


ORIGINAL ARTICLE

Tendency of Patients to Delay Emergency Department Visits and Avoid Medical Care During the Viral COVID-19 Pandemic: A Cross-Sectional Survey Study in Saudi Arabia

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ABSTRACT

Background: Patients' avoidance of medical care and visiting emergency departments (EDs) during the viral coronavirus disease-2019 (COVID-19) pandemic has been reported in many countries; however, similar studies are almost absent in Saudi Arabia. We aimed to (1) study the tendency to avoid or delay medical care during the COVID-19 pandemic, (2) identify factors that affect patients' decision to visit an ED when required, and (3) examine the medical consequences and possible complications in terms of a patient's health due to avoiding medical care during the COVID-19 pandemic.

Methods: This was a cross-sectional study conducted using a descriptive and analytical survey to explore the prevalence of patient avoidance of medical care. The survey was distributed through social media websites to the population of Saudi Arabia.

Results: Of the 1,275 participants in this study, 51% were male and the majority (77.8%) were aged between 21 and 49 years. Forty-four percent ($n = 561$) of the participants had delayed or avoided medical care due to concerns about contracting COVID-19. A variety of significant factors were associated with delaying or avoiding medical care during the COVID-19 pandemic, including age, marital status, paying when seeking care, presence of comorbidities, and the level of anxiousness about visiting an ED during the pandemic. The multinomial logistic regression model highlighted that being very anxious significantly predicted avoidance of medical care.

Conclusions: Avoiding medical care during the pandemic is not uncommon. Many factors contribute to overall patients' avoidance and the consequences can be fatal. Patient education and efforts to decrease patients' anxiousness are the keys to decreasing avoidance and complications due to the late presentation.

Keywords: Medical Care Avoidance, Delayed Emergency Department Visits, Coronavirus Disease-2019, Pandemic, Public Health.

Introduction

In December 2019, a new virus was discovered in China, severe acute respiratory syndrome coronavirus 2, which was subsequently called coronavirus disease-2019 (COVID-19) [1]. The virus transmission occurred quickly, resulting in a global pandemic which causes acute respiratory distress syndrome [2].

Emergency Departments (EDs) have many responsibilities, including limiting the spread of infections, as it is the hospital's first line of defense

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against serious, infectious, and non-infectious diseases [3]. With the spread of the COVID-19 pandemic, the working routine in EDs changed profoundly [4]. Patients with COVID-19 may present with respiratory symptoms similar to other common viruses, posing a challenge for the early detection during triaging [5]. In northern Italy, in one of the areas that was hit hardest by the COVID-19 pandemic, an attending emergency medicine physician stated that the alarming speed of the spread of COVID-19 led to patients filling their hospitals which were not ready to deal with the huge numbers of patients in need of ventilator support [6].

According to the studies conducted in Hong Kong and in various European countries during the COVID-19 pandemic, there was a significant decline in the number of ED visits and seeking medical care [7-9]. This decline may be due to multiple reasons, the most notable one was that many people avoided medical facilities and healthcare personnel, including emergency doctors and nurses, due to the fear of contracting the virus. Other reasons included the lockdown measures during the pandemic and the rapid improvement of telemedicine, which contributed to reducing the need for visiting an ED [7].

A large number of serious cases avoided medical care, even to their own detriment, due to the fear of contracting the virus [9]. People may avoid medical care even when they suspect it may be necessary [10,11]. Patients with major health problems also tended to avoid seeking medical care [12,13]. This tendency can result in serious consequences, including a worse prognosis, increased comorbidity, and mortality [14,15].

The situation in Saudi Arabia has not been investigated. Therefore, we aimed to (1) study the tendency to avoid visiting EDs and avoiding medical care during the COVID-19 pandemic, (2) identify the factors that affect a patient's decision to visit an ED when required during the COVID-19 pandemic, and (3) examine the medical consequences and possible complications in terms of a patient's health due to avoiding EDs.

Methods

A descriptive and analytical electronic survey of the Saudi Arabian population was distributed from July 20 to August 7, 2020. The population was invited via social media websites and applications to participate in the study by completing a questionnaire. The questionnaire was anonymous to ensure confidentiality. All participants who responded to the invitation, signed the online informed consent and complied with the inclusion criteria included in the sample. Our inclusion criteria included people aged above 18 years, Arabic speakers, and living in Saudi Arabia. The study protocol and instrument were revised and approved by the Unit of Biomedical Ethics, Institutional Review Board, King Abdullah International Medical Research Center, Ministry of National Guard-Health Affairs, Saudi Arabia.

We calculated the sample size, using recent statistics from the General Authority for Statistics in Saudi Arabia [16], and the minimum required sample size

was 386 in order to achieve a confidence level of 95%, a margin of error of 5%, and a response distribution of 50%. However, a larger sample was included to study and analyze associations between co-variables. Finally, 1,275 eligible participants completed the questionnaire and were included in the data analysis.

The main outcome variable is the tendency to avoid medical care during the COVID-19 pandemic. It was assessed with a closed-ended question: During the COVID-19 pandemic, have you delayed or avoided seeking medical care due to concerns about contracting coronavirus (COVID-19)?

The impact of COVID-19 on avoiding EDs was assessed using a combination of questions. Because this topic is new, a newly developed survey based on previously validated questionnaires on the same topic was used. The final survey was modified according to our goals and aims and translated to Arabic by two authors and matched by a third author. The questionnaire consisted of five sections. The first section focused on demographic information. The second section inquired about feelings related to visiting EDs during the COVID-19 pandemic; the third section explored personal experiences of accessing assistance during the COVID-19 pandemic; the fourth section inquired about personal experiences of visiting an ED during the COVID-19 pandemic; and the fifth section inquired about possible complications and consequences of avoiding medical care during the COVID-19 pandemic. The co-variables were included within the sections of the survey and included demographic characteristics, the participants' degree of fear of being infected, and other variables.

The data were analyzed using Statistical Package for the Social Sciences version 25. For the categorical variables, frequency and percentage were calculated. The association between the categorical variables was analyzed using the chi-square (χ^2) test. The co-variables were compared and contrasted between gender and self-reported delaying or avoiding of medical care during the COVID-19 pandemic. The association between having an emergent medical condition and seeking care during the COVID-19 pandemic was calculated. A *p*-value of ≤ 0.05 was considered statistically significant. A logistic regression was done to predict patients' avoidance of EDs using the level of anxiousness and type of reaction once a participant has a condition that necessities going to an ED.

Results

Table 1 shows the sample's characteristics and their association with delaying or avoiding seeking medical care. The sample consisted of 1,275 participants, with half (51%) of them being male. In terms of age, the highest proportion (77.8%) was between 21 and 49 years, and in this group, the highest proportion (32.8%) was in the 30-39 years age group. The majority (62.3%) was married, with 33.9% being single. Almost all participants were Saudi Arabians, with only 4.2% being non-Saudi Arabian. Regarding education, 62% were college graduates, 15% were post-college graduates, and 20% were high school

graduates. Less than half (40%) reported a family income of 10,001-20,000 Saudi riyals per month, with 26.4% earning less than 10,000 Saudi riyals. Half of the sample indicated that they had to pay when visiting an ED or consulting a doctor. Less than half (40%) reported that they use governmental hospitals, while 47% used private hospitals. The prevalence of comorbidities or chronic diseases in the sample was 30.8%, with lung diseases, hypertension, and diabetes mellitus reported most frequently. Only 22% were current smokers.

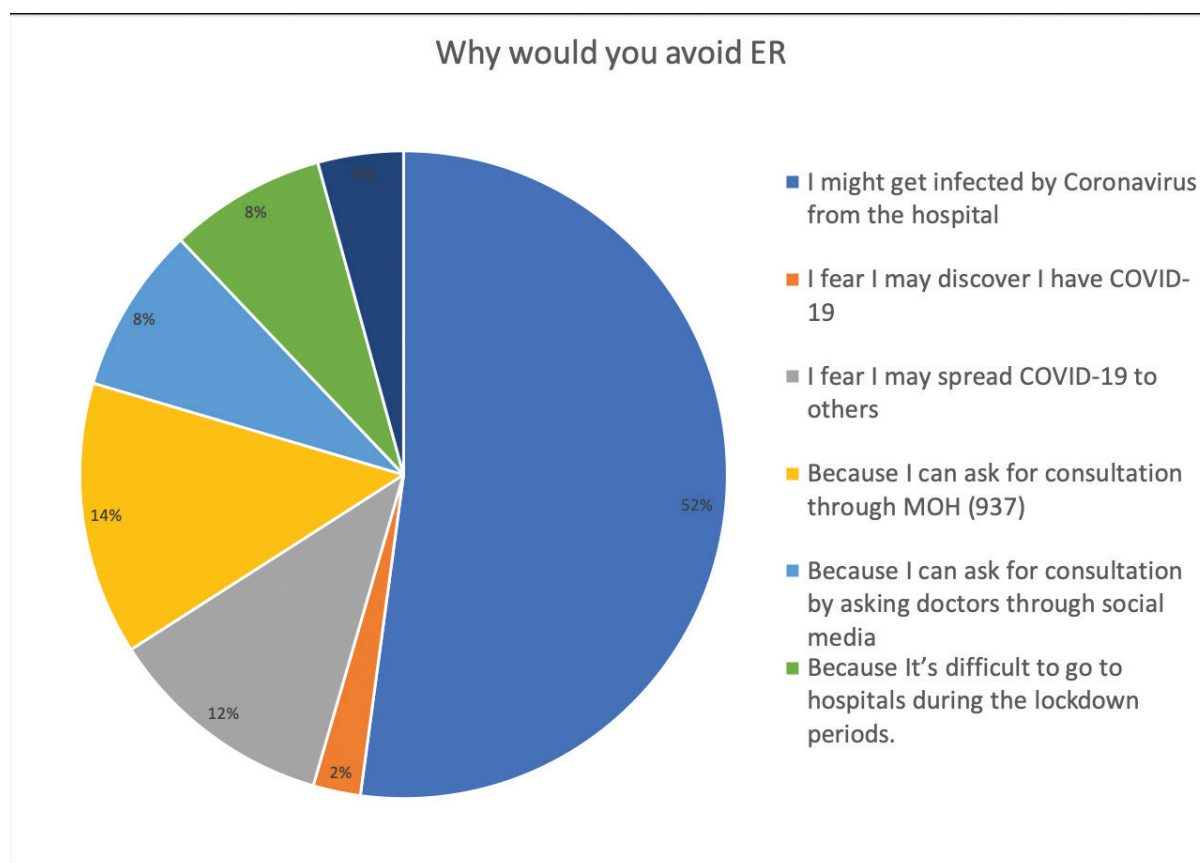
Forty-four percent ($n = 561$) of the participants have delayed or avoided medical care due to concerns about contracting COVID-19. Gender, age, and marital status were significantly associated with delaying or avoiding medical care ($p < 0.0001$). Participants who paid when visiting an ED or consulting a doctor had a significant association with delaying or avoiding medical care ($p < 0.0001$). The presence of comorbidities was also

significantly associated with delaying or avoiding medical care ($p < 0.0001$), but smoking was not.

More than half (58%) indicated at least one visit to an ED during the past year before the COVID-19 pandemic. Almost half (40%) reported being very anxious about visiting an ED to receive medical care during the COVID-19 pandemic, 43% being somewhat anxious, and only 16% were not anxious at all. The number of ED visits and anxiousness about visiting an ED was significantly associated with delaying medical care ($p < 0.0001$). The most frequent reason to avoid ED visit, chosen by 52% of the participants, was the fear of being infected at the hospital (Figure 1). If visiting an ED was unavoidable, 55% indicated that they would wait to confirm the emergency and almost 24% would delay an ED visit as much as possible. Half (50%) reported that the pandemic changed their behavior and only 26% thought that ED avoidance would actually impact their health.

Table 1. Sample characteristics and their association with delaying or avoiding medical care.

		During the COVID-19 pandemic, have you delayed or avoided seeking medical care due to concerns about contracting coronavirus (COVID-19)?				p Value
		Yes		NO		
		N	%	N	%	
Total population		561	44.0	714	56.0	N/A
Age	18-20	35	35.0	65	65.0	< 0.0001
	21-29	111	36.9	190	63.1	
	30-39	181	43.3	237	56.7	
	40-49	152	55.7	121	44.3	
	50-59	63	46.7	72	53.3	
	60-69	15	37.5	25	62.5	
	70 and more	4	50.0	4	50.0	
Gender	Female	320	51.2	305	48.8	< 0.0001
	Male	241	37.1	409	62.9	
Marital Status	Single	150	34.7	282	65.3	< 0.0001
	Married	383	48.2	411	51.8	
	Divorced	20	57.1	15	42.9	
	Widowed	8	57.1	6	42.9	
Do you pay when you visit an ER or see a doctor?	Yes	291	47.2	325	52.8	0.024
	No	270	41.0	389	59.0	
Do you have any comorbidities / chronic diseases	None	351	39.8	531	60.2	< 0.0001
	Yes	210	53.4	183	46.6	
Do you smoke:	Yes	113	39.2	175	60.8	0.115
	I quit	22	39.3	34	60.7	
	No	426	45.8	505	54.2	
During the past year, or before the COVID-19 pandemic, how many times did you visit the ED to get care for yourself?	None	207	38.5	331	61.5	< 0.0001
	1 time	111	39.2	172	60.8	
	2 times	94	48.2	101	51.8	
	3 times	68	55.3	55	44.7	
	4 times	37	57.8	27	42.2	
	5-9 times	35	63.6	20	36.4	
	10 times or more	9	52.9	8	47.1	
To what extent are you anxious about visiting the ED to receive the necessary medical care during COVID-19 pandemic?	Very anxious	339	65.6	178	34.4	< 0.0001
	Somewhat anxious	187	33.8	366	66.2	
	Not anxious	35	17.1	170	82.9	



Tables 2 and 3 show the consequences and complications associated with delaying or avoiding medical care. As a consequence of the COVID-19 pandemic, 40.4% indicated that they had to cancel or miss a scheduled medical appointment and a small proportion (7.7%) could not get a refill of their medication. In terms of the sample's perception of the importance of their appointment or medication, those who delayed or avoided medical care answered yes to "have you delayed or avoided seeking medical care due to concerns about contracting coronavirus" and 74.5% and 66.9% considered it very and somewhat important, respectively, compared to those who did not delayed or avoid medical care, i.e., those who answered no to the question.

The participants who responded "yes" to "have you delayed or avoided seeking medical care due to concerns about contracting coronavirus (COVID-19)?" and/or "have you, or any of your family members, had a medical condition that necessitates visiting the ED?" were asked whether they or a family member went to an ED to seek assistance for this condition. Just more than half (52.2%) responded that they did and 53% believed that their condition was emergent. A small proportion (18%) of the group that visited the ED experienced difficulties during their visit, and 11% developed a medical complication due to avoiding EDs when they should have gone. The complications led to additional consequences, including worsening of the disease or severity of pain (42.7%), being emotionally distressed because of the complications (31.5%), an increase in the cost (19%), and a more complicated treatment plan (14.6%).

Table 4 displays the multinomial logistic regression model for delaying or avoiding medical care by the level of anxiousness and the type of reaction to having a condition. Model 1 presents the crude (unadjusted) odds ratio, while model 2 was adjusted for the level of anxiousness and the type of reaction to having a condition. Significant p-values (< 0.0001) are found in both models. In model 1, being very anxious predicts an increase of 9.25 times (95% CI: 6.16-13.89) in the likelihood of delaying or avoiding medical care (p -value = < 0.0001), while being somewhat anxious predicts an increase of 2.48 times (95% CI: 1.65-3.71; p -value = < 0.0001). The group that chose to wait and see if it was an emergency was 0.51 times (95% CI: 0.390-0.672) more likely to delay or avoid medical care. Slight changes are seen in model 2 in both variables.

Discussion

The study explored the tendency to avoid visiting EDs for clinical complaints during the COVID-19 pandemic in Saudi Arabia, the factors that affect patients' decisions, as well as the association between the level of anxiousness and the type of reaction if they had a condition and delayed or avoided medical care.

The results are summarized as (1) the prevalence of the tendency to avoid visiting EDs during the COVID-19 pandemic, even when considered necessary, was 44%; (2) there was a significant association between delaying medical care and fear of contracting the virus at the hospital, and (3) a strong significant association was

Table 2. Complications associated with delaying or avoiding medical care or visiting the ED department.

		During the COVID-19 pandemic, have you delayed or avoided seeking medical care due to concerns about contracting coronavirus (COVID-19)?				p-Value
		Yes		NO		
		N	%	N	%	
Since the start of the COVID-19 pandemic, have you faced any of these difficulties?	I had to cancel or miss an already scheduled medical appointment	298	65.2	159	34.8	< 0.0001
	I had to cancel or miss my medications because I could not get any more.	25	62.5	15	37.5	
	Both	39	67.2	19	32.8	
	None	199	27.6	521	72.4	
How important would you say your appointment/medications were?	Very important	120	74.5	41	25.5	< 0.0001
	Somewhat important	202	66.9	100	33.1	
	Not important	40	43.5	52	56.5	
During the COVID-19 pandemic, have you, or any of your family members, had a medical condition that necessitates visiting ER?	Yes	327	55.3	264	44.7	< 0.0001
	No	234	34.2	450	65.8	
Did you or a family member go to the ED to seek help for this condition?	Yes	214	49.7	217	50.3	< 0.0001
	No	347	88.1	47	11.9	
Do you think your condition was emergent?	Yes	237	53.6	205	46.4	< 0.0001
	No	198	88.8	25	11.2	
	I don't know	126	78.8	34	21.3	
Have you faced any difficulties while receiving the ED services during the COVID-19 pandemic?	Yes	55	67.9	26	32.1	< 0.0001
	No	159	45.4	191	54.6	
Have you experienced any medical complications due to avoiding visiting the ED when you needed to?	Yes	70	78.7	19	21.3	0.023
	No	491	66.7	245	33.3	

Table 3. : Consequences associated with delaying or avoiding medical care or visiting the ED department.

Have these complications led to any of the following		During the COVID-19 pandemic, have you delayed or avoided seeking medical care due to concerns about contracting coronavirus (COVID-19)?				p-Value
		Yes		No		
		N	%	N	%	
My treatment plan became complicated	No	57	75.0%	19	25.0%	0.042
	Yes	13	100.0%	0	0.0%	
I was emotionally distressed because of these complications	No	48	78.7%	13	21.3%	0.990
	Yes	22	78.6%	6	21.4%	
It costs me money more than usual because of these complications	No	57	79.2%	15	20.8%	0.807
	Yes	13	76.5%	4	23.5%	
My disease/pain became more severe	No	37	72.5%	14	27.5%	0.104
	Yes	33	86.8%	5	13.2%	
I was admitted to the hospital	No	63	82.9%	13	17.1%	0.018
	Yes	7	53.8%	6	46.2%	
I was admitted the hospital for a longer period	No	69	79.3%	18	20.7%	0.317
	Yes	1	50.0%	1	50.0%	
I needed an operation that I could've avoided	No	65	77.4%	19	22.6%	0.230
	Yes	5	100.0%	0	0.0%	
I needed more difficult operation could've been avoided	No	68	78.2%	19	21.8%	0.456
	Yes	2	100.0%	0	0.0%	
I had poor outcomes that could've been avoided	No	64	78.0%	18	22.0%	0.635
	Yes	6	85.7%	1	14.3%	
A complication that cannot be treated	No	67	77.9%	19	22.1%	0.359
	Yes	3	100.0%	0	0.0%	
Management could have been easier and may not become life-threatening if detected early	No	62	78.5%	17	21.5%	0.912
	Yes	8	80.0%	2	20.0%	

Table 4. Multinomial logistic regression model building for delaying or avoiding medical care by level of anxiousness and type of reaction if having a condition.

Model	Model 1 ^a OR (95% CI)	p Value	Model 2 ^b OR (95% CI)	p Value
To what extent are you anxious about visiting the ED to receive the necessary medical care* during the COVID-19 pandemic?				
Very anxious	9.25 (6.16-13.89)	<0.0001	8.44 (5.59-12.73)	<0.0001
Somewhat anxious	2.48 (1.65-3.71)	<0.0001	2.31 (1.53-3.48)	<0.0001
Not anxious	Ref.		Ref.	
In case you have a condition				
I will wait to see if it is emergency	0.512 (0.390-0.672)	<0.0001	0.542 (0.405-0.726)	<0.0001
I will go to ER immediately	0.334 (0.237-0.471)	<0.0001	0.421 (0.291-0.610)	<0.0001
I will delay ER visit as much as possible	Ref.		Ref.	

*The reference category is: No.

^aUnadjusted (crude) OR.

^bAdjusted for level of anxiousness and type of reaction if having a condition.

observed between the level of anxiousness and delaying or avoiding medical care: the very anxious group was more likely to avoid going to an ED than the somewhat anxious or not anxious groups.

A study from USA, which used data from several healthcare systems in five states, reported a decline in ED visits from 40% to 60% [17]. This decline rate is similar to that in the current study, which fits within the US study's range. This range, including our reported prevalence, can be explained by many factors such as age, gender, presence of comorbidities/chronic diseases, and level of anxiousness. All of these factors are significantly associated with delaying or avoiding medical care in the current study. Other non-significant reasons include the availability of the Ministry of Health's consultation number (937), asking for consultations from doctors through social media, fear of spreading COVID-19 to others, difficulty in going to hospital during the lockdown period, and fear of discovering that they have COVID-19. The US study reported factors such as fear of being exposed to coronavirus, extended waiting times, and a sense of civic responsibility to avoid using healthcare services that others may require. However, these factors were assumed rather than evidence-based.

The significant association identified between delaying care and patients' beliefs, type of reaction to their illness, and being uninsured or paying when visiting an ED is supported by Weissman et al. [18], who reported that the most frequent reason for delaying care was that the patient thought the problem would go away or was not serious and that the cost of care was an important reason for delaying care. In the current study, paying for visiting an ED or consulting a doctor and patients' reaction should they have a condition were significantly associated with delaying or avoiding medical care during COVID-19.

A study conducted in Italy, one of the first countries to be affected in Europe, in 2020 indicated a dramatic decrease in ED visits. They compared visits during February and March 2020 with those prior to the COVID-19 pandemic, and the decline rate was 66.7%, which is a bit higher than the current study. This can be attributed to how the visits'

rate was measured; measuring the rate using hospital data rather than the questionnaire can be more accurate.

In both studies in US and Italy, the decrease in ED visits was statistically significant in all age groups. In Italy, however, it was most evident in children less than 10 years of age. According to Atti et al. [19], the factors that contributed to the reduction in ED visits could be parents' fear of exposing their children to COVID-19 in the hospital setting, the probability that most conditions could be safely managed at home, and the availability of consulting physicians through phone or using telemedicine tools. In addition, social distancing decreased the risk of acquiring infectious diseases, causing a reduction in ED visits. It should be noted that these factors were assumed rather than based on evidence [19].

The current study has several strong points. The questionnaire was face validated and focused on the topic explored, providing evidence related to patients' avoidance of medical care and visiting EDs, rather than hypothesizing about the possible factors. The sample size ($n = 1,275$) was large enough to estimate the tendency to avoid EDs and to determine the association between the sub-variables and the main outcome.

Limitations of the study

A limitation of the current study is that the questionnaire was online-based and distributed through social media websites and applications, which could be a challenge in terms of delivering the questionnaire to all possible participants. However, using the online questionnaire was the preferred method to collect the data as the study was conducted in the middle of the COVID-19 crisis in Saudi Arabia and safety measures such as social distancing instructions had to be followed. The results of this study can be further supported by calculating the decline rate of ED visits before and during the COVID-19 pandemic using statistics from hospitals in Saudi Arabia.

Conclusion

The tendency to avoid EDs in the Saudi population is high and similar to international literature. There are

factors associated with this avoidance, including gender, age, marital status, paying when seeking care, presence of comorbidities, the number of visits, and notably, the level of anxiousness about visiting an ED during the pandemic. It is crucial to gain an in-depth understanding of these factors, their effect on avoidance, and the consequences to decrease the complications of avoiding medical care and EDs during a pandemic as the complications can be fatal. Researchers and higher authorities should pay special attention to vulnerable groups to prevent further complications. Patients need to be educated about the importance of visiting an ED at the appropriate timing when having serious illnesses during a pandemic. Efforts should also be made to decrease patients' level of anxiousness.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to Participate

Online written informed consent was obtained from all the participants.

Ethical approval

Ethical approval was granted by Unit of Biomedical Ethics, Institutional Review Board, King Abdullah International Medical Research Center, Ministry of National Guard-Health Affairs, Saudi Arabia, via reference: IRBC/1090/20 dated: 9th of July 2020.

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