

Perception of Saudi Population about COVID-19: A Cross-Sectional Study

Abstract

Background: The evolving COVID-19 outbreak requires a high level of population awareness and other measures to protect public health. **Objectives:** In this study, we aimed to identify knowledge, awareness, and fears of the Saudi population regarding COVID-19 during this pandemic. **Methods:** A cross-sectional survey study was conducted from April to May 2020 in different Saudi areas. Data were collected via online survey software (Google Forms), and the data collection tool was developed and validated by the study authors to fulfill the study objectives. Data were analyzed using SPSS version 21.0. Descriptive statistics and Chi-square tests were used for comparison between groups. The statistical significance was considered when the P value ≤ 0.05 . **Results:** Study participants included 2982 people with 66.8% females. The average percentage of the awareness levels of the current study population was 68%. The vast majority (95.1%) did not know how the virus spread while 94.7% of the participants know the distance that a person should maintain from another person. Significantly higher percentages (70%) knew about and were aware of the prevention methods, including social distancing and hand hygiene, and 73.5% knew that elderly people with chronic diseases are the highest risk group to become infected. The highest significant fear of COVID-19 was from lack of treatment, which was reported by 77.5% of the participants with a P value of < 0.05 . **Conclusions:** Our study shows that the population has acceptable knowledge about COVID-19. Education and work-based awareness programs about COVID-19 are needed, especially for prevention and treatment aspects.

Keywords: Awareness, COVID-19, fears, knowledge, Saudi Arabia

Introduction

Corona-virus (CoV) is one of the major pathogens that primarily targets the human respiratory system; however, in 2003, CoV was not considered to be highly pathogenic to humans.^[1]

In 2012, a new CoV was responsible for the Middle East Respiratory Syndrome. Both of them were considered a threat to global health security. Currently, a new CoV, (2019-nCoV) was identified in December 2019 in the Chinese city of Wuhan at which time the first case with pneumonia of an unknown cause was reported.^[2]

The new name refers to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus is one of the most challenging issues facing worldwide in 2020 and perhaps through new century. Multiplatforms, websites, and hundreds of daily published studies deal with this virus to obtain the most accurate information about it.

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SARS-CoV-2 infected patients develop mild symptoms, such as dry cough, sore throat, and fever.^[2] Most of these cases have spontaneously recovered. However, some have developed severe complications, including organ failure, septic shock, pulmonary edema, severe pneumonia, and acute respiratory distress syndrome.^[3]

This virus is transmitted by direct contact with scattered droplets from sneezing or coughing. Also, a human being can be infected by touching surfaces contaminated with this virus and then touching their facial areas (eye, nose).^[4] More than 43,000 confirmed cases have identified in 28 countries, with $>99\%$ of patients in China and 1115 deaths as of 11th February.^[5]

According to the Istituto Superiore di Sanità as of 11th March, Italy has had 12,462 confirmed cases and 827 deaths.^[6]

In the United Kingdom, they estimate that on 23rd March, there were 102,000 (median; 95% credible range 54,000–155,000) new cases and 320 (211–412) new critical

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care reports, with 464,000 (266,000–628,000) cumulative cases since 16th February.^[7]

On March 30, 2020, there were 7448 reported cases and 89 reported deaths in Canada.^[8] On other hand, on May 1, the total confirmed case in Saudi Arabia were reported as 22,753 with 162 deaths.^[9] On the same day, the number of confirmed cases in the United States was then ten times the cases documented in Saudi Arabia (1,095,304).^[10]

It is highly advisable to keep individual awareness about the critical information to limiting spread this pandemic and providing excellent health care during this period. However, until now, there have not been any studies of perception and awareness of COVID-19 among the Saudi population. So, in our research, we aimed to investigate the perceptions of the Saudi population about the essential general concepts concerning COVID-19.

Methods

A cross-sectional study was designed to assess the perception and awareness of COVID-19 among the Saudi community. The samples of 2998 subjects were collected randomly through an online questionnaire from April to May 2020. Ethics approval was acquired from the Research Ethics Committee at Taif University (41-00168). The survey included two parts. The first part included questions about the sociodemographic data, such as age, gender, marital state, nationality, region of residence, education level, profession/job, specialty, and any chronic diseases. The second part addressed general COVID-19 knowledge based on information from the Centers for Disease Control and World Health Organization. We asked about the most prominent information (definition of Coronaviruses and COVID-19, the symptoms, incubation period for the virus, methods of spread, the primary techniques to use for prevention, diagnostic tools, assessment of some wrong public concepts around the vaccine and the treatment of viruses, and the rang of societal worries.

Data collection

We designed a validated version of the Arabic questionnaire. The online questionnaire was shared through social media applications, such as WhatsApp, Telegram, Twitter, Facebook, and Instagram. Before data collection, all participants were informed about the nature of the study, and their participation was voluntary, and the electronic consents were then obtained from those who agreed to participate in the study. All Saudi participants in the study were over 15-year old.

Statistical analysis

The data will be entered using Microsoft Excel 2010. They will be coded for analysis purposes using the Statistical Package for the Social Sciences: SPSS program version 21.0. Data analysis included descriptive statistics in addition to the Chi-square test for comparison between groups. Statistical significance is considered to be P value ≤ 0.05 .

Results

The total number of the current study participants was 2982, and almost two-thirds of them were females at 66.8%, 50.8% were single, and 69.1% have a university level educational. More than one-third (35%) were students, and 34.9% were from the Eastern region. Almost 14% of the participants reported suffering from diseases, and the vast majority (94.8%) were not using any antihypertensive medications. A total of 638 (21.4%) reported going to crowded places during the last two weeks before the study, and 21.6% of the participants have a health practitioner in their family. Only 1.1% reported traveling to one of the affected countries in March. Social media was the main source of knowledge about COVID-19 among the current study participants at 75.1%. Data are shown in Table 1.

The level of general awareness about COVID-19 among the study participants is shown in Tables 2 and 3. Overall, the average percentage of the level of awareness of the current study population was 68%, indicating an acceptable knowledge level. More than half (51.4%) of the respondents wrongly thought that COVID-19 is a large group of viruses that may cause disease in animals and humans, whereas only 48.6% knew the correct answer although the difference was not statistically significant. On the other hand, a significantly ($P < 0.05$) higher percentage of the participant know that it is an infectious disease caused by the newly discovered coronavirus, not like the flue at 75.6%. Only 36.6% of the participants knew that the virus is considered biological warfare, whereas the vast majority (90.9%) correctly knew symptoms. The vast majority (95.1%) did not know how the virus spread, and only 0.8% correctly answered it as “by dispersed drops only when the person sneezes.” The distance that a person should maintain between another person is more than 1 m (3 ft), and this fact was acknowledged by 94.7% of the participants. Significantly higher percentages (70%) knew and were aware of the prevention methods including social distancing and hand hygiene. Similarly, a statistically significant higher percentage of the respondents knew that elderly people with chronic diseases are at the highest risk for becoming infected with COVID-19 at 73.55% with a P value of < 0.05 . Almost 94% were aware that there is no vaccine for the disease, 84.5% knew that the incubation period is from 1 to 14 days, and 87.2% reported that the disease is diagnosed through nasal swabbing.

Participants' fears of the COVID-19 pandemic are shown in Table 4 and Figure 1. The results revealed that the highest significant fear was lack of treatment, which was reported by 77.5% of the participants with a P value of < 0.05 . Additionally, a statistically significant higher percentage of the participants (58.5%) expressed fears that he/she or one of the family members would become infected with a P value < 0.05 . On the other hand, the

Table 1: General factor information (n=2982)

Factor	n	%
Gender		
Male	989	33.2%
Female	1993	66.8%
MS		
Single	1516	50.8%
Married	1421	47.7%
Divorced	45	1.5%
Education		
Intermediate	118	4%
Secondary	663	22.2%
University	2060	69.1%
Postgraduate	141	4.7%
Job		
I don't work	564	18.9%
Student	1045	35%
Teacher	357	12%
Government employee	153	5.1%
Engineer	79	2.6%
Health sector employee	226	7.6%
Lawyer	11	0.4%
Pilot	7	0.2%
Military sector employee	81	2.7%
Housewife	182	6.1%
Free business/trade employee	82	2.7%
Driver	3	0.1%
Cashier	3	0.1%
Sales representative	7	0.2%
Accountant	15	0.5%
Programmer	11	0.4%
Security Guard	11	0.4%
Seller	8	0.3%
Other	137	4.6%
Region		
North	460	15.4%
South	476	16%
Central	492	16.5%
Eastern	1041	34.9%
Western	513	17.2%
Do you suffer from any diseases?		
No	2572	86.3%
Yes	410	13.7%
Do you used any the anti-HNT medications?		
Lotensin	7	0.2%
Vasotec	2	0.1%
Zestril, Prinivil	10	0.3%
Accupril	4	0.1%
Altace	1	0.0003%
Other anti-HTN drugs	130	4.4%
I don't use any of Anti-HTN drugs	2828	94.8%
Are you pregnant		
No	2346	97.5%
Yes	60	2.5%

Contd...

Table 1: Contd...

Factor	n	%
In the last two weeks, do you go to places crowded with people?		
No	2344	78.6%
Yes	638	21.4%
Is a member of your family a health practitioner?		
No	2338	78.4%
Yes	644	21.6%
Have you been travelling to one of the affected countries in March (Italy, Britain, America, China)		
No	2950	98.9%
Yes	32	1.1%
What are the sources of your knowledge about the virus?		
Social media	2238	75.1%
Television	439	14.7%
Newspapers	61	2%
A member of your family	67	2.2%

vast majority (98.5%) showed no fear toward low awareness, and 65.4% of the participants did not express any fear of economic collapse caused by this pandemic. Moreover, almost all of the respondents (99.8%) did not fear early unblock. All *P* values were statistically significant.

The relationship between demographic data and general awareness:

As shown in Table 5, the relationship between demographic factors (gender, age, marital status, and education level) and general awareness was tested using the Chi-square test at 0.05. The significant relationships were selected and are presented in Table 5.

A statistically significant relationship between age and the definitions of coronavirus was found and was higher among young-aged participants ($X^2 = 88.68, P < 0.05$). Also, a significant relationship between marital status and awareness level was noted and was higher among singles ($X^2 = 47.55, P < 0.05$). These significant relationships provide indications that single and young people are more aware of COVID-19 issues than their older counterparts.

A relationship between gender and thinking that the virus was produced in a factory (biological warfare) with higher percentage in females ($X^2 = 65.27, P < 0.05$) was found, indicating that female was more aware of this issue than males. Also, a statistically significant relationship between age and thinking that the virus is a biological weapon was among elder participants ($X^2 = 28.66, P < 0.05$).

A relationship between age and awareness about the possibility of being infected with COVID-19 by someone who is asymptomatic or has mild symptoms ($X^2 = 39.23, P < 0.05$) was found, in which older people agreed with this issue more

Table 2: The general awareness (n=2982)

Statement		n	%	χ^2/P
What is the Corona virus?	It is a large group of viruses that may cause disease in animals and humans	1534	51.4	2.48/0.115
	It is a large group of viruses that may cause disease to humans only	1448	48.6	
What is the Covid-19	It is an infectious disease caused by the newly discovered corona virus, not like the flue	2253	75.6	778.87**/0.00
	It is an infectious disease caused by the newly discovered corona virus, like the flue	729	24.4	
Do you think it is a factory virus (Biological warfare)?	Yes	1091	36.6	366.60**/0.00
	No	527	17.7	
	I don't know	1364	45.7	
What are the common symptoms of COVID-19?	Sort throat	136	4.6	6923.39**/0.00
	Fever, fatigue, dry cough	2712	90.9	
	Fever only	35	1.2	
	I don't know	99	3.3	
How is it spread?	By infected persons only	60	2.0	13223.90**/0.00
	By dispersed drops only when the person sneezes	24	0.8	
	Only when the virus-carrying surfaces are touched	23	0.8	
	Through the air by mixing with infected people	6	0.2	
	I don't know	2837	95.1	
	6.0	32	1.1	
What is the distance that you should make between you and the people?	3 ft (over 1 m)	2824	94.7	2383.49**/0.00
	<1 m	158	5.3	
Can a person be infected with COVID-19 by someone who has asymptomatic or has mild symptoms?	Yes	2353	78.9	2840.83**/0.00
	No	151	5.1	
	I don't know	478	16.0	
What are the prevention methods?				
Social spacing	Yes	2641	88.6	1773.98**/0.00
	No	341	11.4	
Avoid direct contact with anyone	Yes	2102	70.5	500.77**/0.00
	No	880	29.5	
Good respiratory hygiene	Yes	2248	75.4	768.68**/0.00
	No	734	24.6	
Avoid touching your eyes, nose and mouth.	Yes	2281	76.5	837.16**/0.00
	No	701	23.5	
Keep a distance	Yes	2285	76.6	845.66**/0.00
	No	697	23.4	
Clean your hand regularly	Yes	2489	83.5	1336.02**/0.00
	No	493	16.5	
I don't know	Yes	30	1.0	2863.21**/0.00
	No	2952	99.0	
Who have high risk of developing the disease?	Everybody	778	26.1	2465.34**/0.00
	Elderly people with chronic diseases	2193	73.5	
	Young and teenagers	11	0.4	
Are antibiotics effective in preventing disease?	Yes	254	8.5	980.74**/0.00
	No	1641	55	
	I don't know	1087		
Does eating garlic help preventing disease?	Yes	348	11.7	711.04**/0.00
	No	1518	50.9	
	I don't know	1116	37.4	
Does circulation of paper money transmit infection?	Yes	2508	84.1	3479.17**/0.00
	No	137	4.6	
	I don't know	337	11.3	

Contd...

Table 2: Contd...

Statement		n	%	χ^2/P
Is there yet vaccine for disease?	Yes	177	5.9	2316.02**/0.00
	No	2805	94.1	
Does bathing in hot protect against infection with corona?	Yes	163	5.5	1638.64**/0.00
	No	1954	65.5	
	I don't know	865	29.0	
Do hot and humid climates kill the virus?	Yes	602	20.2	236.33**/0.00
	No	1237	41.5	
	I don't know	1143	38.3	
When will the sanitary isolation take place?	1.0	1210	40.6	105.92**/0.00
	2.0	1772	59.4	
When should the mussel be worn?	In all cases	1175	39.4	133.945**/0.00
	Only when suffer from respiratory symptoms	1807	60.6	
How long does Covid-19 incubation take?	Between one and 14 days	2519	84.5	3522.53**/0.00
	21 days	312	10.5	
	I don't know	151	5.1	
Can Covid-19 be infected with a pet (such as cats)?	Maybe	619	20.8	216.02**/0.00
	No	1225	41.1	
	I don't know	1138	38.2	
How will take the virus remain alive on the surfaces?	May extend from hours to days	2034	68.2	1658.80**/0.00
	Less than an hour and not days	359	12.0	
	I really don't know	589	19.8	
Does wearing the glove reduce infection and spread of the disease?	Yes	1912	64.1	1403.58**/0.00
	No	791	26.5	
	I don't know	279	9.4	
Is a pregnant woman more susceptible to HIV infection than nonpregnant women?	Yes	1393	46.7	352.78**/0.00
	No	558	18.7	
	I don't know	1031	34.6	
How is the disease diagnosed?	Swab from your nose	2599	87.2	6156.27**/0.00
	Antibody blood analysis	98	3.3	
	There is no clear way to diagnose	81	2.7	
	I don't know	204	6.8	
What is the treatment for the disease?	There is nothing clear yet	1629	54.6	1600.07**/0.00
	(Analgesics, cough medicine, fluids, rest, isolation)	761	25.5	
	Antimalarials	233	7.8	
	I don't know	359	12.0	
Do you feel nervous and uncomfortable as the days go by?	Yes	1780	59.7	113.03**/0.00
	No	1202	40.3	
Your own assessment of your health?	Very good	2388	80.1	3074.82**/0.00
	Medium	563	18.9	
	Weak	31	1.0	
Was your surgery canceled during this period?	Yes	151	5.1	2408.59**/0.00
	No	2831	94.9	
Was your medical appointment cancelled during this period?	No	1866	62.6	188.63**/0.00
	Yes	1116	37.4	
Do you find yourself psychologically ready to continue the stone and stop the work or any misfortune?	Yes	1620	54.5	618.65**/0.00
	No	770	25.9	
	I don't know	581	19.6	
Have you been subjected to home quarantine or quarantine?	Yes	690	23.1	860.63**/0.00
	No	2292	76.9	
Have you been infected with Corona virus?	Yes	115	3.9	25.3974**/0.00
	No	2867	96.1	

Contd...

Table 2: Contd...

Statement		n	%	χ^2/P
What do you want to know about this disease?	Methods of prevention	319	10.7	2155.99**/0.00
	Treatment developments	1839	61.7	
	The daily developments of the diseases	472	15.8	
	Professionals answer general inquiries in the fastest time and easiest way	352	11.8	
To what extend is your daily routine other than blocking your plans		6.13±2.79		
Evaluate your concern range of nervous and uncomfortable		5.89±2.57		

**P<0.05

Table 3: The level of awareness (n=2982)

Statement		n	%
What is the Corona virus?	False	1448	48.6
	True	1534	51.4
What is the Covid-19	False	729	24.4
	True	2253	75.6
Do you think it is a factory virus (Biological warfare)?	False	1891	63.4
	True	1091	36.6
What are the common symptoms of COVID-19?	False	270	9.1
	True	2712	90.9
What is the distance that you should make between you and the people?	False	158	5.3
	True	2824	94.7
Can a person be infected with COFED-19 by someone who has asymptotic or has mild symptoms?	False	629	21.1
	True	2353	78.9
Social spacing	False	341	11.4
	True	2641	88.6
Avoid direct contact with anyone	False	880	29.5
	True	2102	70.5
Good respiratory hygiene	False	734	24.6
	True	2248	75.4
Avoid touching your eyes, nose and mouth.	False	701	23.5
	True	2281	76.5
Keep a distance	False	697	23.4
	True	2285	76.6
Clean your hand regularly	False	493	16.5
	True	2489	83.5
Who have high risk of developing the disease?	False	789	26.5
	True	2193	73.5
Are antibiotics effectiveness in preventing disease	False	2728	91.5
	True	254	8.5
Does eating garlic help preventing disease?	False	2634	88.3
	True	348	11.7
Does circulation of paper money transmit infection?	False	474	15.9
	True	2508	84.1
Is there yet vaccine for disease?	False	177	5.9
	True	2805	94.1
Does bathing in hot protect against infection with corona?	False	163	5.5
	True	2819	94.5
Do hot and humid climates kill the virus?	False	602	20.2
	True	2380	79.8
How long does Covid-19 incubation take?	False	463	15.5
	True	2519	84.5
How will take the virus remain alive on the surfaces?	False	948	31.8
	True	2034	68.2

Contd...

Table 3: Contd...

Statement		n	%
Does wearing the glove reduce infection and spread of the disease?	False	1912	64.1
	True	1070	35.9
Does the pregnant women more susceptible to HIV infection than nonpregnant women?	False	1393	46.7
	True	1589	53.3
How is the disease diagnosed?	False	383	12.8
	True	2599	87.2
What is the treatment for the disease?	False	2221	74.5
	True	761	25.5
The average percentage of the level of awareness			68%

Table 4: The relationship between demographic data and general awareness (n=2982)

Statement	χ^2/P			
	Gender	Age	MS	Education
What is the Corona virus?				
It is a large group of viruses that may cause disease in animals and humans		88.68**/0.000	47.55**/0.000	
It is a large group of viruses that may cause disease to humans only				
Do you think it is a factory virus (Biological warfare)?				
Yes	65.27**/0.000			28.66**/0.000
No				
I don't know				
<1 m				
Can a person be infected with COFED-19 by someone who has asymptotic or has mild symptoms?				
Yes		39.23**/0.000	112.47**/0.01	
No				
I don't know				
Prevention methods Avoid direct contact with anyone				
Yes		25.54**/0.001	16.86**/0.000	
No				

**P<0.05

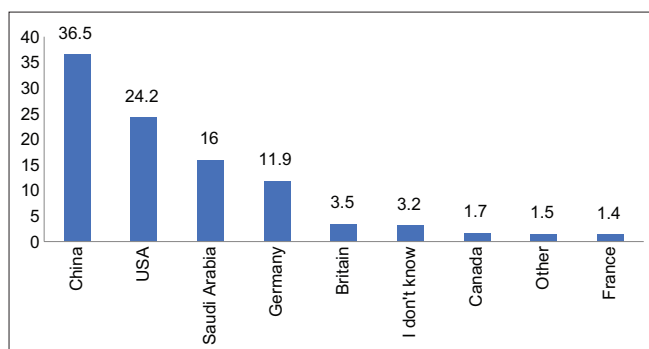


Figure 1: The most country that participants be able to offer treatment for the disease sure of the effectiveness

than younger ones ($P < 0.05$). Additionally, a relationship between marital status and the awareness of this issue also was shown ($X^2 = 112.47, P < 0.05$).

Similarly, younger aged and single participants showed significantly higher awareness levels regarding avoiding

direct contact with anyone at ($X^2 = 25.54, P < 0.05$) and ($X^2 = 16.86, P < 0.05$), respectively.

Discussion

In a cross-sectional survey of almost 3000 participants across the Kingdom of Saudi Arabia, we assessed population awareness about the COVID-19, and the results revealed an acceptable level of awareness. More than three quarters showed knowledge of its infectious nature, and the vast majority of people understand its symptoms although >95% did not know how it is spread.

It is well reported that raising public awareness about infectious diseases is one of the prevention milestones of these diseases that hinders progression of preventative measures. A higher level of awareness plays a substantial role in primary prevention and allows suspect individuals to recognize the symptoms early and take the necessary precautions in addition to seeking treatment at the initial

Table 5: The relationship between demographic data and general awareness (n=2982)

Statement	χ^2/P			
	Gender	Age	MS	Education
What is the Corona virus?				
It is a large group of viruses that may cause disease in animals and humans		88.68**/0.000	47.55**/0.000	
It is a large group of viruses that may cause disease to humans only				
Do you think it is a factory virus (Biological warfare)?				
Yes	65.27**/0.000			28.66**/0.000
No				
I don't know				
Less than one meter				
Can a person be infected with COFED-19 by someone who has asymptomatic or has mild symptoms?				
Yes		39.23**/0.000	112.47**/0.01	
No				
I don't know				
Prevention methods/Avoid direct contact with anyone				
Yes		25.54**/0.001	16.86**/0.000	
No				

**P<0.05

disease stage.^[11] Our results suggest an acceptable level of awareness among Saudi population. In a similar Egyptian study, Ahmed *et al.* suggested adequate awareness regarding infection and route of COVID-19 transmission.^[12] However, the estimated knowledge level in the current study is considered lower compared to a previously published local study in which the knowledge level exceeded 81% compared to 68% in the current study.^[13]

In accordance with a recently published study among the general public in the US and the UK^[14] and a Saudi local study,^[13] the current study respondents showed a high knowledge level about COVID-19 symptoms. Similar results were also obtained from university students in Jordan,^[15] putting them into consideration with respect to the differences among study populations.

COVID-19 is rapidly transmitted, and transmission can occur by close contact with an infected person.^[16-19] The vast majority of the current study's participants did not know how the virus is transmitted. Almost 94% of the respondents knew that a vaccine for COVID-19 as of the date of the study conduction is lacking. The respondents showed high awareness with the majority expressing knowledge about social distancing and also awareness of asymptomatic infection transmission. Previous studies among Chinese^[20] and Japanese^[21] populations showed similar findings regarding public knowledge toward COVID-19. In a multinational cross-sectional study that included participants from Jordan, Saudi Arabia, and Kuwait in which knowledge and practices toward COVID-19 were addressed, it was found that participants were still embracing misconceptions regarding COVID-19, leading to an insufficient practice of protective measures against COVID-19 infection.^[22] Our

results showed that 70% of the participating population knew and were aware of the prevention methods, including social distancing and hand hygiene.

WHO, along with public health agencies in the UK, the USA, and other countries, have issued guidelines that individuals with cardiovascular, chronic kidney, and chronic respiratory diseases, diabetes, and a range of other chronic conditions are individuals who should be considered at increased risk of infection with COVID-19.^[23-25] The current study participants presented good knowledge in this regard.

COVID-19 and its consequences cause fears, worries, and anxiety among populations worldwide. Compared with other conditions, fear is one characteristic traits of infectious diseases, and it is directly associated with disease transmission rates in addition to morbidity and mortality. The COVID-19 situation has been exacerbated owing to the insufficient control measures as well as the lack of effective therapeutic mechanisms.^[26-28] Our results support these findings since lack of treatment was the major fear of the current study respondents. In Japan, Shigemura *et al.* emphasized the COVID-19 economic impact and its effects on well-being in addition to the likely high levels of fear and panic behavior, including the stockpiling of resources, in the general population.^[29]

Conclusion

In conclusion, most of the current study participants have moderate levels of knowledge and perceptions about COVID-19. Lack of treatment represented the greatest fear generated by COVID-19. Our findings highlight the need for more education and awareness programs by the various types of mass media.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflict of interest

There are no conflicts of interest.

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