions, and recommendations. TH was involved with the writing of the discussion, strengths, and limitations. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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