

Post-COVID-19 syndrome among healthcare workers in Jordan

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Abstract

Background: Post-COVID-19 syndrome covers a wide range of new, recurring or ongoing health conditions, which can occur in anyone who has recovered from COVID-19. The condition may affect multiple systems and organs.

Aims: To evaluate the frequency and nature of persistent COVID-19 symptoms among healthcare providers in Jordan.

Methods: Post-COVID-19 syndrome refers to symptoms extending beyond 4–12 weeks. We conducted a historical cohort study among 140 healthcare staff employed at the National Center for Diabetes, Endocrinology and Genetics, Amman, Jordan. All of them had been infected with COVID-19 virus during March 2020 to February 2022. Data were collected through face-to-face interviews using a structured questionnaire.

Results: Some 59.3% of the study population reported more than 1 persisting COVID-19 symptom, and among them 97.5%, 62.6% and 40.9% reported more than 1 COVID-19 symptom at 1–3, 3–6 and 6–12 months, respectively, after the acute phase of the infection. Post-COVID-19 syndrome was more prevalent among females than males (79.5% vs 20.5%) ($P = 0.006$). The most frequent reported symptom was fatigue. Females scored higher on the Fatigue Assessment Scale than males [23.26, standard deviation (SD) 8.00 vs 17.53, SD 5.40] ($P < 0.001$). No significant cognitive impairment was detected using the Mini-Mental State Examination and the Montreal Cognitive Assessment scales.

Conclusion: More than half (59.3%) of the healthcare workers in our study reported post-COVID-19 syndrome. Further studies are needed to better understand the frequency and severity of the syndrome among different population groups.

Keywords: COVID-19, post-COVID syndrome, healthcare workers, fatigue, Jordan

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Introduction

Globally, as of 29 July 2022, 572 239 451 cases of COVID-19 and 6 390 401 deaths had been confirmed. In Jordan, between 3 January 2020 and 29 July 2022, 1 709 879 confirmed cases of COVID-19 and 14 074 deaths were reported to the World Health Organization (1).

In July 2021, persistent and significant increase in cases of post-COVID-19 syndrome as a health problem, the Office for Civil Rights of the Department of Health and Human Services and the Civil Rights Division of the Department of Justice jointly recommended that post-COVID-19 syndrome be recognized as a disability under the Americans with Disabilities Act (2).

Post-COVID-19 conditions cover a wide range of new, recurring or ongoing health symptoms experienced by individuals ≥ 4 weeks after recovery from the acute phase of COVID-19 infection. Post-COVID conditions include: long COVID-19, long-term effects of COVID-19, long-haul COVID-19, post-acute COVID-19 or chronic COVID-19.

Although there is no consensus regarding the definition of post-COVID-19 syndrome, the US Centers for Disease Control and Prevention describes it as the persistence of symptoms more than 4 weeks after being infected with COVID-19 (2). Post-acute COVID-19 has been classified as subacute or persistent symptoms (up

to 12 weeks from the initial acute phase) and chronic or post-COVID-19 symptoms when symptoms are present beyond 12 weeks (3). Others have defined post-acute COVID-19 and chronic COVID-19 as symptoms extending beyond 3 weeks and beyond 12 weeks respectively from the onset of the first symptoms (4).

The symptoms can occur in anyone who has been infected with COVID-19, even if the illness was asymptomatic or mild. Commonly reported post-COVID-19 symptoms include shortness of breath, fatigue or tiredness, post-exertional malaise, difficulty concentrating or thinking (brain fog), cough, chest or stomach pain, headache, palpitations, joint or muscle pain, diarrhoea, sleep problems, fever, dizziness, mood changes and change in smell or taste (2).

A recent cohort study conducted on 418 young adults showed that more than half the COVID-19-positive outpatients reported persistent symptoms up to 10 months after infection, with fatigue, smell/taste disorder, dyspnoea and memory impairment being the most commonly encountered symptoms. Being female and overweight/obese were predictors of persistent symptoms (5).

In Jordan, a cross-sectional online questionnaire-based study reported that 72% of patients who had

recovered from COVID-19 infection experienced ≥ 1 post-COVID-19 syndrome symptoms, with dyspnoea, fatigue, impairment of taste/smell, cough and depression being the most commonly reported. Female sex, age ≥ 30 years, having a co-morbidity such as diabetes, hypertension or respiratory disease or having had a neuropsychological disturbance during the illness were all associated with a significantly higher risk of developing post-COVID-19 syndrome (6).

The wide variety of symptoms that have been reported in post-COVID-19 syndrome, involving multiple systems and organs, necessitate not only a long-term follow-up but also a better understanding of the heterogeneity of post-COVID-19 syndrome. The primary objective of this study was to evaluate the frequency and nature of persistent symptoms of COVID-19 infection among a group of Jordanian healthcare providers working at the National Center for Diabetes, Endocrinology and Genetics.

Methods

Participants

This was a historical cohort study. We recruited all 140 healthcare workers (nurses, physicians, pharmacists and other staff) at the National Center for Diabetes, Endocrinology and Genetics in Amman, Jordan, who had been infected with COVID-19 virus in the period March 2020–February 2022. Participants were diagnosed using polymerase chain reaction (PCR) test on a nasopharyngeal swab.

This study aimed to detect post-COVID-19 syndrome among healthcare providers. Data were collected by 2 general practitioners working at the National Center for Diabetes, Endocrinology and Genetics through face-to-face interview using a pre-designed, structured questionnaire. The questionnaire had 3 parts: the first part gathered information on sociodemographic and general personal health characteristics along with the presenting symptoms of COVID-19 and any medications given as treatment for the infection. The second part covered the most frequent signs and symptoms of COVID-19 infection during the acute phase and ≥ 3 months after recovery. The COVID-19 symptoms were compared with those of influenza-like illness in terms of severity, and were subsequently classified into: similar, milder, more severe or extremely more severe than the usual influenza symptoms. As there is no consensus definition about timing of post-COVID-19 symptoms, post-COVID-19 syndrome in our study refers to those symptoms extending beyond 4–12 weeks. Therefore, symptoms which persisted beyond 4–12 weeks after the initial infection were recorded.

The third part of the questionnaire assessed fatigue and cognitive status 12 weeks after recovery from the acute illness. Since the Fatigue Assessment Scale (FAS) has been used to assess fatigue as a valid and reliable measure in several disorders (7), we selected the FAS questionnaire as a tool to assess the presence of fatigue in participants

before and 12 weeks after recovery from acute COVID-19 infection. The FAS questionnaire comprises 10 questions from 2 different viewpoints: 5 questions investigate mental fatigue, the other 5 investigate physical fatigue. Responses are analysed by attributing numerical values 1–5 to the answers; answers to questions 4 and 10 are reverse scored. The total score obtained by summing up the score of all answers ranges from 10 to 50. Each score ranges from 5 to 25. A patient with a score < 22 is considered unaffected by fatigue (8).

The Mini-Mental State Examination (MMSE), which was originally designed to screen for dementia, is now the most widely used scale for the assessment of cognitive impairment. The MMSE is divided into 6 cognitive subsets: attention, orientation, language, recall, registration and constructional praxis. A cut-off score < 24 is indicative of cognitive impairment (9). The Montreal Cognitive Assessment (MoCA) was also developed to detect mild cognitive impairment. It is divided into 7 cognitive domains: visuospatial, attention, language, naming, recall, abstraction and orientation. A cut-off score < 26 is indicative of cognitive impairment (10).

Consent and ethics

Informed consent was given by all participants at the start of the study, and the ethics committee of the National Center for Diabetes, Endocrinology and Genetics Research approved the study. Data were kept confidential and were used only for scientific purposes.

Statistical analysis

Categorical variables were presented as numbers and percentages and compared using the chi-squared test. We compared the fatigue scores for before and after COVID-19 infection using the *t*-test for continuous variables. A *P*-value of < 0.05 was considered statistically significant. We performed all analyses using SPSS, version 20.

Results

Participants

This study included 140 healthcare workers (nurses, physicians, pharmacists and other staff) at the National Center for Diabetes, Endocrinology and Genetics (29.0% males, 71.0% females). Age range was 23–75 years, with mean age 34.45 [standard deviation (SD) 6.20] years. The demographic and clinical characteristics of the study population are presented in Table 1. Half the participants were younger than 35 years. Approximately 51.4% were either obese or overweight and 22.1% were current smokers. Only 8% of the participants had diabetes or prediabetes, and 2.1% had hypertension.

When the participants were asked to compare COVID-19 symptoms to the usual influenza symptoms, 50.0% of them reported that the COVID-19 symptoms were more severe, while 10.7% said the symptoms were extremely more severe. During the COVID-19 infection,

Table 1 Demographic and clinical characteristics of the study sample, healthcare workers in Jordan (n = 140), 2022

Characteristic	Mean (SD)
Mean age (years)	34.45 (6.20)
Body mass index (kg/m ²)	25.92 (4.30)
	No. (%)
Age (years)	
< 35	70 (50.0)
≥ 35	70 (50.0)
Body mass index^a	
Normal	68 (48.6)
Overweight	55 (39.3)
Obese	17 (12.1)
Sex	
Male	41 (29.3)
Female	99 (70.7)
Marital status	
Single	35 (25.0)
Married	101 (72.1)
Divorced/separated	4 (2.9)
Smoking	
Current	31 (22.1)
Past	5 (3.6)
Non-smoker	104 (74.3)
Comorbidity	
Diabetes or prediabetes	8 (8.0)
Hypertension	3 (2.1)
Cardiovascular disease	2 (1.4)
Pulmonary	1 (0.7)
Neurological disease	1 (0.7)
Allergy	9 (6.4)
Severity of COVID-19 infection^b	
Similar	23 (16.4)
Milder	32 (22.9)
More severe	70 (50.0)
Extremely more severe	15 (10.7)
Treatment received for COVID-19 infection	
Antiviral treatment	4 (2.9)
Antibiotic treatment	53 (37.9)
Steroid therapy	13 (9.3)
Oxygen therapy	3 (2.7)
Anticoagulation	4 (2.9)
Acetylsalicylic acid	36 (25.7)
Antipyretic treatment	75 (53.6)
Analgesic	69 (49.3)
Vitamins	98 (70.0)
Antihistamine	36 (25.7)

SD = standard deviation.

^aNormal: 18.5–24.9 kg/m²; overweight: 25–29.9 kg/m²; obese: ≥ 30 kg/m².^bCompared with influenza symptoms.

70.0% of the individuals took vitamins and 37.9% of them were given antibiotics in their treatment.

Post-COVID-19 syndrome

The prevalence of ≥ 1 persisting COVID-19 symptoms was 59.3%, with 97.5% having persistent symptoms 1–3 months after the acute phase of the infection; 62.6% still reported the presence of ≥ 1 COVID-19 symptoms 3–6 months after, and 40.9% reported the persistence of symptoms 6 months to 1 year after the acute infection (Table 2).

The prevalence of post-COVID-19 syndrome was statistically significantly greater among females than among males (79.5% vs 20.5%) ($P = 0.006$) (Table 3). There was no association between post-COVID-19 syndrome and age, body mass index, smoking status or other comorbidities.

The most frequent symptoms of COVID-19 infection during the acute phase of infection and follow-up period

The participants in our study had reported a wide variety of symptoms during the acute phase of infection. The most common presenting symptoms were fatigue and joint or muscle pain, both 73.6%; followed by headache, 71.4%; fever, 63.6%; cough, 60.0%; and mood changes, 58.4%. The most frequent symptoms encountered by our participants after 1 month, 3 months, 6 months, and 12 months were fatigue, joint or muscle pain, and difficulty thinking or concentrating (brain fog). (Table 4).

Around 16% of female participants reported changes in their menstrual cycle during the acute phase, while 10.7% and 5.7% reported menstrual changes 3 and 6 months respectively after the acute infection. The most commonly reported changes were increase in menstrual pain or cramps (14.1% during the acute phase, 6.1% after 3 months, 5.1% after 6 months), followed by an increase in the symptoms of premenstrual syndrome (12.1% during the acute phase, 6.1% after 3 months, and 4.0% after 6 months) and irregular menstruation (12.1% during the acute phase, 4.0% after 3 and 6 months).

Fatigue was one of the most frequently reported post-COVID-19 syndrome symptoms. A statistically significant difference was found in the FAS between males and females, with higher scores for females (23.22; SD 7.9)

Table 2 Duration of persistent symptoms of COVID-19 infection among healthcare workers in Jordan (n = 140), 2022

Presence of ≥ 1 persistent COVID symptoms (duration, months)	No. (%)
1–3	81 (97.5)
3–6	52 (62.6)
6–12	34 (40.9)
Total	83 (59.3)

Table 3 Association between post-COVID syndrome and demographic and clinical characteristics of healthcare workers (n = 140) who had had COVID-19, Jordan, 2022

Characteristic	Post-COVID-19 syndrome ^a	P-value
	No. (%)	
Total	83 (59.3)	
Age (years)		
< 35	37 (44.6)	0.122
≥35	46 (55.4)	
Sex		
Females	66 (79.5)	0.006
Males	17 (20.5)	
Body mass index^b		
Normal	43 (51.8)	0.251
Overweight	33 (39.8)	
Obese	7 (8.4)	
Smoking		
Smoker	17 (20.5)	0.218
Non-smoker	66 (79.5)	
Comorbidity		
Diabetes	6 (6.2)	0.406
Hypertension	1 (1.2)	0.355
CVD	2 (1.3)	0.238
Pulmonary disease	1 (1.2)	0.406
Neurological disease	1 (1.2)	0.406
Allergy	5 (6.0)	0.814

^aPatients with one or more persisting symptoms.

CVD = cardiovascular disease.

^bNormal: 18.5–24.9 kg/m²; overweight: 25–29.9kg/m²; obese: ≥ 30 kg/m².

than for males (17.44; SD 5.4; $P < 0.001$). No statistically significant difference in FAS score was observed for body mass index, age or smoking status (Table 5).

A cognitive assessment was also conducted during the last follow-up visit. Cognitive performance was measured using the MMSE and the MocA, scales. The mean MMSE score for females was 27.44 (SD 2.4) compared with 27.50 (SD 3.1) for males. The mean MocA score for females was 27.32 (SD 2.7) compared with 26.85 (SD 3.4) for males. There was no statistically significant difference between mean MMSE and MocA scores between males and females ($P = 0.907$ and 0.399 respectively). We did not detect any statistically significant cognitive impairment in our participants.

Discussion

In this study, the prevalence of post-COVID-19 syndrome symptoms was 59.3%. This was consistent with the findings of other studies. Fernández-de-Las-Peñas et al. concluded that post-COVID-19 symptoms were present in up to 60% of COVID-19 survivors (11); Huang et al., Taboada et al. and Carfi et al. (12–14) reported higher prevalence rates: 76%, 84% and 87% respectively. In a 2020 prospective cohort study among 400 patients who were followed up for one month after clinical improvement from COVID-19 infection, 46% of patients developed post-COVID-19 symptoms (15). This variation in the prevalence of post-COVID-19 syndrome could be due to differences in study design, duration and participants.

Table 4 Clinical manifestations of COVID-19 infection among healthcare workers (n = 140) during the acute phase and follow-up period, Jordan, 2022

Symptom	During acute phase	After 1 month	After 3 months	After 6 months	After 12 months
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Shortness of breath	77 (55.0)	26 (18.6)	8 (5.7)	4 (2.9)	2 (1.4)
Tiredness or fatigue	103 (73.6)	52 (37.1)	26 (18.6)	14 (10.0)	11(7.9)
Post-exertional malaise	77 (55.0)	33 (23.6)	19 (13.6)	8(5.7)	5 (3.6)
Difficulty thinking or concentrating (brain fog)	59 (42.1)	34 (24.3)	24 (17.1)	12 (8.6)	9 (6.4)
Cough	84 (60.0)	25 (17.9)	4 (2.9)	3 (2.1)	1 (0.7)
Chest pain	54 (38.6)	12 (8.6)	5 (3.6)	1 (0.7)	1 (0.7)
Headache	100 (71.4)	20 (14.3)	10 (7.1)	3 (2.1)	5 (3.6)
Palpitations	32 (22.9)	8 (5.7)	2 (1.4)	2 (1.4)	0 (0.0)
Joint or muscle pain	103 (73.6)	35 (25.0)	25 (17.9)	15 (10.7)	11 (7.9)
Numbness	26 (18.6)	6 (4.3)	5 (3.6)	2 (1.4)	2 (1.4)
Diarrhoea	42 (30.0)	3 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)
Sleep problems	52 (37.1)	12 (8.6)	4 (2.9)	4 (2.9)	4 (2.9)
Fever	89 (63.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dizziness	56 (40.0)	8 (5.7)	2 (1.4)	1(0.7)	1 (0.7)
Skin rash	13 (9.3)	3 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)
Mood changes ^a	69 (58.4)	19 (13.6)	12(8.6)	8 (5.7)	5 (3.6)
Loss of smell	48 (34.3)	26 (18.6)	14 (10.0)	8 (5.7)	7 (5.0)
Loss of taste	80 (57.1)	22 (15.7)	9 (6.4)	3 (2.1)	2 (1.4)

^aMood changes: anxiety and depression.

Table 5 Fatigue scores among healthcare workers (n = 140) after COVID-19 infection according to the Fatigue Assessment Scale (FAS) for selected variables (using score as a continuous variable), Jordan, 2022

Variable	Total FAS score Mean (SD)	P-value
Sex		
Male	17.44 (5.40)	< 0.001
Female	23.22 (7.90)	
Body mass index (kg/m²)^a		
Normal	21.20 (7.30)	0.770
Overweight + obese	21.67 (8.10)	
Age (years)		
< 35	22.10 (8.20)	0.369
≥ 35	20.87 (7.00)	
Follow-up duration		
Acute phase	29.32 (9.30)	–
1 month	22.93 (8.80)	
3 months	20.75 (7.20)	
6 months	21.47 (7.10)	
12 months	19.89 (7.30)	
Smoking		
Smoker	18.96 (8.40)	0.020
Non-smoker	22.45 (7.20)	

Patients having an FAS score > 22 were considered to be affected by fatigue. SD = standard deviation.

^aNormal: 18.5–24.9 kg/m²; overweight: 25–29.9 kg/m²; obese: ≥ 30 kg/m².

In our study, post-COVID-19 syndrome was more prevalent among females. Many other studies have also found that females were more prone to having post-COVID-19 syndrome than males (12, 15–19).

The most frequently encountered post-COVID-19 syndrome symptom in our study was fatigue. Other studies have also found that fatigue was frequently experienced by patients with post-COVID-19 syndrome (20–23). Using the Fatigue Severity Scale and the Chalder Fatigue Scale, Raman et al. and Townsend et al. reported the prevalence of fatigue as 55% and 53%, respectively (24,25).

Post-infectious fatigue syndrome (also known as chronic fatigue syndrome, post-viral fatigue syndrome, or myalgic encephalomyelitis) refers to severe, persistent

and disabling recurrent mental and/or physical fatigue following infection with agents such as bacteria and viruses. The etiology of post-infectious fatigue syndrome remains unknown, and a number of mechanisms have been suggested as possible cause, e.g. neuroinflammation, increased oxidative stress, mitochondrial dysfunction, immunodysfunction and hereditary predisposition. The major symptoms of post-infectious fatigue syndrome include easy fatigability, pain, post-exertional malaise and sleep abnormalities that may be present for at least 6 months (26).

In our study, females were more likely to be impacted by fatigue than males. A significant difference in the FAS score was noted in this study. Females had a higher mean FAS score than males [23.26 (SD 8.0) vs 17.53 (SD 5.4)] ($P < 0.001$). Serafini et al. also concluded that females were more affected by fatigue than males in a group of Italian COVID-19 syndrome survivors; the researchers stressed the fact that males and females did differ in their immunological response (27). In other research, males were more susceptible to severe acute COVID-19 infection (28), while females were more prone to the development of long-term post-COVID-19 symptoms, especially chronic fatigue (25).

Our study had some limitations. First, most symptoms were subjective and prone to recall bias. Second, this was a single-centre study; participants were followed up through face-to-face interview and we did not assess them during the acute phase of their illness. Third, the number of participants was limited considering the total number affected during the epidemic, and more representative findings could have been obtained if a larger sample size had been used.

Conclusion

Post-COVID-19 syndrome was relatively common (59.3%) among this group of Jordanian healthcare workers, with fatigue being the most frequently encountered symptom. Females were more likely to be impacted by fatigue than males. Further studies are needed to give a better understanding of the frequency and nature of post-COVID-19 syndrome.

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Competing interests: None declared.

Syndrome post-COVID-19 chez les agents de santé en Jordanie

Résumé

Contexte : Le syndrome post-COVID-19 couvre un large éventail d'affections nouvelles, récurrentes ou chroniques, qui peuvent toucher toute personne ayant guéri de la COVID-19. Ces affections peuvent avoir une incidence sur plusieurs systèmes et organes.

Objectifs : Évaluer la fréquence et la nature des symptômes persistants de la COVID-19 chez les prestataires de soins de santé en Jordanie.

Méthodes : Le syndrome post-COVID-19 désigne des symptômes s'étendant au-delà de quatre à douze semaines. Nous avons mené une étude de cohorte historique auprès de 140 agents de santé employés au Centre national

du diabète, de l'endocrinologie et de la génétique, à Amman (Jordanie). Tous avaient été infectés par le virus de la COVID-19 entre mars 2020 et février 2022. Les données ont été recueillies lors d'entretiens en personne à l'aide d'un questionnaire structuré.

Résultats : Près de 59,3 % de la population étudiée a signalé plus d'un symptôme persistant de la COVID-19, et parmi eux, 97,5 %, 62,6 % et 40,9 % ont rapporté plus d'un symptôme de COVID-19, un à trois mois, trois à six mois et six à douze mois respectivement après la phase aiguë de l'infection. Le syndrome post-COVID-19 était plus répandu chez les femmes que chez les hommes (79,5 % contre 20,5 %) ($p = 0,006$). La fatigue constituait le symptôme le plus souvent signalé. Les femmes ont obtenu des résultats plus élevés sur l'échelle d'évaluation de la fatigue que les hommes [23,26, écart type (ET) 8,00 contre 17,53, ET 5,40] ($p < 0,001$). Aucun trouble cognitif significatif n'a été détecté à l'aide des échelles du Mini-Mental State Examination et du Montreal Cognitive Assessment.

Conclusion : Plus de la moitié (59,3 %) des agents de santé participant à notre étude ont fait état d'un syndrome post-COVID-19. D'autres études sont nécessaires pour mieux comprendre la fréquence et la gravité de ce syndrome dans différents groupes de population.

متلازمة ما بعد كوفيد-19 في صفوف العاملين في مجال الرعاية الصحية في الأردن

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الخلاصة

الخلفية: تشمل متلازمة ما بعد كوفيد-19 مجموعة واسعة من الحالات الصحية الجديدة أو المتكررة أو المستمرة، التي يمكن أن تحدث لأي شخص قد تعافى من كوفيد-19. وربما تؤثر هذه الحالة في العديد من أجهزة الجسم وأعضائه.

الأهداف: هدفت هذه الدراسة إلى تقييم تواتر أعراض كوفيد-19 المستمرة وطبيعتها في صفوف مقدمي الرعاية الصحية في الأردن.

طرق البحث: تشير متلازمة ما بعد كوفيد-19 إلى الأعراض التي تمتد لأكثر من 4-12 أسبوعاً. وقد أجريت دراسةً أترابيةً تاريخيةً على 140 عاملاً في مجال الرعاية الصحية يعملون في المركز الوطني للسكري والغدد الصم والوراثة، عمان، الأردن. وكانوا جميعهم قد أصيبوا بفيروس كوفيد-19 في المدة من مارس/ آذار 2020 إلى فبراير/ شباط 2022. وجمعت البيانات عن طريق إجراء مقابلات وجهًا لوجه باستخدام استبيان منظم.

النتائج: أفاد نحو 59.3% من المشاركين في الدراسة بوجود أكثر من عرض واحد من أعراض كوفيد-19 المستمرة، وأفاد من بينهم 97.5% و 62.6% و 40.9% بوجود أكثر من عرض واحد من أعراض كوفيد-19 تستمر 1-3 أشهر، و 3-6 أشهر، و 6-12 شهرًا على التوالي بعد المرحلة الحادة من العدوى. وكانت متلازمة ما بعد كوفيد-19 أكثر انتشارًا بين الإناث منها بين الذكور (79.5% مقابل 20.5%) (القيمة الاحتمالية = 0.006). وكان التعب أكثر الأعراض المبلغ عنها من حيث التواتر. وسجلت الإناث درجات أعلى في مقياس تقييم التعب مقارنةً بالذكور [23.26، الانحراف المعياري 8.00 مقابل 17.53، الانحراف المعياري 5.40] (القيمة الاحتمالية > 0.001). ولم يُكتشف أي خلل معلوماتي كبير باستخدام فحص الحالة العقلية المصغر، ومقاييس مونريال للتقييم المعلوماتي.

الاستنتاجات: أفاد أكثر من نصف العاملين في مجال الرعاية الصحية (59.3%) الذين شملتهم دراستنا بإصابتهم بمتلازمة ما بعد كوفيد-19. وهناك حاجة إلى إجراء مزيد من الدراسات لفهم تواتر المتلازمة ووخامتها على نحو أفضل بين مختلف الفئات السكانية.

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