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# Psychiatric comorbidities among COVID-19 survivors in North India: A cross-sectional study

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## Abstract:

**BACKGROUND:** The coronavirus disease-19 (COVID-19) emerged from China and rapidly spread to many other countries all over the world. This study aimed to assess the prevalence of anxiety, depression, posttraumatic stress disorder, and obsessive-compulsive (OC) symptoms among COVID-19 survivors after their discharge from the COVID-19 treatment center.

**MATERIALS AND METHODS:** This was a cross-sectional, hospital-based study performed among 119 COVID-19 survivors. The Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression. Posttraumatic Stress Disorder (PTSD)-Checklist (PCL) and Brief OC Scale were used to measure PTSD and OC symptoms. Data were analyzed by descriptive and inferential statistics using the SPSS (IBM Corp. Released 2015 version 23.0).

**RESULTS:** The mean anxiety, depression, and PTSD scores were,  $7.12 \pm 0.68$ ,  $8.08 \pm 0.22$ , and  $19.78 \pm 0.88$ , respectively. Based on cutoff scores, the prevalence of anxiety, depression, and PTSD among COVID-19 survivors was  $n = 53$ , 44.54%;  $n = 73$ , 61.34%; and  $n = 30$ , 25.21%, respectively. Older COVID-19 survivors ( $\geq 50$  years) were more likely to show symptoms of depression and anxiety ( $P < 0.001$ ) compared to younger ones. Furthermore, COVID-19 survivors who were  $\geq 50$  years of age experienced a greater level of PTSD compared to younger ones; similar trends were seen in those experiencing OC symptoms. In the present study,  $n = 98$  (82.4%) were obsessed with fears of contamination and an equal number had compulsive handwashing.

**CONCLUSION:** Anxiety, depression, PTSD, and OC symptoms are common among the COVID-19 survivors and that underscores the need to diagnose and manage mental health morbidities among these survivors long after their recovery from COVID-19.

## Keywords:

Anxiety, COVID-19, depression, obsessive-compulsive disorder, posttraumatic stress disorder, prevalence, survivors

## Introduction

The outbreak of the coronavirus disease-19 (COVID-19) in Wuhan, China, and its rapid spread worldwide has transformed the psychology and interpersonal relationships of millions across the globe. The initial emotional response of fear and uncertainty in a pandemic is followed by negative emotions such as stress, anxiety, and depression

which can lead to social discontent and mental health issues.<sup>[1]</sup>

Patients with severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) have been shown to experience psychological distress after cure as well as during their illness, while 35% of the SARS survivors in Hong Kong reported significant anxiety and/or depressive symptoms at 4 weeks or more after discharge.<sup>[2]</sup> Park *et al.* in South Korea

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reported that 27% of the MERS survivors had depression in comparison to 43% of the MERS survivors who had posttraumatic stress disorder (PTSD) 12 months after the advent of the outbreak.<sup>[3]</sup>

Similar to an epidemic of SARS and MERS, COVID-19 patients were likely to develop depressive and anxiety symptoms, as well as other psychiatric disorders during their quarantine and hospitalization.<sup>[4]</sup>

The psychological morbidity in a pandemic not only affects the patients directly but also the general population. Knowledge of the risk factors for COVID-19 mortality can affect a person's perception of the likelihood of death from COVID-19 leading to traumatizing experience and subsequent psychiatric symptoms in patients with COVID-19. PTSD is a stress-related psychological illness that occurs immediately after a trauma, such as a severe accident or exposure to violence.<sup>[5,6]</sup>

In previous disease outbreaks, the prevalence of PTSD after developing a serious infectious disease ranged from 4% to 41% in the general population.<sup>[7]</sup> Following the outbreak of COVID-19, rates of PTSD in COVID-19 survivors ranged between 5% in China and 31.8% in the United States.<sup>[8,9]</sup> Only a few studies have addressed this important issue, although a high prevalence of PTSD is expected among patients infected with SARS-CoV-2.<sup>[8,10,11]</sup>

For COVID-19 patients, several stressors were reported related to the psychiatric implications, such as prognosis of COVID-19,<sup>[12]</sup> isolation with limited social support,<sup>[13]</sup> limited information about the epidemic,<sup>[13]</sup> financial burden,<sup>[12]</sup> and stigma.<sup>[13]</sup> Furthermore, the stress of the work overload on health-care staff,<sup>[14]</sup> widespread fear, and public concern<sup>[15]</sup> further exacerbate patient's anxiety and depressive symptoms. An important risk factor for mental illness during a pandemic is an individual's constant worry about self and family members.<sup>[16]</sup> Stressful life events may precipitate or predispose individuals to the development of obsessive-compulsive (OC) disorder (OCD) symptoms. The intense focus on the danger of contamination from a virus during COVID-19, with the ensuing major disruption of personal health, social routines, health systems, and the economy, may increase the risks associated with the genesis of OCD symptoms in the population.<sup>[17]</sup>

While COVID-19 shares some of the characteristics of previous epidemics however it, as a new type of emerging infectious disease (EID), shows different characteristics when compared with past EIDs, like high infectivity, prevalence, public health impact,<sup>[18]</sup> and dearth of knowledge of psychological distress in its survivors after cure prompted us to take this study.

## Materials and Methods

### Study design and setting

This was a cross-sectional hospital-based study conducted among COVID-19 survivors under the aegis of the Institute of Mental Health and Neurosciences, Kashmir, in collaboration with the Department of Respiratory Medicine, Government Medical College, Srinagar, who visited the COVID-19 survivor clinic. This was a time-bound study and data collection was done over a period of 2 months (September and October 2020) by trained data collectors either by face-to-face interview or through self-administration of the questionnaire (for those who were literate). The study was approved by the institute's Ethics Committee under ethical approval number IEC/IMHANS/231-6, and the highest level of anonymity and confidentiality was maintained. A convenience sampling technique was employed to recruit the COVID-19 survivors into the study. A COVID-19 survivor was defined in our study as an adult (18 years and older) with a confirmed positive result on reverse transcription-polymerase chain reaction testing for the COVID-19 virus on oropharyngeal and nasopharyngeal fluid who was treated successfully and discharged with a COVID-19 discharge certificate.

We excluded survivors who had a history of previous psychiatric illnesses or severe physical or mental sequelae such as hearing problems that limit their participation in the study. We also excluded patients with chronic medical conditions such as chronic obstructive pulmonary disease, bronchial asthma, and pulmonary tuberculosis. Informed written consent was taken from each survivor, and each was given the freedom to opt-out of the study at any point in time.

### Data Collection and Technique

A semi-structured questionnaire was used to record sociodemographic details such as age, gender, marital status, occupation, residence, and education. COVID-19-related variables explored include their past medical history of psychiatric illness before being diagnosed with COVID-19 (yes/no) and knowledge of a relative or friend who died with COVID-19 (yes/no).

Anxiety and depression in this study were examined using the Hospital Anxiety and Depression Scale (HADS). The HADS consists of 14 items which are used to measure symptoms of anxiety and depression in the hospital, primary health-care facility, and among the general population.<sup>[19]</sup>

Each item on the scale was rated on a four-point Likert scale ranging from 0 to 3 to describe how often the COVID-19 survivors experienced the 14 items in the

last week after their discharge from the hospital. The HADS consists of seven items for the anxiety subscale and seven for the depression subscale.<sup>[20]</sup> The total score for each participant ranged from 0 to 21. Higher scores implied higher anxiety and depression levels. For both anxiety and depression, we used the recommended cutoff score of 8 and above according to a clinically tested classification of psychiatric morbidity.<sup>[19,21,22]</sup> The choice to use the HADS was informed by the fact that it has been used to measure anxiety and depression among survivors of a similar postinfectious disease outbreak such as SARS.<sup>[23]</sup> The HADS has previously been used in Sierra Leone among ex-Ebola Treatment Centre staff.<sup>[24]</sup>

In the present study, COVID-19 survivors were asked to tick a particular response that they think was closest to how they have been feeling in the past week. A score of  $\geq 8$  indicates a possible case of anxiety and depression.<sup>[19,21,22]</sup> The HADS ascertained high internal consistency with Cronbach's alpha coefficient of 0.87 and test-retest intraclass correlation coefficient of 0.97 and high concurrent validity.

To screen the prevalence of PTSD, the PTSD Checklist-5 (PCL-5) was used.<sup>[25]</sup> The PCL-5 is a 20-item self-report tool involving a five-point Likert-type scale, with scores ranging from "not at all" (0) to "extremely" (4), resulting in a symptom severity score of between 0 and 80; the PCL-5 assesses the presence and severity of PTSD symptoms. For the present study, if a score of 33 was obtained, then a diagnosis of PTSD was made.<sup>[26]</sup>

The 20-min (average duration) assessment also assessed OC symptoms with two items on the Brief Obsessive-Compulsive Scale (BOCS).<sup>[27]</sup> The two modified questions from the BOCS were:

"I am worried about dirt, germs, and viruses. Ex. Fear of getting germs from touching door handles or shaking hands or sitting in certain chairs or seats or fear of getting COVID-19."

"I wash my hands very often or in a special way to be sure I am not dirty or contaminated."

Ex. Washing one's hands many times a day or for long periods after touching, or thinking one has touched, a contaminated object.

The responses to the above questions were modified to "only during COVID-19 pandemic" or "never."

### Statistical analysis

We used percentages to summarize categorical variables. To analyze the relationship between two categorical

variables, we used the Chi-square test and reported two-sided exact *P* values. *P* < 0.05 was considered statistically significant. Data were analyzed using the SPSS (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, version 23.0 Armonk, NY, USA: IBM Corp.).

## Results

### Survivors clinical characteristics

Out of the 127 survivors who were asked to participate in the study, four refused to consent, two each were having comorbid chronic obstructive pulmonary disease, and bronchial asthma and were excluded, as a result of which 119 survivors were taken for the final analysis. The mean age of COVID-19 survivors was  $54.2 \pm 4.22$  years. A total of 96 (80.7%) survivors were in the age group of  $\geq 50$  years. More than half ( $n = 78, 65.5\%$ ) were male, more than three-fourths ( $n = 104, 87.40\%$ ) of the survivors were married, and almost three-fourths ( $n = 86, 72.3$ ) were from an urban background. A total of 49 (41.2%) survivors had knowledge of relative/friend dying due to COVID-19.

### Levels of anxiety symptoms and depressive symptoms, posttraumatic stress disorder, and obsessive-compulsive symptoms

The data related to different levels of anxiety and depressive symptoms in COVID-19 survivors are presented in Table 1. The mean value of anxiety score was  $7.12 \pm 0.68$ , and depression score was  $8.08 \pm 0.22$ . For anxiety symptoms, 32 (26.89%) patients were borderline cases, and 21 (17.65%) patients were evaluated as abnormal. For depressive symptoms, 27 (22.68%) patients

**Table 1: Levels of anxiety and depressive symptoms, posttraumatic stress disorder, and obsessive-compulsive disorder**

Scales	n	Rate (%)
Anxiety score		
0-7	66	55.46
8-10	32	26.89
>10	21	17.65
Depression score		
0-7	46	38.65
8-10	27	22.68
>10	46	38.65
PTSD score		
<33	89	74.79
$\geq 33$	30	25.21
I wash my hands very often or in a special way to be sure I am not dirty or contaminated		
Never	21	17.6
During COVID-19 pandemic	98	82.4
I am worried about dirt, germs, and viruses		
Never	21	17.6
During COVID-19 pandemic	98	82.4

PTSD=Posttraumatic stress disorder, COVID-19=Coronavirus disease-19

were borderline cases, and 46 (38.65%) patients were classified as abnormal. PTSD was seen in 30 (25.21%) survivors.

For anxiety symptoms, results showed that patients who aged  $\geq 50$  years had significantly higher rate of anxiety symptoms than those aged 30–49 years ( $\chi^2 = 30.46, P = 0.001$ ), as shown in Table 2. Significant differences were observed in gender ( $\chi^2 = 15.46, P = 0.001$ ), marital status ( $\chi^2 = 26.21, P = 0.001$ ), education ( $\chi^2 = 24.45, P = 0.001$ ), and knowledge of a relative/friend dying due to COVID-19 ( $\chi^2 = 26.20, P = 0.001$ ), as shown in Table 3.

Table 4 shows that survivors who were aged  $\geq 50$  years had significantly higher rate of depressive symptoms than those aged 30–49 years ( $\chi^2 = 53.11, P = 0.001$ ). Significant differences were observed in gender ( $\chi^2 = 11.18, P = 0.003$ ), marital status ( $\chi^2 = 52.56, P = 0.001$ ), and education ( $\chi^2 = 17.47, P = 0.020$ ).

The mean PCL-5 score was  $19.78 \pm 0.88$ . Table 4 shows that survivors who were aged  $\geq 50$  years had significantly higher posttraumatic symptoms than those aged 30–49 years ( $\chi^2 = 7.67, P = 0.017$ ). Significant

differences were observed in gender ( $\chi^2 = 5.62, P = 0.025$ ) and education ( $\chi^2 = 13.57, P = 0.007$ ).

New-onset OC symptoms were seen in 98 (82.4%) survivors. OC symptoms were more significantly seen in those survivors who were aged  $\geq 50$  years had significantly higher posttraumatic symptoms than those aged 30–49 years ( $\chi^2 = 6.22, P = 0.033$ ). Significant differences were observed in occupation ( $\chi^2 = 11.83, P = 0.012$ ) and knowledge of a relative/friend dying due to COVID-19 ( $\chi^2 = 4.52, P = 0.049$ ), as shown in Table 5. For hospital stay, anxiety and depressive symptoms were significantly seen in those having longer stay in the hospital, as shown in Table 6.

## Discussion

Viral respiratory infections are associated with both short- and long-term psychopathological disturbances in the survivors.<sup>[28]</sup> The degree of psychopathological reaction in an individual during COVID-19 may be related to several COVID-19-related factors. Panic of being diagnosed with COVID-19, unpredictable outcome and prognosis, shame and disgrace associated with the

**Table 2: Anxiety-symptom-associated factors in coronavirus disease-19 survivors**

Characteristics	Anxiety			P
	Normal (0-7)	Borderline (8-10)	Caseness (11+)	
Age (years)				
<30	2	11	0	0.001
30-49	3	5	2	
$\geq 50$	61	16	19	
Gender				
Male	36	30	12	0.001
Female	30	2	9	
Marital status				
Single	2	11	0	0.001
Married	62	21	21	
Widow/widower	2	0	0	
Occupation				
Farmer	0	2	0	0.096
Businessman	13	12	4	
Government employee	25	7	8	
Unemployed	28	11	9	
Residence				
Urban	49	25	12	0.230
Rural	17	7	9	
Education				
Illiterate	2	6	4	0.001
Studied up to 8 <sup>th</sup>	25	6	9	
Studied up to higher secondary level	25	8	0	
Graduate	12	12	8	
Postgraduate	2	0	0	
Knowledge of a relative/friend dying due to COVID-19				
Yes	22	8	19	0.001
No	44	24	2	

COVID-19=Coronavirus disease-19

**Table 3: Depression-associated factors in coronavirus disease-19 survivors**

Characteristics	Depression			P
	Normal (0-7)	Borderline (8-10)	Caseness (11+)	
Age (years)				
<30	0	13	0	0.001
30-49	3	0	7	
≥50	43	14	39	
Gender				
Male	22	19	37	0.003
Female	24	8	9	
Marital status				
Single	0	13	0	0.001
Married	44	14	46	
Widow/widower	2	0	0	
Occupation				
Farmer	0	0	2	0.063
Businessman	11	6	12	
Government employee	19	4	17	
Unemployed	16	17	15	
Residence				
Urban	37	19	30	0.285
Rural	9	8	16	
Education				
Illiterate	2	0	10	0.020
Studied up to 8 <sup>th</sup>	15	8	17	
Studied up to higher secondary level	15	10	8	
Graduate	12	9	11	
Postgraduate	2	0	0	
Knowledge of a relative/friend dying due to COVID-19				
Yes	16	11	22	0.451
No	30	16	24	

COVID-19=Coronavirus disease-19

disease, traumatic experiences of severe illness, and being quarantined or living alone during the pandemic are significant psychological stressors that may act as detrimental in defining the psychopathological outcome.<sup>[13,29]</sup>

Our study indicates that close to half (44.54%) of the survivors exhibited a possible diagnosis of anxiety which is slightly higher than those reported by Kong *et al.*<sup>[30]</sup> and Li *et al.*<sup>[31]</sup> in China. The SARS-CoV-2 infection has been implicated in neuropsychiatric manifestations during and after SARS and MERS outbreaks.<sup>[4]</sup>

In pandemics, there is a general increase in psychiatric comorbidity as has been seen in the SARS epidemic in the form of PTSD, depression, panic disorder, and OCD even at 1–50 months of follow-up.<sup>[2,32,33]</sup> Our findings mirror the results from previous coronaviruses outbreak studies, where the psychiatric morbidities ranged from 10% to 35% even in the postillness stage.<sup>[34]</sup> Mazza *et al.* also reported high rates of PTSD, depression, anxiety, insomnia, and OC symptomatology in a sample of COVID-19 survivors, thus corroborating with our study results.<sup>[35]</sup>

With regard to depression, our study indicates that more than half (61.33%) of the COVID-19 survivors interviewed show possible cases of depression. Zhang *et al.*<sup>[36]</sup> conducted a similar study in China and found depression to be prevalent in only 29.2% of the sample, thus contradicting our findings. Xin Cai *et al.* in their study found a prevalence of 31%, 22.2%, and 38.1% for excessive stress, anxiety, and depression, respectively, in early convalescence of COVID-19 survivors. Prior published literature all over the globe has shown an incidence of mental disorders after major disasters to range from 10% to 20%.<sup>[23,37,38]</sup>

The possible causes for higher psychiatric morbidity seem to be the severity of the disease, high infectivity as compared to prior pandemics,<sup>[39]</sup> nonavailability of definitive antiviral therapy,<sup>[39]</sup> and the risk of reinfection of the positive SARS-CoV-2 RNA in convalescence.<sup>[40,41]</sup> Second, with the popularization of the Internet and smartphones, people are overwhelmed with all kinds of information, resulting in more misunderstandings about the disease, excessive worries, and unnecessary fears. A recent study found that heavy media use increases the incidence of PTSD and depression in social unrest.<sup>[42]</sup>

**Table 4: Posttraumatic stress disorder-associated factors in coronavirus disease-19 survivors**

Characteristics	Normal	PTSD	P
Age (years)			
<30	13	0	0.017
30-49	5	5	
≥50	71	25	
Gender			
Male	53	36	0.025
Female	25	5	
Marital status			
Single	13	0	0.089
Married	74	30	
Widow/widower	2	0	
Occupation			
Farmer	2	0	0.320
Businessman	19	10	
Government employee	33	7	
Unemployed	35	13	
Residence			
Urban	63	23	0.641
Rural	26	7	
Education			
Illiterate	4	8	0.007
Studied up to 8 <sup>th</sup>	30	10	
Studied up to higher secondary level	28	5	
Graduate	27	7	
Postgraduate	2	0	
Knowledge of a relative/friend dying due to COVID-19			
Yes	37	12	1.0
No	52	18	

PTSD=Posttraumatic stress disorder, COVID-19=Coronavirus disease-19

Third, the isolation from family members and friends brings out helplessness and loneliness. Idleness during the isolation period is likely to lead to an increase in negative mood states, as well as worry about one's physical health.<sup>[12]</sup> Fourth, as indicated by the burden hypothesis,<sup>[43]</sup> the COVID-19 epidemic affects the employment and incomes of most families, which adds to psychological distress.

Our study reports that a quarter (25.2%) of the COVID-19 survivors interviewed showed possible cases of PTSD. A similar prevalence of posttraumatic stress reactions 4–6 weeks postdischarge was reported in a study by Chang and Park in Korea.<sup>[44]</sup> Compared to other infectious disease outbreaks, our study reported lower levels of PTSD than that reported on SARS survivors in Hong Kong.<sup>[23]</sup> In previous disease outbreaks, the prevalence of PTSD after developing a serious infectious disease ranged from 4% to 41% in the general population<sup>[7]</sup> and thus is in the range of our study results. Some factors, such as interpersonal conflict, lower socioeconomic status, female sex, frequent use of social media, and lower resilience and social support, have been

reported to increase the risk of PTSD.<sup>[45]</sup> Similar results were reported previously while 25.5% of the survivors continued to meet criteria for PTSD even after 30 months of contracting SARS.<sup>[46]</sup>

In the present study, 82.4% were obsessed with fears of contamination and an equal percentage (82.4%) had compulsive handwashing. The etiology of OCD is associated with the interplay of multiple risk factors, such as genes, environment, and life stressors.<sup>[47]</sup> Our results almost corroborate with the study done by Abba-Aji *et al.* in Canada who studied a total of 6041 and found that 60.3% of the respondents had obsessions and 53.8% had compulsions to wash hands repeatedly or in a special way, both of which started during the COVID-19 pandemic.<sup>[48]</sup>

In this study, OCD contamination symptoms were associated with age ≥50 years and those who were employed in government setup. These findings are in contrast with other studies reporting a significant association of OCD with younger age.<sup>[49]</sup> The mean age of respondents in our study is 54.2 ± 4.22 years which is higher than the generally reported mean age of the onset of 17.9 years for OCD.<sup>[50]</sup> This is important because the onset of OCD before 20 years of age is associated with a poor prognosis, whereas an onset over 20 tends to have a shorter course and better outcomes.<sup>[51]</sup>

We also found that the anxiety-symptom-associated factors were age and gender, which is consistent with Wang *et al.*<sup>[52]</sup> Individuals aged between 46 and 60 years often have the main responsibility and act as the backbone of their family – thus higher levels of anxiety in this age group. Moreover, females have probably a higher risk of anxiety than males. Acting as a leading caregiver in the family and being more sensitive to separation,<sup>[52]</sup> women are more prone to have anxiety symptoms.

We found that age and hospital stays are factors affecting the rate of depressive symptoms in COVID-19 patients. As same as anxiety symptoms, patients aged 46–60 years also had a higher rate of depressive symptoms. The results of this study also showed that depressive symptoms were associated with anxiety symptoms, and the stressors that influenced anxiety symptoms increased the possibility of depressive symptoms, including financial burden and family responsibilities. The present study demonstrated that time since admission or length of hospitalization could be associated with depressive symptoms, which was consistent with Brooks *et al.*<sup>[13]</sup> and Papaioannou *et al.*<sup>[53]</sup>

The results of this early-stage pandemic study support the proposal that surveying the OCD symptom dimensions is important for future pandemic planning, where strict public health measures (e.g., requiring

**Table 5: Obsessive-compulsive-symptom-associated factors in coronavirus disease-19 survivors**

Characteristics	OC symptoms/I am worried about dirt, germs, and viruses/I wash my hands very often or in a special way to be sure I am not dirty or contaminated		P
	Never	During COVID-19 pandemic	
Age (years)			
<30	0	13	0.033
30-49	4	6	
≥50	17	79	
Gender			
Male	12	66	0.449
Female	9	32	
Marital status			
Single	0	13	0.147
Married	21	83	
Widow/widower	0	2	
Occupation			
Farmer	2	0	0.012
Businessman	2	27	
Government employee	8	32	
Unemployed	9	39	
Residence			
Urban	14	72	0.593
Rural	7	26	
Education			
Illiterate	2	10	0.818
Studied up to 8 <sup>th</sup>	6	34	
Studied up to higher secondary level	8	25	
Graduate	5	27	
Postgraduate	0	2	
Knowledge of a relative/friend dying due to COVID-19			
Yes	13	36	0.049
No	8	62	

OC=Obsessive-compulsive, COVID-19=Coronavirus disease-19

**Table 6: Association of anxiety, depression, and posttraumatic stress disorder with days of hospital stay**

Parameters	Days of hospital stay			P
	≤7	8-14	>14	
Anxiety				
Normal (0-7)	33	33	0	0.001
Borderline (8-10)	14	18	0	
Caseness (11+)	0	10	11	
Depression				
Normal (0-7)	17	29	0	0.001
Borderline (8-10)	14	13	0	
Caseness (11+)	16	19	11	
PTSD				
Normal	39	43	7	0.226
PSTD	8	18	4	

PTSD=Posttraumatic stress disorder

regular handwashing, use of facemask, and social distancing) are implemented or enforced.

Our study should be viewed with few limitations. Cross-sectional design and small sample size may

limit the generalizability of the study. Several variables that could be potential risk factors for psychiatric comorbidity, such as personal characteristics and social support, were not investigated in the present study. Lack of control group and convenient sampling may give biased results.

### Conclusion

Our study suggests that anxiety, depression, PTSD, and OC symptoms are common among COVID-19 survivors. Our data support the proposal that public health advice during pandemics should incorporate mental health wellness campaigns aiming to reduce the psychological impact of pandemics. Cognitive behavior therapy and interpersonal therapy need to be explored as part of overall mental health-care package interventions.

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## Conflicts of interest

There are no conflicts of interest.

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