Ann Ig. 2022 Sep-Oct; 34(5): 478-489 doi: 10.7416/ai.2022.2508

A cross-sectional analysis of post-acute COVID-19 symptoms

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Keywords: SARS CoV-2, Post-COVID-19 syndrome, Persistent symptoms, Organ dysfunction
Parole chiave: SARS CoV-2, Sindrome Post-COVID-19, Sintomi persistenti, Disfunzione d'organo

Abstract

Objectives. *The severe acute respiratory syndrome (COVID-19) due to SARS-CoV-2 was first reported in China in December 2019 and has generated a worldwide pandemic. The objective of the research is to examine and describe (a) the symptoms that persist after the end of the acute stage and (b) their relationship with the severity of the disease.*
Study Design. *This study is a cross-sectional study conducted in the Kingdom of Bahrain on COVID-19 infected patients using an online survey questionnaire with a total number of 52 patient responses (29 females and 23 males).*
Method. *A scale (0 no symptoms to 10 very high symptoms intensity) was assessed in patients after 3 months to detect the relevance of specific symptoms post-COVID-19 such as emotional and physical health, headache, dyspnoea, pain (muscles/joints/chest), anosmia, vertigo, neurologic symptoms, sarcopenia, delirium.*
Results. *The most common COVID-19 symptoms were reported to be fever (69.2%), headache (59.6%), and cough (50.0%). Data analysis showed that BMI was not correlated with any post-acute COVID-19 symptoms. Regarding the post-acute COVID-19 symptoms, this study showed that an increase of intensity of*

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Annali di Igiene : Medicina Preventiva e di Comunità (Ann Ig)
ISSN 1120-9135 https://www.annali-igiene.it

headache was associated with an increase of delirium; an increase of intensity of dyspnoea was associated with an increase of pulmonary dysfunction. The increase of anosmia and dysgeusia was associated with an increase in delirium. In addition, the increase of neurological symptoms and delirium were associated with the increase of sarcopenia. The most common persistent post-COVID-19 symptoms observed in this study were emotional stress, followed by loss of smell and taste, and neurological symptoms.

Conclusions. *Therefore, follow-up and rehabilitation care for COVID-19 patients must be focused on addressing the needs of these people in the longer term.*

Introduction

The coronavirus disease 2019 (COVID-19) first manifested itself in December 2019 in Wuhan, China, as an epidemic (1). Soon after few months, on 11th March 2020, the World Health Organization (WHO) declared COVID-19 as a worldwide pandemic (2). The number of confirmed cases of COVID-19 continues to rise every day. Many studies have been conducted to clarify the epidemiology, virology, and clinical management of Covid-19. Researchers have not identified or approved any specific drug against SARS-CoV-2, due to a lack of sufficient data evidence and understanding (1). Affected patients suffer from physical, respiratory, and psychological dysfunction. As it is a highly contagious respiratory disease, infected subjects - and not only patients - must be isolated, to restrict the spread of SARS-CoV-2, resulting in a considerable reduction in social interactions (1).

Coronaviruses belong to the order of Nidovirales, family Coronaviridae. They are named Corona due to their structure, which includes crest-type spikes on the outer surface. The size of SARS-CoV-2 ranges from 65 to 125 nm and its genetic material is an enveloped single-stranded RNA (3). SARS-CoV-2 infected patients could be either asymptomatic or may suffer moderate to serious clinical symptoms such as pneumonia, respiratory failure, and death in severe cases. Fever, cough (with/without expectoration), body aches and/or weakness, dyspnoea, headache, sore throat, and gastrointestinal symptoms are some of the most common symptoms in patients (4, 5).

In contrast to the throat, studies demonstrated higher infection rates in the nasal cavity with no variation in viral strain between symptomatic and asymptomatic patients (6). In favourable environmental conditions, the virus will remain alive on surfaces for days but can be killed easily by common disinfectants, such as sodium hypochlorite, hydrogen peroxide, etc. Transmission of infection is either by inhaling or touching the areas or surfaces that are contaminated by these droplets and also if the nose, mouth, and eyes come in contact (7).

Previous coronavirus outbreaks of an extreme acute respiratory syndrome (SARS) in 2002 and the Middle East respiratory syndrome (MERS) in 2012 resulted in reduced lung function and exercise capacity, post-traumatic stress disorder (PTSD), depression and anxiety, and reduced quality of life were observed in survivors. Hence, post-discharge symptoms for COVID-19 can also be expected to be similar (2). Recent studies have also begun to identify chronic effects that continue past the initial illness or hospitalization period. The medium and long-term problems experienced by survivors of COVID-19 after discharge from the hospital are called "post-acute COVID-19 symptoms" (8). A study by Halpin et al. reported that fatigue, breathlessness, and joint pain are some of the post-acute symptoms in COVID-19 survivors (2).

The post-acute COVID-19 medical literature accounts for subjective post-acute effects in patients that recovered from a wide range of acute COVID-19 infections, from asymptomatic infection to severe

illness. Post-acute manifestations can be categorized into 3 groups to standardize our current definition of post-acute COVID-19: (1) residual symptoms that continue after recovery from acute infection; (2) organ dysfunction that persists after initial recovery; and (3) new symptoms or syndromes that arise after initial asymptomatic or mild infection (8). The various effects of acute COVID-19 on multiple organ systems have been well-described along with symptomatology. Beyond the acute process, the persistence of organ dysfunction is also being reported. The objective of the present research is to examine and describe the symptoms that persist after a coronavirus infection has gone to an end and its relationship to the severity of the disease. In addition, our aim was to study the impact of post-acute COVID-19 symptoms on patients by characterizing the frequency and persistence of symptoms associated with hospitalization post-COVID-19 infection.

Methodology (Study design)

Setting and Participants

We collected data from people 18 years of age and older, who suffered from COVID-19 and had been hospitalized in the Kingdom of Bahrein between April and June 2020. All patients tested negative for SARS-CoV-2 and met the World Health Organization criteria for quarantine discontinuation.

1. Data collection

Patients were asked to retrospectively recount the presence or absence of symptoms during the acute phase of COVID-19 and whether each symptom persisted at the time of the visit. More than 1 symptom could be reported. The EuroQol visual analog scale was used to ask patients to score their quality of life from 0 (worst imaginable health) to 100 (best imaginable health) before COVID-19 and at the time of the visit. A reduction of 10 points defined the worsened quality of life.

This was a cross-sectional study performed using an online survey questionnaire to report post-COVID-19 symptoms of people living in Bahrain. The questionnaire, proposed and already validated in Italy by Carfi et al. (9), included multiple-choice questions and checkbox questions. The questionnaire was distributed among the people of Bahrain via different social media platforms. The inclusion criteria were: all patients (from 18 years to 65 years old) living in Bahrain and having suffered from hospital-diagnosed COVID-19. Firstly, they were asked to report clinical and pharmacological records, lifestyle factors, vaccine status, and body measurements. Secondly, they were asked to report any underlying medical conditions, the number of days they were hospitalized for COVID-19, and symptoms when they tested positive. Finally, patients were asked to report the presence or absence of symptoms during the acute phase of COVID-19 and whether each symptom persisted after the recovery from COVID-19, respectively. It was made possible to report more than one symptom. Patients were asked to rate their quality of life from 0 (low level of suffering) to 10 (high level of suffering), using a Likert scale. Patient information was stored securely and accessed via Google forms and the final responses database w downloaded for data analysis. This prospective follow-up epidemiological research was carried out from 6 November to 2 December 2020.

2. Data analysis

Data analysis was carried out using MS Excel and descriptive statistics tool to compare characteristics among respondents who reported returning and not returning to their usual state of health. Frequency analyses (% ages) for categorical variables and mean (+/- standard deviation) for quantitative variables were used in the descriptive statistics. Analyses were performed by

SPSS version 25.0 software, where the statistically significant value was $p < 0.05$ and all tests were two-sided. Jamovi app and cran is the package for statistical analysis and data visualization of the graphs. R was used for the graphical representation of the database.

Table 1 - Demographic data prevalence of variable characteristics of outpatients with SARS--22

Variable		Prevalence (%)
Gender	Male (n. 29)	44.2 %
	Female (n. 23)	55.8 %
Age	18-24	38.4 %
	25-34	21.2 %
	35-44	17.3 %
	45-54	7.7 %
	55-64	1.9 %
	under 18	13.5 %
Employment status	Employed	44.2 %
	Student	46.2 %
	Unemployed	9.6 %
Marital status	Married	44.2 %
	Separated	1.9 %
	Single	53.8 %
Nationality	Bahraini	50.0 %
	Non-Bahraini	50.0 %
Pre-existing medical conditions	Healthy	76.9%
	Cardiovascular	3.8%
	Diabetes	5.8%
	Hypercholesterolemia	7.7%
	Diabetes and Hypercholesterolemia	1.9%
Hospitalized	Yes	44.2%
	No	55.8%
Hospitalization period	10-20 days	9.6 %
	less than 10 days	40.4 %
COVID-19 symptoms	Fever	69.2 %
	Cough	50.0 %
	Headache	59.6 %
	Nausea	30.8 %
	Anosmia	53.8 %
	Dyspnoea	13.5 %
	Dysgeusia	48.1 %
	Myalgia	42.3 %
	Fatigue	36.5 %
	Diarrhoea	19.2 %
New symptoms during hospitalization	Sore throat	11.5 %
	Chills	9.6 %
	Stomach ache	15.4 %
	Coughing	15.4 %
	Pneumonia	5.8 %
Worsening of symptoms	Agree	17.3 %
	Disagree	57.7 %
	Neither agree nor disagree	25.0 %
Medications for post- acute symptoms	Yes	30.8 %
	No	69.2 %

Table 2 - Inference analysis based on gender for hospitalization and medications

Variable	Female	Male	P value
Hospitalized for COVID-19	55.2%	30.4%	0.074
Hospitalization period			
<10 days	71.4%	28.6%	0.168
10-20 days	40.0%	60.0%	
Medications for Post-COVID 19 symptoms	75%	25%	0.063

Results

1. Demographical Characteristics

The demographical data of the 52 participants included more females (55.8%) than males (44.2%). The most represented age group was 18-24 years with a 38.5 % prevalence, and the least affected age group was 55-64 years with a 1.9% prevalence. Students were the most represented (46.2%), while unemployed individuals were the least represented (9.6%). Bahrainis (50%) and non-Bahrainis (50%) were equally represented (Table 1). The distribution was possibly influenced by the non-uniform familiarity of the different categories with the online questionnaires.

2. During COVID-19 infection

A percentage of 23.1 % of the patients has at least one comorbid condition and 76.9 % of patients were healthy pre-COVID-19. Out of the total patient population, only 44.2 % of patients with COVID-19 have been hospitalized. In 40.4 % of patients, the hospitalization period was less than 10 days. The average number of symptoms were 10 in the interview survey, with fever (69.2 %), fatigue (36.5 %), cough (50 %), headache (59.6 %), nausea (30.8 %), diarrhoea (19.2 %), anosmia (53.8 %), dyspnoea (13.5 %), dysgeusia (48.1 %), and myalgia (48.1 %), among the 52 symptomatic outpatients (42.3 %). During their hospitalization, few patients have experienced new symptoms, such as sore throat (11.5 %), chills (9.6 %), stomach pain (15.4 %), coughing (15.4 %), pneumonia (5.8 %). More than half of the patients agreed that their symptoms worsened (57.5 %), while 80.8 % of patients took immunity medications during COVID-19 (Table 1).

3. Inference analysis based on gender for hospitalization and medications

According to Table 2, the majority of females (55.2%) were hospitalized, whereas only 30.4% of males were hospitalized after testing positive for COVID-19 (P-value = 0.074). The hospitalization period of <10 days was more common for females (71.4%) and that of 10-20 days was more common for males (60%), with a p-value of 0.168. Among gender, most females (75%) depended on medications and only 25% of males depended on medications for post-COVID-19 symptoms (Table 2).

4. Nationality and hospitalization

According to Table 3, hospitalization after testing positive for COVID-19 was more common for Bahrainis (73.9%), whereas only 26.1% was represented by Non-Bahraini (P-value = 0.0021). The hospitalization period of <10 days was mostly represented by Bahrainis (81.0%:p value = 0.0021) and also that of 10-20 days (60%). Among the 2 groups, mostly Bahrainis (68.8 %) were offered medications post-COVID-19 symptoms (Table 3).

Table 3 – Nationality effect for hospitalization and medications

	Non-Bahraini	Bahraini	P value
Hospitalized for COVID-19	26.1%	73.9%	**0.0021**
Hospitalization period			
<10 days	19.0%	81.0%	**0.0001**
10-20 days	40.0%	60.0%	
Medications for Post-COVID 19 symptoms	31.3%	68.8%	0.071

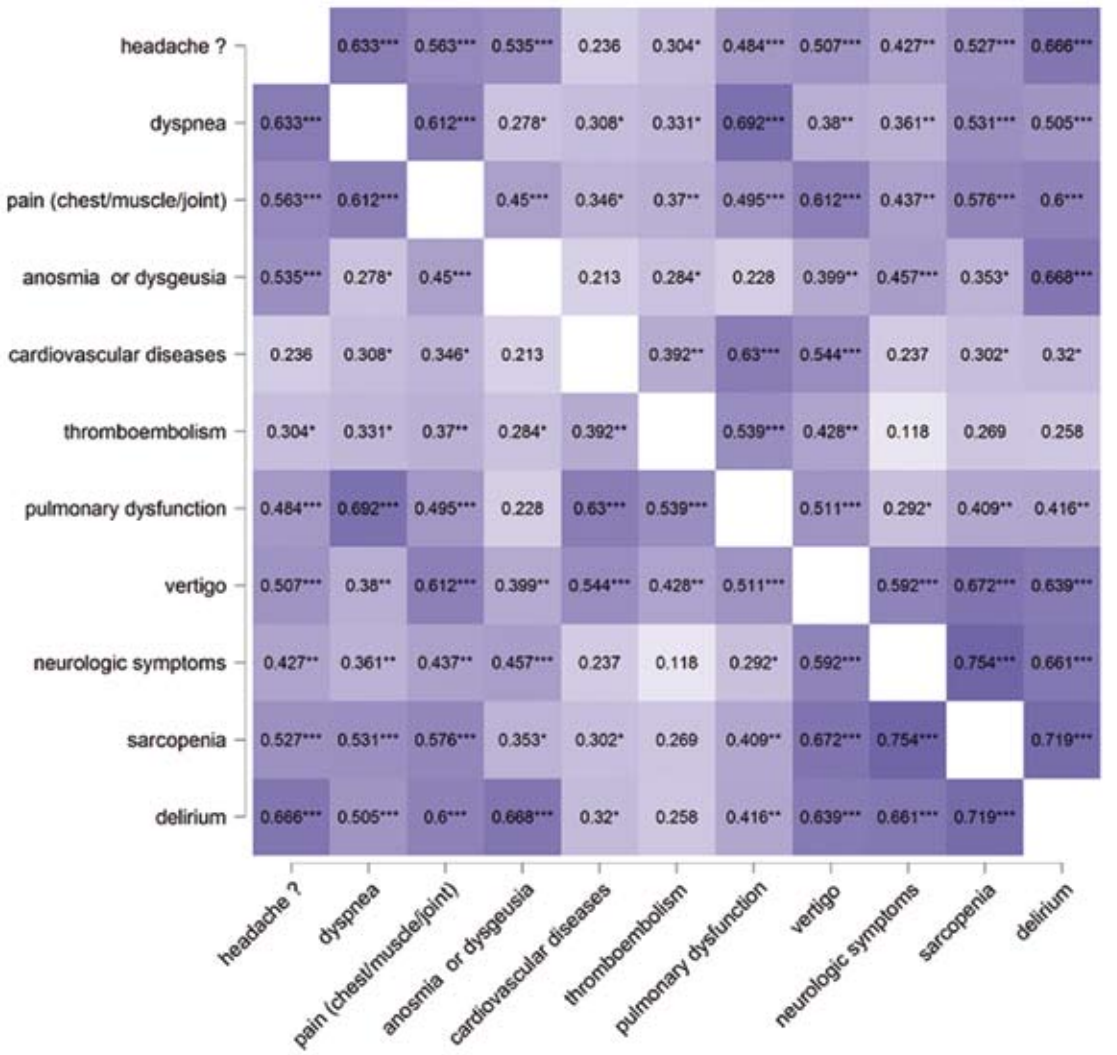

Figure 1 – Correlations Heatmap of Post-acute COVID-19 symptoms: the figure shows the correlation between the intensity of the main symptoms recorded in post-COVID-19 patients.

Table 4 – Correlations between BMI and Post-acute COVID-19 symptoms.

Factors associated with BMI	r (spearman)
headache	0.03
dyspnea	0.061
pain (chest/muscle/joint)	-0.045
anosmia or dysgeusia	0.039
cardiovascular diseases	0.093
thromboembolism	-0.048
pulmonary dysfunction	0.092
vertigo	0.031
neurologic symptoms	0.086
sarcopenia	-0.073
delirium	-0.061

**p-value <0.05

Table 4 shows that BMI was not correlated with any Post-acute COVID-19 symptoms. An increase in BMI seemed instead to be associated with the increase of intensity of neurologic symptoms (r=0.086) and cardiovascular diseases (r=0.093), but no statistically significant p value was recorded.

Figure 1 shows the association between levels of post-COVID-19 symptoms intensity. The increase of intensity of headache was associated with an increase of delirium (r=0.666), while the increase of intensity of dyspnea was associated with an increase of pulmonary dysfunction (r=0.692). Moreover, the increase of anosmia and dysgeusia was associated with the increase of delirium (r=0.668). In addition, the increase of neurological symptoms and delirium was associated with the increase of sarcopenia (r=0.700).

Figure 2 shows the network analysis based on the main interactions between the main investigated outcomes: BMI was linked with pain, thromboembolism, and cardiovascular diseases. Sarcopenia was linked with delirium and neurological symptoms.

Table 5 shows the means (in the level of suffering based on 10 points) of the most common persistent symptoms post-COVID-19 reported. The highest level of suffering was recorded on emotional stress (7.42/10), followed by loss of smell and taste (4.54/10) and neurological symptoms (3.31/10).

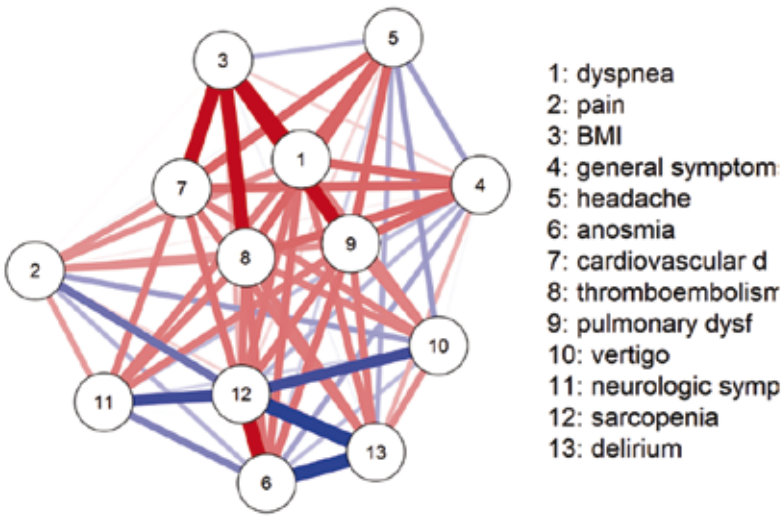

Figure 2 – Network analysis on post-acute-COVID-19 symptoms.

Table 5 – Mean and standard deviation of the intensity of most common persistent symptoms post-COVID-19

	Mean (based on 10)	Std. Deviation
Emotional stress	7.42	2.363
Headache	3.69	3.843
Dyspnoea	2.19	2.911
Pain	3.21	3.669
Smell/taste loss	4.54	3.791
Cardiovascular diseases	1.87	2.179
Thrombo-embolism	1.87	2.142
Pulmonary dysfunction	1.27	2.426
Vertigo	2.46	3.019
Neurological symptoms	3.31	3.617
Sarcopenia	2.81	3.565
Delirium or restlessness	3.15	3.616

Discussion

This is the first study in Bahrain about the post-acute COVID-19 infection symptoms. The current study investigates the subjective post-acute effects in patients residing in the Kingdom of Bahrain that have recovered from a wide range of acute COVID-19 infection.

Based on the results of this study, the most common symptoms of COVID-19 were fever (69.2%), headache (59.6%), and coughing (50.0%). In a recent study by Nascimento et al., fever, cough (with/without sputum), body aches and/or weakness, dyspnoea, headache, sore throat, and gastrointestinal symptoms were some of the most common symptoms of COVID-19 in patients (5). Based on the observations of the current study, one of the most common recurring post-COVID-19 symptoms was headache. Patients suffering from chronic headaches post-COVID-19 infection were also recorded in a study by Carvalho-Schneider et al. and Del Rio et al. (10, 11). Headache may be triggered by elevated stress that causes attacks of migraine and leads to worsening situations of delirium. Viral infections are also observed to induce the primary headache (12). A study by del Rio et al. indicated that low emotional and physical well-being may be due to the stigma associated with COVID-19, which is now widespread and may lead to a sense of hopelessness (11). Increasing cases of residual malaise and exhaustion-like chronic fatigue syndrome will leave patients with physical weakness and emotional distress. We can also suggest that, due to the presence of persisting post COVID-19 symptoms, overall physical and emotional health deteriorated among patients. Sarcopenia was observed to show a positive correlation with neurologic symptoms and delirium, suggesting neurologic symptoms had an impact on loss of muscle mass and strength, which could be due to loss of appetite or poor diet. Sarcopenia was reported in many patients in a post-COVID-19 study by Amenta et al. (8) and Del Rio et al. (11). Also, symptoms of increased stress concerning COVID-19 news were linked with neurological symptoms, sarcopenia, and delirium, all these symptoms were positively correlated with each other. Although other symptoms have shown weak associations, but due to lack of information further research is required to study the association or correlations between symptoms.

Pain was recorded among Bahrain's most frequently observed COVID-19 persistent manifestations. A study by Del Rio et al. (11) and Kamal M et al. (13) reported chest and joint pain in several patients. According to these reports, most of the observed post-COVID-19 symptoms were mild reversible manifestations that were also categorized as mild manifestations that could be relieved without medical interventions such as joint and muscle pain (14).

Cardiovascular diseases (myocarditis - inflammation of the heart muscle) were not

reported to be very common among patients, only 23.1 % reported having cardiovascular dysfunction. A study by Amenta et al. (8) and del Rio et al. (11) reported patients with myocardial injury: it was characterized by enhanced troponin levels, which have been reported in patients with severe acute COVID-19 along with thromboembolic disease, irrespective of pre-existing conditions. Myocardial inflammation, myocarditis, and cardiac arrhythmias have been reported post-infection with SARS-CoV-2.

A percentage of 21% of patients reported suffering from thromboembolism. We may conclude that thromboembolism was not widespread among patients but was reported as a chronic post-COVID-19 symptom in a few cases. A study by Amenta et al. (8), and Greenhalgh et al. (15) reported an increased risk of venous thromboembolism (VTE) is associated with acute SARS-CoV-2 infection, especially in its extreme form. Based on current understanding, the long-term risk of VTE is less well known. COVID-19 is an infectious and hyper-coagulatory condition, with an elevated risk of thromboembolic events. Prophylactic anticoagulation is given to certain patients to overcome thromboembolism.

Pulmonary dysfunctions (lung function abnormalities) post-COVID-19 infection was reported in 30.8% of patients. Thus, pulmonary dysfunction is also not widespread among patients but was reported in some patients. A study by Amenta et al. (8) and del Rio et al. (11) also reported patients suffering from pulmonary dysfunction. Patients had radiological abnormalities consistent with pulmonary dysfunction, such as interstitial thickening and fibrosis, and had chronic symptoms. The patients had reduced carbon monoxide diffusion ability and weakened the strength of the respiratory muscle. If compounded with either pre-existing or occurrence of cardiovascular comorbidities from COVID-19, a persistent reduction in lung function may have significant adverse cardiopulmonary implications (11).

According to the network analysis based on the main interactions between the main investigated outcomes, it was found that pain, thromboembolism, and cardiovascular diseases were strongly linked with the BMI (16). In addition, sarcopenia was linked with delirium and neurological symptoms. Nevertheless, our data showed that BMI was not correlated with any post-acute COVID-19 symptoms. The increase of BMI could be associated with the increase of the intensity of neurologic symptoms and cardiovascular diseases; however, this association is not statistically significant. Nonetheless, obesity can influence immune function and induce systemic inflammation, as well as an increase of the cardiovascular load and risk of metabolic diseases. Obesity can affect the status of immune function and increase the risk of severe COVID-19 and it has already been reported that obesity can increase the risk of severe COVID-19 (17). Research by Kamal et al. (13) indicated similar findings on obesity as a factor affecting the severity of disease or symptoms of post-COVID-19, but the results showed that most participants were overweight or obese, without achieving a significant impact on the severity level or category of post-COVID-19 symptoms. Hence, from our results, we can conclude that BMI does not impact post-COVID-19 symptoms and does not determine its severity.

Interference analysis was conducted to study the correlation between gender and hospitalization. Based on the findings, no significant correlation was noted between gender and hospitalization for COVID-19, hospitalization period, and medications for post-COVID-19 symptoms. Nevertheless, this outcome may also be attributed to the fact that more women were infected than men in this study. In a study by Killerby et al. (18), most males were hospitalized and reported having milder conditions, in non-hospitalized patients vary from

hospitalized patients. Hospitalization status in this analysis does not just indicate disease seriousness, but also treatment-seeking and likely other confounding characteristics (18). A study by Kopel et al. (19) reported that due to the presence of a more robust immune system, women are less vulnerable to viral infections than men. In female immune systems, hyperactive reactions to viral infections may increase the severity of symptoms and pathological effects that has been observed in male patients, resulting in increased development of cytokines, chemokines, and interferons in women than in men. Females sustain strong immune responses after the removal of the viral infection, which may raise the risk of post-infection complications relative to men. In consideration of these differences in viral symptoms, COVID-19 infected female patients can suffer longer term complications than males, suggesting females suffered from greater severity of symptoms after a COVID-19 infection than males and hence were relying on medications to ease the suffering (20).

Overall, about 64 % of patients' emotional disturbance and behavioural changes (feeling of loneliness, hopelessness, etc.) were observed as a post-COVID-19. Thus, we can conclude that most of the patients in Bahrain suffered from emotional disturbance and behavioural changes due to feelings of loneliness and hopelessness due to post-COVID-19 infection. The stigma associated with COVID-19 has now been prevalent and can contribute to a feeling of hopelessness. Increasing records of chronic fatigue syndrome-like residual malaise and exhaustion can leave patients with physical weakness and emotional disturbance. Compounded by the neurological toll of the pandemic, people suffering from COVID-19 could be at an even higher risk of depression, anxiety, posttraumatic stress disorder (11).

Conclusions

To conclude, this study emphasized the presence of multiple symptoms in hospitalized and non-hospitalized patients with confirmed or suspected COVID-19 infection residing in Bahrain. The available information indicates that a subset of patients recovered from acute SARS-CoV-2 infection undergoes prolonged disease complications associated with chronic symptomatology or prolonged organ dysfunction, following initial asymptomatic or moderate infection. BMI was not statistically associated with any symptoms post-COVID-19. The most dominant among these persisting symptoms post-COVID-19 were worst emotional and physical health (98.1%), headache (63.5%), dyspnoea (50%), pain (muscle /joint/chest 61.5%), anosmia (50%), vertigo (55.8%), neurologic symptoms (61.5%), sarcopenia (50%), delirium (61.5%), increased stress regarding COVID-19 news (51.9%), emotional and behavioural disturbances (63.5%) in patients of Bahrain. In many participants of Bahrain, there was a clinically significant drop in the quality of life. Therefore, follow-up and rehabilitation care for COVID-19 patients must be focused on addressing the needs of these people for the longer term.

Funding: None.
Competing interests: None declared.
Ethical approval: Not required as the study did not involve secondary datasets containing personal or identifiable data.

Riassunto

Analisi trasversale dei sintomi della COVID-19 post-acuta

Obiettivo. La sindrome respiratoria acuta severa dovuta all'infezione da coronavirus 2 (SARS-CoV-2) è stata segnalata per la prima volta in Cina nel dicembre 2019 fino a diventare una pandemia. Lo scopo del presente studio è stato quello di esaminare e descrivere i sintomi

che persistono dopo la guarigione dall'infezione da coronavirus e la loro relazione con la gravità della malattia.

Disegno dello studio. È stato condotto uno studio trasversale nel Regno del Bahrein in 52 pazienti (29 femmine e 23 maschi) con infezione da COVID-19, a cui è stato somministrato un questionario di indagine online.

Metodi. Per indagare la rilevanza di sintomi specifici post-COVID-19, i pazienti hanno compilato una scala di valutazione (da 0, "nessun sintomo", a 10, "intensità dei sintomi molto alta") dopo 3 mesi dalla malattia; i sintomi riguardavano salute emotiva e fisica, mal di testa, dispnea, dolore (muscolare, articolare, toracico), anosmia, vertigini, sintomi neurologici, sarcopenia e delirio.

Risultati. I sintomi del COVID-19 maggiormente segnalati erano febbre (69,2%), mal di testa (59,6%) e tosse (50,0%). L'analisi dei dati ha mostrato che il BMI non era correlato con alcun sintomo acuto post-COVID-19. Nello specifico, per quanto riguarda i sintomi post-COVID-19, il presente studio ha mostrato che un aumento dell'intensità del mal di testa era associato all'aumento del delirio, mentre un aumento dell'intensità della dispnea era associato all'aumento della disfunzione polmonare. L'aumento dell'anosmia e della disgeusia è stato associato ad un aumento del delirio. Inoltre, all'aumentare dei sintomi neurologici e del delirio si associava l'incremento della sarcopenia. I sintomi persistenti post-COVID-19 più comuni osservati in questo studio sono stati lo stress emotivo, seguito dalla perdita dell'olfatto e del gusto e dai sintomi neurologici.

Conclusioni. Il follow-up e l'assistenza riabilitativa per i pazienti che hanno contratto il COVID-19 dovrebbe focalizzarsi sull'affrontare le esigenze di queste persone nel lungo termine.

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