

# Beliefs, barriers, and acceptance associated with COVID-19 vaccination among Taif University students in Saudi Arabia

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## ABSTRACT

**Background:** COVID-19 was declared a public health emergency of global concern by the World Health Organization (WHO) on January 30, 2020. Vaccination is one of the most effective methods for halting the pandemic and preventing complications. Vaccine hesitancy is a possible threat to global public health. Understanding the key determinants that influence the community's preferences and demands for a future vaccine may aid in the development of strategies to improve the global vaccination program. The aim of this study was to assess the beliefs, barriers, and acceptance of COVID-19 vaccination among Taif University students in Saudi Arabia. **Materials and Method:** This was a descriptive cross-sectional study, based study in Taif University, Saudi Arabia. Data was collected using a designed self-administered questionnaire that was shared as a link through social media. 332 students were considered eligible to participate voluntarily. Data were analyzed using the (SPSS) program version 25. **Results:** Out of 332 participants, 278 (83.7%) were accepting to take the covid vaccine, while 54 (16.3%) refused. Beliefs in vaccine safety and effectiveness and trust in the ability of the vaccine to prevent the complication, were all associated with high acceptance rate. Fear about side effects is considered a major factor for vaccination refusal. **Conclusion:** Most of the participants have the willingness to be vaccinated. The majority of students who agreed to take the vaccine were in the medical field, and that is mostly due to their high knowledge exposure. This indicates the importance of raising the awareness of the non-medical students.

**Keywords:** COVID-19, medical education, acceptance, vaccine

## Introduction

In Wuhan city, Hubei Province, China, on December 31, 2019, a seafood shop was related to a group of pneumonia cases. Consequently, a novel etiological agent has been discovered and called severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), the cause of coronavirus disease 2019 (COVID-19).<sup>[1-3]</sup>

On January 30, 2020 World health organization (WHO) stated COVID-19 as an outbreak of a public health emergency of international concern.<sup>[4]</sup> Globally, the number of cases confirmed until February 28, 2021 were 113,467,303 COVID-19 cases, including 2,520,550 deaths reported by WHO.<sup>[5]</sup>

Many interferences are recommended by WHO that can reduce the rate of virus spread and help in flattening the epidemic curve such as quarantine and social distancing.<sup>[6]</sup> One of the best effective methods for stopping the pandemic and preventing the complications related to the infection

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is vaccination.<sup>[2,7]</sup> Although herd immunity should be established within the population to stop the COVID-19 pandemic, which is commonly obtained either by infection or vaccination. A lot of academic institutions and pharmaceutical companies put their effort to launch programs on vaccine origination versus SARS-CoV-2.<sup>[8]</sup> Even though public beliefs and perceptions toward vaccines and their acceptance play an important role.<sup>[8]</sup>

Several studies have shown different factors associated with vaccine acceptance when a novel vaccine becomes available.<sup>[9,10]</sup> These include the effectiveness and safety of the vaccine, suspicion in the health system, side effects of the vaccine, poor community information about vaccine-preventable diseases, and misconceptions about vaccine necessity.<sup>[11-13]</sup> During the current crisis, public health will be at threat if misinformation about vaccination and vaccine hesitancy still exists.<sup>[14]</sup>

Vaccine acceptance and hesitancy differ across the globe,<sup>[12]</sup> and up to date, only a few studies have looked to the public practice toward the COVID-19 vaccine and contributing factors.<sup>[15,16]</sup>

A study conducted among healthcare workers (HCWs) in China showed a high acceptance of COVID-19 vaccination compared with the general population.<sup>[16]</sup> Another research in the United States revealed that only 20% of HCWs plan to avoid vaccination with the new COVID-19 vaccine.<sup>[15]</sup> Additional study done among college students in South Carolina showed that the adoption of the COVID-19 vaccine among the students was affected by information resources.<sup>[17]</sup>

According to that, it is important to disseminate transparent and honest information on the safety and efficacy of vaccines to increase consumer trust, even hesitant and skeptical people.<sup>[18]</sup> Moreover, given the current public avoidance of influenza vaccine in Saudi Arabia, a COVID-19 vaccine is expected to face significant public hesitancy.<sup>[19]</sup>

In Saudi Arabia, during the period between January 3 to February 28, 2021, a total of 377,061 confirmed cases of COVID-19 have been reported with 6,488 deaths.<sup>[20]</sup> There are limited number of studies related to this public acceptance and knowledge about COVID-19 vaccine. One national web-based study was done to assess the prevalence of the acceptance of COVID-19 vaccine and their determinants. The study found that 64.7% of the participants were interested to accept the COVID-19 vaccine if it is available, where the willingness was higher among older age groups, married, with postgraduate educational level or higher, non-Saudi, and being employed in the government sector.<sup>[14]</sup>

This study aimed to assess the beliefs, barriers, and acceptance of COVID-19 vaccination among Taif University students in Saudi Arabia.

## Methods

**Study design and time frame:** A descriptive cross-sectional study was done from March 2021 to May 2021.

**Study settings:** An online survey was done at Taif University in Saudi Arabia.

**Study population:** A sample size of 332 students were the study participants, where the inclusion criteria were all students of Taif University, and the exclusion criteria were students who refused to participate or left unanswered questions.

**Tools and data collection procedure:** A predesigned questionnaire was used to collect data about students' sociodemographic data such as age, gender, nationality, marital status, specialty, education level, having any chronic diseases, anyone who has been diagnosed in their circle with coronavirus, and whether they received annual influenza vaccine or not. The second section assessed the diffusion of coronavirus information by asking whether their information about coronavirus was enough, whether information about corona virus was sufficient in Saudi society, trust in health system, and the source of their information. The third Section collected information on the students' beliefs toward COVID-19 vaccine (e.g., safe, effective, the best way to avoid complications of COVID-19, and public awareness is needed or not). And the fourth section assessed potential barriers that may prevent participants from being vaccinated such as fear of side effects, they do not believe that the vaccine will stop the infection, vaccine conspiracy, do not like the needles, they follow the preventive measures, or because they are young and healthy. In the fourth section, we also assessed under which scenarios participants would accept the vaccine (physician recommendation, mandatory by job, compulsory by the government, if family or friends got vaccinated, if more studies showed the safety of the vaccine, if there is a way other than needles, or would not take it in any situation).

**Ethical considerations:** An ethical approval for the study was obtained from the Research Ethics Committee (REC) of Taif university.

**Statistical analysis:** Data were analyzed using the Statistical Package for the Social Sciences (SPSS) program version 25. Qualitative data were expressed as numbers and percentages, and the Chi-squared test ( $\chi^2$ ) was used to assess the relationship between variables. A *P* value of < 0.05 was considered statistically significant.

## Results

### Demographics data

Table 1 shows that 63.6% of students had an age that ranged from 20 to 25 years, 71.5% were females, 95.8% had a Saudi nationality, and 76.5% were unmarried. Furthermore, 88.6% had a bachelor's degree of education, 59% had a medical specialty, and 8.1% had chronic diseases. More than half (52.4%) knew

**Table 1: Distribution of studied participants according to their characters, specialty, chronic diseases, knowing someone diagnosed with COVID-19 this year, and having seasonal influenza vaccine before (No. 332)**

Variable	No. (%)
Age	
>31	38 (11.4)
18-19	51 (15.4)
20-25	211 (63.6)
26-30	32 (9.6)
Gender	
Female	244 (71.5)
Male	88 (26.5)
Nationality	
Saudi	318 (95.8)
Non-Saudi	14 (4.2)
Marital status	
Not married	254 (76.5)
Married	78 (23.5)
Education level	
Bachelor's degree	294 (88.6)
Diploma	31 (9.3)
Master's degree	7 (2.1)
Specialty	
Medical	196 (59)
Non-medical	136 (41)
Do you have any chronic diseases?	
No	305 (91.9)
Yes	27 (8.1)
Do you know anyone who has been diagnosed in your circle with coronavirus this year?	
No	158 (47.6)
Yes	174 (52.4)
Did you get the seasonal influenza vaccine before?	
No	156 (47)
Not sure	59 (17.8)
Yes	117 (35.2)

someone diagnosed with COVID-19 this year, and 35.2% got the seasonal influenza vaccine before.

### Diffusion of information about COVID-19

A total of 81.6% of students thought that their information about COVID-19 was enough. Furthermore, 68.4% believe that there is sufficient information about COVID-19 in Saudi society. A total of 90.4% of participants had trust in the ability of the health system to manage this pandemic.

Regarding the source of information, the Website of the Ministry of Health was the most trusted source for 97.6%, followed by the websites of the International Health Organization (WHO, CDC) for 63.9%, to a lesser extent 54.8% trust in doctors or other healthcare worker and 44.6% trust on the other National Health Agency's Websites as a source of information. [Table 2]

### Beliefs and barriers toward COVID-19 vaccine

Table 3 shows that 66.6% and 62.3% of students thought that the COVID-19 vaccine would be safe and effective, respectively.

**Table 2: Distribution of studied participants according to diffusion of information about COVID -19 (No.: 332)**

Variable	No. (%)
Do you think your information about COVID-19 is enough?	
No	61 (18.4)
Yes	271 (81.6)
The available information about coronavirus sufficient in Saudi society?	
No	33 (9.9)
Do not know	72 (21.7)
Yes	227 (68.4)
Do you have faith/trust in the health system to manage the situation?	
No	20 (6)
Do not know	300 (90.4)
Yes	
Which of the following is the most trusted source of information for you?	
Website of Ministry of Health	324 (97.6)
Other National Health Agency's Websites	148 (44.6)
International Health Organization Websites (WHO, CDC)	212 (63.9)
Doctors or other healthcare providers	182 (54.8)
Scientific books or journals	30 (9)
Radio or podcasts	5 (1.5)
Friends	12 (3.6)
Social media platforms	30 (9)
TV	18 (5.4)
Family	21 (6.3)
Newspapers	6 (1.8)

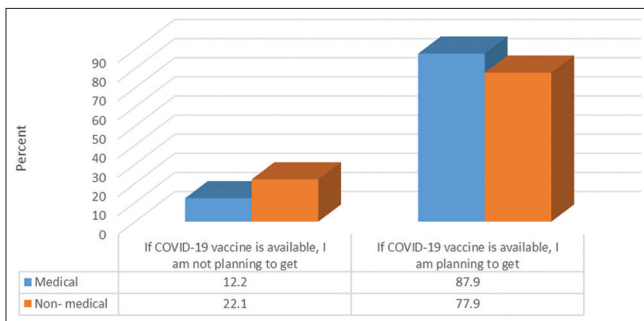
Most of them (75.3%) thought that vaccine is the best way to avoid the complications of COVID-19, and 89.5% thought that greater public awareness is needed about the COVID-19 vaccine. Most of the students (83.7%) reported that they plan to get a vaccine whenever it is available.

On the other hand, the most common reasons for those who were not planning to get the vaccine, their concerns regarding the vaccine's side effects (72.2%), they did not need the vaccine because they do all the right things like washing hands (40.7%) and they did not believe that the vaccine will stop the infection (12.9%). Most of the students who were not planning to get the vaccine reported that they would not take it in any situation (53.7%). Of them, the most common scenarios that can make them more likely to get it are if it was compulsory by the government (MOH) (51.8%) and if it was mandatory by my job (35.1%).

Table 4 shows that students who thought that the COVID-19 vaccine would be safe and effective, who believed that vaccine would be the best way to avoid the complications of COVID-19, who thought that their information about COVID-19 is enough, and who had trust in the health system to manage the situation had a significantly higher percentage of those who were planning to get COVID-19 vaccine if available ( $P < 0.05$ ). On the other hand, a nonsignificant relationship was found between planning to get the vaccine if available and students' characters, having chronic diseases, knowing someone diagnosed with COVID-19 this year, or having seasonal influenza vaccine before ( $P > 0.05$ ).

**Table 3: Distribution of studied participants according to their beliefs and barriers toward COVID-19 vaccination (No. 332)**

Variable	No. (%)
Do you think that the COVID-19 vaccine, whenever available, would be safe?	
No	16 (4.8)
Do not know	95 (28.6)
Yes	221 (66.6)
Do you think that the COVID-19 vaccine, whenever available, would be effective?	
No	17 (5.1)
Do not know	108 (32.5)
Yes	207 (62.3)
Do you think that the best way to avoid the complications of COVID-19 is by getting the vaccine?	
No	25 (7.5)
Do not know	57 (17.2)
Yes	250 (75.3)
Do you think that greater public awareness is needed about COVID-19 vaccine?	
No	35 (10.5)
Yes	297 (89.5)
If the COVID-19 vaccine is available, are you planning to get it? if “Yes,” please stop here. and if “No,” please answer the following questions.	
No	54 (16.3)
Yes	278 (83.7)
Check which statement shows why you do not plan to get COVID-19 vaccine (check all that apply): (No. 54)	
I am concerned about the vaccine’s side effects	39 (72.2)
I don’t believe that the vaccine will stop the infection	16 (29.9)
I don’t need the vaccine because I do all the right things. I wash my hands and wear a mask and gloves	22 (40.7)
I don’t like needles	3 (5.5)
The COVID-19 vaccine is a conspiracy	3 (5.5)
Other	4 (7.4)
Under those scenarios, would you be more likely to get the COVID-19 vaccine? (No. 54)	
If my physician recommended it to me	10 (18.5)
If it was mandatory by my job	19 (35.1)
If it was compulsory by the government (MOH)	28 (51.8)
If my family or friends got vaccinated	8 (14.8)
If I know that more studies showed that the vaccine is safe and effective.	
I would not take it in any situation	29 (53.7)
If there is a way other than injection	9 (16.6)
Other	1 (1.8)



**Figure 1: Relationship between planning to have COVID-19 vaccine if available and participants’ specialty. N. B.: ( $\chi^2 = 5.67, P \text{ value} = 0.017$ )**

Figure 1 shows that medical specialty students had a significantly higher percentage of those planning to get the COVID-19 vaccine if available ( $P < 0.05$ ).

Table 5 shows that students of an age ranging from 18 to 19 years had a significantly higher percentage of those who thought that hating needles was a barrier to getting the vaccine ( $P < 0.05$ ). And students with ages ranging from 20 to 25 years had a significantly higher percentage of those whose motivating

scenario to get the vaccine is that their physician recommended it ( $P < 0.05$ ). On the other hand, a nonsignificant relationship was found between other barriers to the COVID-19 vaccine and other reasons encouraging participants to get it and participants’ age ( $P > 0.05$ ).

Table 6 shows that a nonsignificant relationship was found between barriers to COVID-19 vaccine and reasons encouraging the participants to get it and participants’ gender ( $P > 0.05$ ).

Table 7 shows that students of nonmedical specialty had a significantly higher percentage of those concerned about the vaccine’s side effects, who did not need the vaccine because they do all the right things as washing hands and wearing a mask and gloves. And they had a significantly higher percentage of those willing to take the vaccine if their family or friends got it ( $P < 0.05$ ).

## Discussion

As of September 24, 2021, in the Kingdom of Saudi Arabia (KSA), over 546 thousand people have been infected and 8,688 people

**Table 4: Relationship between planning to have COVID-19 vaccine if available and participants' characters, specialty, chronic diseases, knowing someone diagnosed with COVID-19 this year, having seasonal influenza vaccine before, and participants' information about COVID-19 (No. 332)**

Variable	If the COVID-19 vaccine is available, are you planning to get it?		$\chi^2$	P
	No No. (%)	Yes No. (%)		
Age				
18-19	7 (13.7)	44 (86.3)	1.26	0.737
20-25	35 (16.6)	176 (83.4)		
26-30	7 (21.9)	25 (78.1)		
>31	5 (13.2)	33 (86.8)		
Gender				
Female	42 (17.2)	202 (82.8)	0.6	0.436
Male	12 (13.6)	76 (86.4)		
Nationality				
Saudi	51 (16)	267 (84)	0.28	0.598
Non-Saudi	3 (21.4)	11 (78.6)		
Marital status				
Not married	42 (16.2)	212 (83.5)	0.05	0.81
married	12 (15.4)	66 (84.6)		
Education level				
Bachelor's degree	50 (17)	244 (83)	1.12	0.569
Diploma	3 (9.7)	28 (90.3)		
Master's degree	1 (14.3)	6 (85.7)		
Do you have any chronic diseases?				
No	50 (16.4)	255 (83.6)	0.04	0.831
Yes	4 (14.8)	23 (85.2)		
Do you know anyone who has been diagnosed in your circle with coronavirus this year?				
No	25 (15.8)	133 (84.2)	0.04	0.835
Yes	29 (16.7)	145 (83.3)		
Did you get the seasonal influenza vaccine before?				
No	24 (15.4)	132 (84.6)	4.74	0.093
Not sure	15 (25.4)	44 (74.6)		
Yes	15 (12.8)	102 (87.2)		
Do you think that the COVID-19 vaccine, whenever available, would be safe?				
No	15 (93.8)	1 (6.3)	107.08	<0.001
Do not know	29 (30.5)	66 (69.5)		
Yes	10 (4.5)	211 (95.5)		
Do you think that the COVID-19 vaccine, whenever available, would be effective?				
No	9 (52.9)	8 (47.1)	49.63	<0.001
Do not know	33 (30.6)	75 (69.4)		
Yes	12 (5.8)	195 (94.2)		
Do you think that the best way to avoid the complications of COVID-19 is by getting the vaccine?				
No	20 (80)	5 (20)	98.7	<0.001
Do not know	17 (29.8)	40 (70.2)		
Yes	17 (6.8)	233 (93.2)		
Do you think that greater public awareness is needed about COVID-19 vaccine?				
No	7 (20)	28 (80)	0.4	0.527
Yes	47 (15.8)	250 (84.2)		
Do you think your information about COVID-19 is enough?				
No	16 (26.2)	45 (73.8)	5.44	0.02
Yes	38 (14)	233 (86)		
Is the available information about coronavirus sufficient in Saudi society?				
No	10 (30.3)	23 (69.7)	5.32	0.07
Do not know	11 (15.3)	61 (84.7)		
Yes	33 (14.5)	194 (85.5)		
Do you have faith/trust in the health system to manage the situation?				
No	6 (50)	6 (50)	24.5	<0.001
Do not know	9 (45)	11 (55)		
Yes	39 (13)	261 (87)		

**Table 5: Relationship between barriers to COVID-19 vaccine and reasons encouraging participants to get it and participants' age**

Variable	Age				$\chi^2$	P
	18-19	20-25	26-30	>31		
Check which statement shows why you do not plan to get COVID-19 vaccine (check all that apply)						
I am concerned about the vaccine's side effects	3 (7.7)	25 (64.1)	7 (17.9)	4 (10.3)	4.9	0.179
I don't believe that the vaccine will stop the infection	2 (12.5)	9 (56.3)	2 (12.5)	3 (18.8)	1.14	0.767
I don't need the vaccine because I do all the right things. I wash my hands and wear a mask and gloves	3 (13.6)	14 (63.6)	2 (9.1)	3 (13.6)	0.15	0.985
I don't like needles	3 (100)	0 (0.0)	0 (0.0)	0 (0.0)	16.02	0.001
The COVID-19 vaccine is a conspiracy	0 (0.0)	2 (66.7)	1 (33.3)	0 (0.0)	2.57	0.462
Other	0 (0.0)	0 (0.0)	4 (100)	0 (0.0)	2.33	0.506
Under those scenarios, would you be more likely to get the COVID-19 vaccine?						
If my physician recommended it to me	0 (0.0)	6 (60)	4 (40)	0 (0.0)	12.64	0.005
If it was mandatory by my job	5 (26.3)	12 (63.2)	1 (5.3)	1 (5.3)	2.64	0.449
If it was compulsory by the government (MOH)	3 (10.7)	18 (64.3)	6 (21.4)	1 (3.6)	6.49	0.09
If my family or friends got vaccinated	0 (0.0)	6 (75)	1 (12.5)	1 (12.5)	1.5	0.681
If I know that more studies showed that the vaccine is safe and effective.	4 (13.8)	21 (72.4)	1 (3.4)	3 (10.3)	1.74	0.628
I would not take it in any situation	0 (0.0)	6 (66.7)	1 (11.1)	2 (22.2)	2.39	0.495
If there is a way other than injection	0 (0.0)	1 (50)	1 (50)	0 (0.0)	2.05	0.561
Other	0 (0.0)	1 (100)	0 (0.0)	0 (0.0)	0.57	0.902

**Table 6: Relationship between barriers to COVID-19 vaccine and reasons encouraging participants to get it and participants' gender**

Variable	Gender		$\chi^2$	P
	Female No. (%)	Male No. (%)		
Check which statement shows why you do not plan to get COVID-19 vaccine (check all that apply).				
I am concerned about the vaccine's side effects	30 (76.9)	9 (23.1)	0.27	0.597
I don't believe that the vaccine will stop the infection	13 (81.3)	3 (18.8)	0.52	0.467
I don't need the vaccine because I do all the right things. I wash my hands and wear a mask and gloves	17 (77.3)	5 (22.7)	0.18	0.672
I don't like needles	1 (33.3)	2 (66.7)	2.49	0.114
The COVID-19 vaccine is a conspiracy	3 (100)	0 (0.0)	1.09	0.295
Other	4 (100)	0 (0.0)	1.46	0.226
Under those scenarios, would you be more likely to get the COVID-19 vaccine?				
If my physician recommended it to me	7 (70)	3 (30)	0.06	0.799
If it was mandatory by my job	13 (68.4)	6 (31.6)	0.26	0.606
If it was compulsory by the government (MOH)	21 (75)	7 (25)	0.03	0.085
If my family or friends got vaccinated	8 (100)	0 (0.0)	2.95	0.086
If I know that more studies showed that the vaccine is safe and effective.	24 (82.8)	5 (17.2)	1.4	0.237
I would not take it in any situation	7 (77.8)	2 (22.2)	0.08	0.768
If there is a way other than injection	2 (100)	0 (0.0)	0.72	0.394
Other	1 (100)	0 (0.0)	0.36	0.548

have died because of SARS-CoV-2 infection.<sup>[21]</sup> Prior studies have noted the importance of vaccinations in preventing the ongoing pandemic.<sup>[2,7]</sup> Vaccine acceptance varies among the general population depending on many factors such as time, space, ethnicity, social class, and different human behavior.<sup>[9,11,22-24]</sup> This study set out with the aim of assessing the acceptance rate of the COVID-19 vaccine among Taif University students and evaluating the student's beliefs and thoughts toward taking vaccine.

Our research found that out of 332 participants, 278 (83.7) said yes to uptake the COVID-19 vaccine, whereas 54 (16.3) said no. Furthermore, study participants who thought that the vaccine is safe (95.5%), effective (94.2%), and the best way to prevent the complication of COVID-19 infection (93.2%) have a higher rate to accept the vaccine, whereas fearing side effects was the main reason

for vaccine refusal (72.2%). Having enough information about the COVID-19 vaccine (86%) and trust in the health system (87%) are considered a good explanation of willingness to take the vaccine.

As we expect, our result shows that there is a highly significant association between planning to get the vaccine and students' positive thoughts about vaccine safety and effectiveness, in addition to those who thought that the vaccine well prevent the complication of COVID-19 infection. As well as a result of a previous study,<sup>[25]</sup> which, in turn, highlights the importance of positive believes as major factors related to the acceptance of the vaccine.

Also, in our cohort, we find a significant relation between trusting to the MOH and intent to vaccinate, which is similar to the findings by Lazarus *et al.*<sup>[26]</sup> This is a strong point to consider as

**Table 7: Relationship between barriers to COVID-19 vaccine and reasons encouraging participants to get it and participants' specialty**

Variable	Specialty		$\chi^2$	P
	Medical No. (%)	Non-medical No. (%)		
Check which statement shows why you do not plan to get COVID-19 vaccine (check all that apply).				
I am concerned about the vaccine's side effects	16 (41)	23 (59)	5.84	0.016
I don't believe that the vaccine will stop the infection	7 (43.8)	9 (56.3)	1.59	0.206
I don't need the vaccine because I do all the right things. I wash my hands and wear a mask and gloves	8 (36.4)	14 (63.6)	4.95	0.026
I don't like needles	1 (33.3)	2 (66.7)	0.81	0.366
The COVID-19 vaccine is a conspiracy	1 (33.3)	2 (66.7)	0.81	0.366
Other	2 (50)	2 (50)	0.13	0.715
Under those scenarios, would you be more likely to get the COVID-19 vaccine?				
If my physician recommended it to me	6 (60)	4 (40)	0.004	0.95
If it was mandatory by my job	8 (42.1)	11 (57.9)	2.38	0.122
If it was compulsory by the government (MOH)	14 (50)	14 (50)	1.03	0.31
If my family or friends got vaccinated	2 (25)	6 (75)	3.92	0.048
If I know that more studies showed that the vaccine is safe and effective.	16 (55.2)	13 (44.4)	0.19	0.658
I would not take it in any situation	4 (44.4)	5 (55.6)	0.81	0.367
If there is a way other than injection	1 (50)	1 (50)	0.06	0.794
Other	0 (0.0)	1 (100)	1.44	0.229

several studies have reported that lack of trust and information was one of the hesitations causes to vaccinate.<sup>[27,28]</sup>

Moreover, a high percentage of the students aged 20–25 years report that they will take the vaccine if their doctor recommends it to them as a motivating scenario, which indicates the positive influence of the physician in our society.

Among our participants, a medical specialty student significantly had a higher percentage of planning for vaccination than others in context to recently published data.<sup>[29]</sup> This finding is most probably due to their awareness about vaccine development and safety as Graham *et al.* explain it.<sup>[30]</sup>

To more surprising results, there is no significance between intent to get the vaccine and knowing someone who had been infected by COVID-19 this year. This is opposite to the published Jordanian study, which reaches a significant relationship between those two variables.<sup>[20]</sup> The best explanation of this difference from our view is that it is a time of conducting the study as Jordanian was conducted on October 2020 where there was a lot of information missing about the nature of the infection and the high rise of the number of cases unlike ours.

Furthermore, there is insignificance between the participants' character as (having chronic illness and history of getting influenza vaccine before) and their planning to get the vaccine in contrast to a recently published Saudi study that states those people have a higher percent of intent to get a vaccine.<sup>[25]</sup>

Regarding barriers to getting vaccines, in our study, nonmedical students had a significantly higher percentage of those who concern about the side effects of the vaccine and those who thought they did not need the vaccine because they are already following the protective measurement. This partially agrees with several previous

studies which state that concern about side effects is one of the common hesitancy factor in the general population.<sup>[31–33]</sup>

In the light of the present study's results, primary healthcare physicians could play an important role in correcting the misconceptions and wrong beliefs concerning COVID-19 vaccine among university students through health education and consequently encourage them to uptake the vaccine.

The current research has some drawbacks; first, it was performed using an online self-administered questionnaire. Several factors, such as internet accessibility and social media network access, may directly affect the sample population. As a consequence, it is necessary to account for reporting bias. Second, the current research did not look at the reasons for vaccine acceptance or the various obstacles to vaccination. Third, since our sample was relatively small and restricted to Taif University students, further study was needed to investigate the barriers and acceptance of the vaccine among University students in the rest of Saudi Arabia.

## Conclusion

In conclusion, our research findings show that there is a strong association between vaccine initiation and positive attitudes toward vaccine safety and effectiveness among students, the significant conclusion of our research was that medical specialty students had a significantly higher percentage of vaccination initiation than other specialty students, this is most likely due to their knowledge of vaccine production and safety, also we found that there is a strong connection between trusting the MOH and vaccine intention, which we regard as a strong point in our culture and society.

## Key points

- Acceptance rate for uptaking of COVID-19 vaccine among Taif University students is high

- Perception of the vaccine safety, its effectiveness, and that it is the best way to prevent the complication of COVID-19 infection are essential to accept the vaccine
- Fearing vaccine side effects was the main reason for vaccine refusal
- Primary healthcare physicians could play an important role in improving uptake of the vaccine.

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## Conflicts of interest

There are no conflicts of interest.

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