



# Post-acute COVID-19 condition in Saudi Arabia: A national representative study

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## Background

Many survivors of COVID-19 have developed symptoms and diseases similar to those observed after severe acute respiratory syndrome (SARS). Therefore, this study aimed to characterize the symptoms that appear after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has been eradicated and to determine their relationship with COVID-19 severity.

### Aim

To investigate and characterize the post-acute COVID-19 condition and its relationship with the severity of the disease.

### Methods:

- This multicenter, retrospective cross-sectional study was conducted in all eligible confirmed cases of SARS-CoV-2 infection from Saudi Arabia.
- Study participants were randomly selected using computerized random sampling from a population of 314,821 patients.
- The study included all patients diagnosed with COVID-19 who were at least 18 years old.
- The study was excluded patients who died during acute illness and patients who refused to consent for participation and provide all requested information.
- Oral consents and interviews were obtained by phone through the “937” Ministry of Health call center.

## Results

- A total of 1000 participants with confirmed SARS-CoV-2 infection were included in the study
- A mean age of 36.9 ± 11.9 years.
- Most of the participants (85.9%) were < 50 years of age
- The male to female ratio was 1.5:1

	Ongoing symptomatic COVID-19 n=225			Post-COVID-19 syndrome n=92		
	Counts	% Total	% of Symptomatic	Counts	% Total	% of Symptomatic
Loss of smell	118	11.8	52.4	35	3.5	38
Loss of taste	70	7	31.1	15	1.5	16.3
Fatigue	26	2.6	11.5	7	0.7	7.6
Shortness of breath	23	2.3	10.2	5	0.5	5.4
Cough	20	2	8.9	2	0.2	2.2
Joint pain	19	1.9	8.4	4	0.4	4.3
Headache	11	1.1	4.9	3	0.3	3.3
Chest pain	11	1.1	4.9	3	0.3	3.3
Hair loss	9	0.9	4	1	0.1	1.1
Fever	5	0.5	2.2	5	0.5	5.4
Myalgia	5	0.5	2.2	1	0.1	1.1
Diarrhea	5	0.5	2.2	1	0.1	1.1
Sore throat	5	0.5	2.2	2	0.2	2.2
Low mood	4	0.4	1.8	2	0.2	2.2
Loss of appetite	3	0.3	1.3	1	0.1	1.1
Sputum	3	0.3	1.3	1	0.1	1.1
Nausea	2	0.2	0.9	1	0.1	1.1
Numbness	2	0.2	0.9	1	0.1	1.1
Anxiety	1	0.1	0.4	1	0.1	1.1
Chronic sinusitis	1	0.1	0.4	1	0.1	1.1
Nasal congestion	1	0.1	0.4	1	0.1	1.1
Dry eye	1	0.1	0.4	1	0.1	1.1
Tinnitus	1	0.1	0.4	1	0.1	1.1

Table1. The distribution of ongoing symptomatic COVID-19 and post-COVID-19 syndrome patients.

## Results

- Table 2 presented the Factors associated with the occurrence of COVID-19 symptoms beyond 4 weeks of
- Multivariate logistic regression analysis demonstrated the presence of acute symptoms of COVID-19 and hospital admission were significant independent predictors of post-COVID-19 condition (aOR= 15.0, 95% CI 2.1–109.4; p = 0.008 and aOR= 2.3, 95% CI 1.3–3.9), p = 0.002),

	Univariate analysis		Multivariate analysis	
	Mean.Dif/ Unadjusted OR (95%CI)	P-value	Adjusted OR	P-value
Age-years	0.91 (0.86–2.67)	0.442	0.99 (0.9–1.0)	0.08
Male sex	Reference			
Female sex	1.4 (1.03–1.87)	0.034*	1.3 (0.98,–1.98)	0.157
Occupation				
Not working	Reference			
Employed	0.79 (0.57–1.1)	0.17	0.92 (0.6–1.4)	0.688
Healthcare	0.81 (0.39–1.6)	0.55	0.93 (0.4–1.8)	0.648
Retired	0.79 (0.42–1.5)	0.48	1.1 (0.5–2.4)	0.799
Student	2.1 (0.9–5.0)	0.080	1.8 (0.7–4.5)	0.191
Smoking				
Current	Reference			
Never	1.3 (0.85–1.9)	0.76		
Past	1.4 (0.76–2.6)	0.255		
Comorbidity				
No comorbidity	Reference			
1	1.4 (0.95–2.1)	0.088	1.3 (0.8–1.8)	0.215
≥2	1.1 (0.7–1.9)	0.61	0.7 (0.2–2.4)	0.645
Presence of acute symptoms	6.8 (2.5–18.8)	<0.0001*	6.5 (2.3–18.04)	0.0001*
Fhx of similar symptom	0.69 (0.28–1.69)	0.412		
Hospital admission	2.33 (1.4–4.0)	0.001*	2.4 (1.3–4.2)	0.002*
Length of stay	0.77 (-5.2–3.6)	0.730		

### Conclusion:

Saudi patients with COVID-19 develop a wide range of symptoms, similar to those observed and reported in other countries.

The loss of smell, the loss of taste, shortness of breath, and fatigue were the main persistent symptoms.

- Regular follow-up of COVID-19 survivors is highly recommended