

Fear, Anxiety, Stress, and Depression of Novel Coronavirus (COVID-19) Pandemic Among Patients and Their Healthcare Workers – A Descriptive Study

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Purpose: Disease pandemics are known to cause psychological distress. The ensuing mental health issues are not only restricted to the patients and their relatives/friends but affect the healthcare workers (HCWs) as well. Our study aims to assess these psychological trends during the COVID-19 pandemic between the two most affected population groups, that is, patients and frontline healthcare workers.

Patients and Methods: A survey questionnaire, including scales to assess fear, anxiety, stress, depression – PSS 10, and DASS 21, was distributed and sent to all COVID-19 suspected/confirmed individuals and healthcare workers at a tertiary care center along with a second visit after 14 days of answering the first questionnaire and this continued as follow-up. Data were analyzed with the SPSS version 23 using various tests of significance.

Results: In the community, COVID-19 patients in the age group 41–50 with respiratory tract symptoms and those who were home isolated/quarantined experienced a greater tendency of mental health problems. Healthcare workers posted in COVID-19 designated areas of the hospital displayed higher levels of stress, anxiety, and depression.

Conclusion: The high degree of uncertainty associated with novel pathogens has a profound effect on the psychological state of suspected/confirmed cases as well as healthcare workers. Within the community, individuals suspected of having COVID-19 display a significant mental health burden, while HCWs also experience an unprecedented amount of stress, anxiety, depression and fear during such enduring situations.

Keywords: coronavirus disease 2019, fear, anxiety, depression, stress, survey, healthcare worker

Introduction

The novel coronavirus has spread across borders in a small-time affecting the world and was announced as a pandemic by WHO in March 2020.^{1,2} The Coronavirus initially appeared as a spurt of respiratory infections in December 2019. Widespread outbreaks are known to cause psychological distress and mental illnesses.³ Humanity has suffered at the hands of many such bio-disasters, such as Severe Acute Respiratory Syndrome (SARS), Flu, Plague, Ebola, and Middle East Respiratory Syndrome (MERS), among others, with each of them promulgating a certain level of fear and mental stress among frontline workers and the affected population.

The effect on the community of the COVID-19 pandemic is also evident in studies. Ni et al conducted a cross-sectional web-based study and found that among

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the 1577 community-based adults who participated in the study, about one-fifth of respondents reported probable anxiety ($n = 376$, 23.84%, 95% CI 21.8–26.0) and probable depression ($n = 303$, 19.21%, 95% CI 17.3–21.2).⁴ Within the community as well, patients afflicted with COVID-19 manifested higher levels of mental health burden. A gender effect was observed in the “Perceived Helplessness” score, the subscale of PSS-10, with female patients showing higher scores than male patients, female, and male controls. Even among clinically stable COVID-19 patients, a study showed the prevalence of significant posttraumatic stress symptoms associated with COVID-19 was 96.2% (95% CI 94.8–97.6%).⁵ Nguyen et al assessed the level of depression in outpatients in Vietnam. They interestingly witnessed that people with college/university or above educational attainment had higher odds of depression than those with elementary school/illiterate attainment.⁶ In addition, compared to people who had a low social status, were less healthy, had less physical activity, to those with middle or high social status, healthier, and had more physical activity had lower odds of depression. COVID-infected patients, including infected HCWs, who were quarantined and socially isolated, and people who were surrounded by bad information and widespread misinformation, happen to become victims of dread, panic, and misery more often. The psychological impact of quarantine and isolation was exacerbated by the harmful effects of limited physical activity and changes in dietary practices among quarantined individuals.⁷ Such changes may result in dramatic and long-lasting psychological impacts. A study on quarantined and isolated individuals with the severe acute respiratory syndrome (SARS) and H1N1 reported posttraumatic stress symptoms, confusion, and anger.⁸ Stressors included longer quarantine, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma.

These mental issues are not only restricted to patients and their close ones, but healthcare workers (HCWs) are also not immune to the stress caused by the spread of the disease.⁹ The high degree of uncertainty associated with novel pathogens profoundly affects the psychological state of HCWs working at the forefront. HCWs experience an unprecedented amount of stress during such enduring situations. HCWs are amongst the most important group to acquire the COVID-19 infection.¹⁰ Initial studies on COVID-19 showed that risk factors for emotional distress and poor mental health among HCWs were excessively linked to high workloads during the pandemic. Other

pivotal factors playing a major role in this aspect include shortages of healthcare personnel and protective equipment, a lack of disaster training, working in hospitals overwhelmed by COVID-19 cases, and a lack of effective treatments.¹¹ Ethical dilemmas in decision-making due to limited medical resources, the high risk of contagion and the fear of becoming infected or spread the infection to their relatives, witnessing patients’ deaths, separation from families and stigmatization by their communities. The extended and frequently changing shift times and risk of infection add to the pressure faced by these workers. The inability to effectively communicate while wearing personal protective equipment and poor performance of diagnostic procedures play a key role in the emergence of resentment in the minds of these brave warriors. A cross-sectional survey-based study during the COVID-19 pandemic illustrated that depression, anxiety, insomnia, and distress were widely prevalent among HCWs.¹² According to studies, the prevalence of anxiety amongst healthcare workers is high and has been assessed to be between 23.2% and 30.5%.^{13,14}

Our study emphasizes these psychological trends during the pandemic between the two most affected population groups: the patients and contacts and their treating frontline HCWs.

Patients and Methods

Settings and Participants

The research was conducted at a tertiary care hospital in North India between March and November 2020. A structured questionnaire was distributed electronically to all participants (universal sample size chosen with time-bound study). The study was conducted in compliance with the protocol and ethical approval was obtained from the institutional ethical committee, All India Institute of Medical Sciences (AIIMS), Rishikesh (CTRI/2020/05/025494). Before taking the survey, the respondents signed a consent document stating that they had provided their informed written consent. There were no benefits, and participation was on an opt-in voluntary basis at the COVID-19 screening outpatient department. Data security and anonymity were ensured.

Objective:

- To assess the mental impact of 2019 novel coronavirus (Covid-19) outbreaks among COVID-19 patients (suspects and confirmed), their close

contacts, and associated healthcare providers using a questionnaire-based study.

Inclusion criteria:

- All COVID-19 suspected/confirmed patients and high-risk contacts (family and friends) reporting for screening in OPD in a tertiary care hospital between March and November 2020. Designation of a suspect patient was made as per WHO COVID-19 case definition.
- All healthcare workers – doctors, nurses and health-care attendants [treating or managing these patients].

Exclusion criteria:

- Patients/subjects who did not consent.
- Patients/subjects below the age of 18.

Procedure/Intervention

An online Google form was created for the questionnaire ([Appendices 1](#) and [2](#)) comprising PSS (Perceived Stress Scale) and DASS 21 (Depression Anxiety and Stress Scale) questionnaire. After procuring their phone number through hospital record within 24 h of OPD visit, participants were contacted through WhatsApp or direct messaging or phone calls and instructed to properly read the consent form (first page of online questionnaire) and questionnaire, after which they were provided the link for the form to be filled.

PSS -The “PSS” suggested by Cohen et al in 1983 measures the degree to which individual situations are evaluated as being stressful or more precisely, unpredictable, uncontrollable, and intense (overloading in 1983, then overwhelming in 1991). The tool is composed of 14 items on a 5-point scale (going from “never” to “often”) (examples of items: “... have you ever been bothered by an unexpected event?” “... have you ever successfully coped with little problems and daily worries?”).¹⁵

DASS 21 - This was designed to measure emotional distress in three sub-categories (Lovibond and Lovibond, 1995) of depression (eg loss of self-esteem/incentives and depressed mood), anxiety (eg fear and anticipation of negative events), and stress (eg persistent state of over-arousal and low frustration tolerance). It is a self-reported questionnaire with 21 items (seven items for each category). To calculate comparable scores with full DASS, each 7-item scale was multiplied by two. Participants

were asked to rate how many of each of the items (in the form of statements) applied to them over the past days, using a 5-point scale (completely disagree to completely agree).¹⁶

Comparator and Outcome

There was no comparator, and the outcomes were measures of fear, anxiety, stress, and depression among the participants.

Statistical Analysis

Data were analyzed using the latest version of SPSS software (Version 23). Fisher’s exact test and the chi-square test were used to correlate the association. The Stuart-Maxwell test was used to assess the change in response in the HCW population between the first point of contact and follow-up. Statistical significance was set at a P-value <0.05.

Results

Of the 708 COVID-19 patients (suspects/confirmed/contacts) and 442 HCWs, 127 and 180 participants responded to the questionnaire, respectively.

Patients Group

The majority of patients were young adults, aged 20–40 years, male, and having a history of COVID-19 contact/close contact and in-home isolation ([Table 1](#)).

Fear

Individuals with no travel history had a greater degree of fear ([Figure 1A](#)). A certain level of fear of contracting the disease from HCWs was also prevalent in the general population. Fear of death due to COVID-19 infection was significantly greater in the age group of 51–60 years, whereas those in the 41–50-year age group had a higher incidence of bad dreams and nightmares.

Anxiety

Higher levels of anxiety were observed in symptomatic subjects in the form of difficulty breathing in the absence of any physical exertion ([Figure 1B](#)). The age group 41–50 were found to have significant anxiety with difficulty in relaxing and close to panicking. Home isolated/quarantined individuals had higher levels of anxiety manifesting as awareness of dryness of mouth and difficulty breathing in the absence of physical exertion.

Table 1 Descriptive Characteristics of COVID-19 Patient Population (Suspects/Confirmed/Contacts)

Parameters	Frequency (%)
Age (Years)	
≤20 Years	4 (3.1%)
21–30 Years	83 (65.4%)
31–40 Years	20 (15.7%)
41–50 Years	6 (4.7%)
51–60 Years	10 (7.9%)
61–70 Years	3 (2.4%)
71–80 Years	1 (0.8%)
Gender	
Male	78 (61.4%)
Female	49 (38.6%)
Month	
March	39 (30.7%)
April	8 (6.3%)
May	6 (4.7%)
June	22 (17.3%)
July	25 (19.7%)
August	12 (9.4%)
October	15 (11.8%)
Acute respiratory infection symptoms (Yes)	45 (35.4%)
Epidemiological Criteria 1 ^a (Yes)	54 (42.5%)
Epidemiological Criteria 2 ^b (Yes)	18 (14.2%)
Close Contact	
Yes	45 (35.4%)
No	60 (47.2%)
Maybe	22 (17.3%)
Home Isolation	
Yes	77 (60.6%)
No	48 (37.8%)
Maybe	2 (1.6%)

Notes: ^aIn the 14 days before the onset of symptoms, was in contact with a confirmed/probable case of Coronavirus infection. ^bIn the 14 days before the onset of symptoms, had a history of travel to areas with presumed ongoing community transmission.

Stress

Greater stress levels were observed among subjects who were home isolated or quarantined, juxtaposed to those who were not (Figure 2A). Participants with acute respiratory symptoms reported stress in the form of trembling. Subjects in the age group 41–50 predominantly complained of feeling nervous, worried in certain situations of panic, tendency to overreact, inability to control things in life, inability to overcome difficulties in daily life, and coping with things. Higher levels of stress were noted in subjects with a history of travel to areas with ongoing

community transmission. These individuals reported an inability to control important things in life, as well as the stress of unemployment during or after the disease. Those who visited the hospital reported stress in the form of trembling. The month of June noticed a high proportion of subjects who reported being upset due to things happening unexpectedly, inability to overcome difficulties in daily life, and anger at things being outside their control. A significant number of individuals complained of agitation in March as the lockdown phase began.

Depression

Participants with symptoms of acute respiratory infection reported worthlessness (Figure 2B). Those between the ages of and 41–50 complained of a feeling of nothing to look forward to, and a lack of enthusiasm. Subjects with a history of close contact with a positive case reported feeling downhearted and blue. A lack of initiative to do things was noted among subjects who were home isolated or quarantined. The month of June witnessed the highest number of subjects feeling worthless and had nothing to look forward to, while participants in May had a significantly higher incidence of lack of initiative to do things.

No patient group was followed up due to lack of response.

Healthcare Workers Group

The majority of HCWs were young adults, aged 20–40 years, male, resident workers, working in non-COVID area, and following all COVID-19 precautions (Table 2).

Fear

The fear of contracting COVID-19 infection was observed in 18.3% of subjects, while 51.7% of HCWs reported fear of transmitting the infection to their family members and loved ones (Figure 1C). No statistically significant difference was noted among the various demographic groups in terms of fear during the pandemic.

Anxiety

A significant number of subjects had a history of acute respiratory symptoms, and 14.4% of subjects reported dryness of the mouth (Figure 1D). Palpitation, tremors, feeling scared for no reason, and a tendency to panic were reported by HCWs who were working in designated COVID wards. HCWs with a history of contact with a COVID positive/suspect case claimed that they

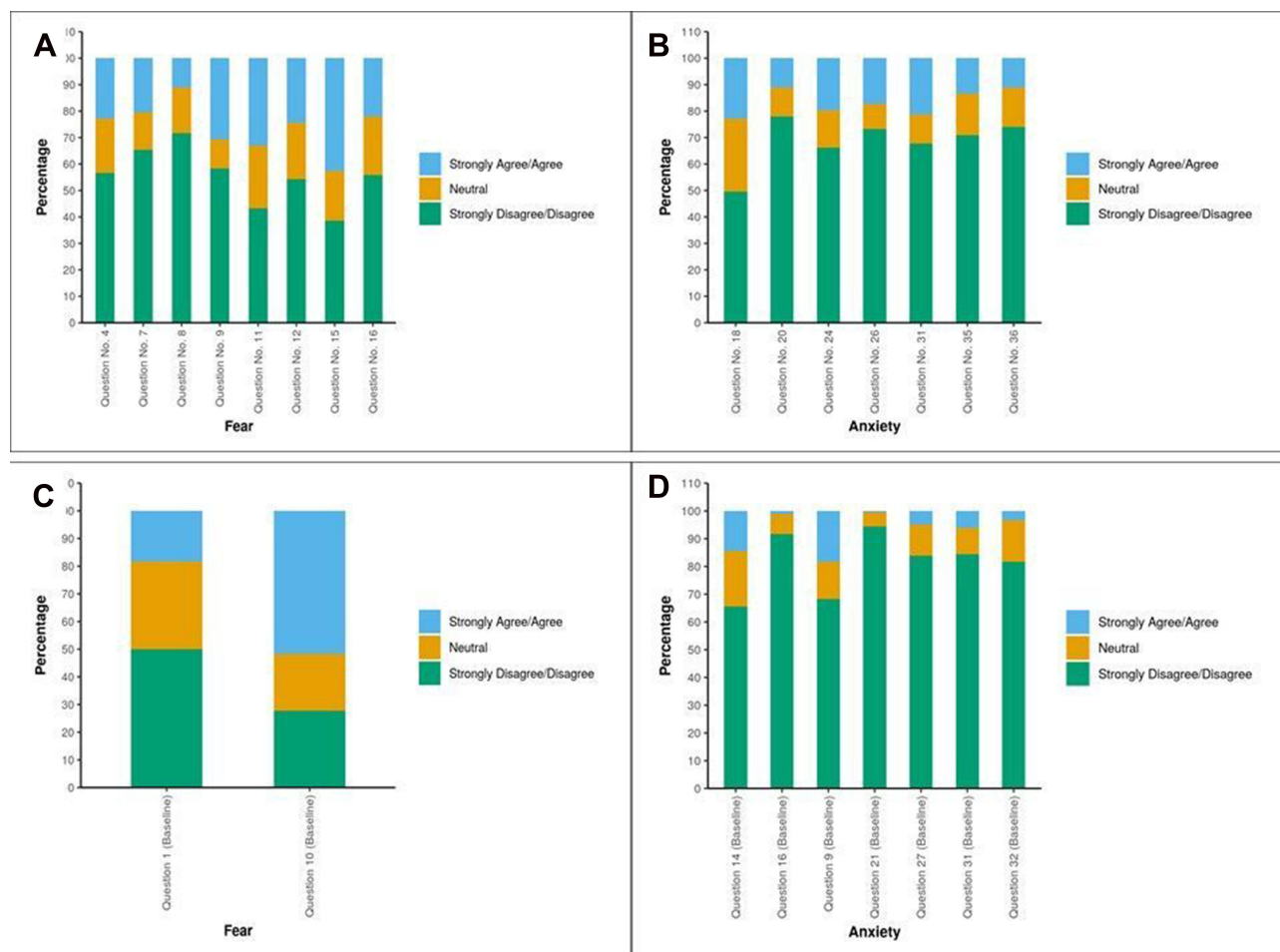


Figure 1 Multibar diagrams representing the responses to various questions: assessing fear in a patient (A) and healthcare worker (C) population, anxiety in a patient (B) and healthcare worker (D) population.

experienced dryness of their mouth, felt scared for no reason, and were close to panic.

Stress

HCWs with acute respiratory symptoms reported significant inability to cope with things and were unable to control their irritability (Figure 2C). HCWs working in COVID-19 positive/suspect wards felt they were using a lot of nervous energy and found themselves getting agitated. Among the various categories of HCWs, nurses had the highest incidence of feeling rather touchy, while professors had the least. Residents reported feeling a lot of anger when things were out of control. Some positivity and optimism were noted among HCWs who felt they were following all necessary precautions, and they felt things were going their way during the pandemic, while HCWs who reported not following precautions found it difficult to control their irritabilities in life. Those who

were not sure if they were taking steps to prevent it often felt angered about things being out of their control. Female HCWs had a higher proportion of feeling hard to relax juxtaposed to their male counterparts. HCWs with a history of contact with a positive case had a higher incidence of feeling agitated, touchy, nervous, and stressed, and communicated with difficulty in trying to wind down. Among those with a history of contact, higher levels of stress were observed among HCWs who developed upper respiratory tract symptoms after exposure.

Depression

A higher tendency of depression was observed in HCWs posted in COVID-19-positive/suspect areas or with history contact with a positive/suspected case, as they described feeling downhearted and blue with a lack of enthusiasm and having nothing to look forward to (Figure 2D). Of interest, those with no history of exposure to positive cases had a higher

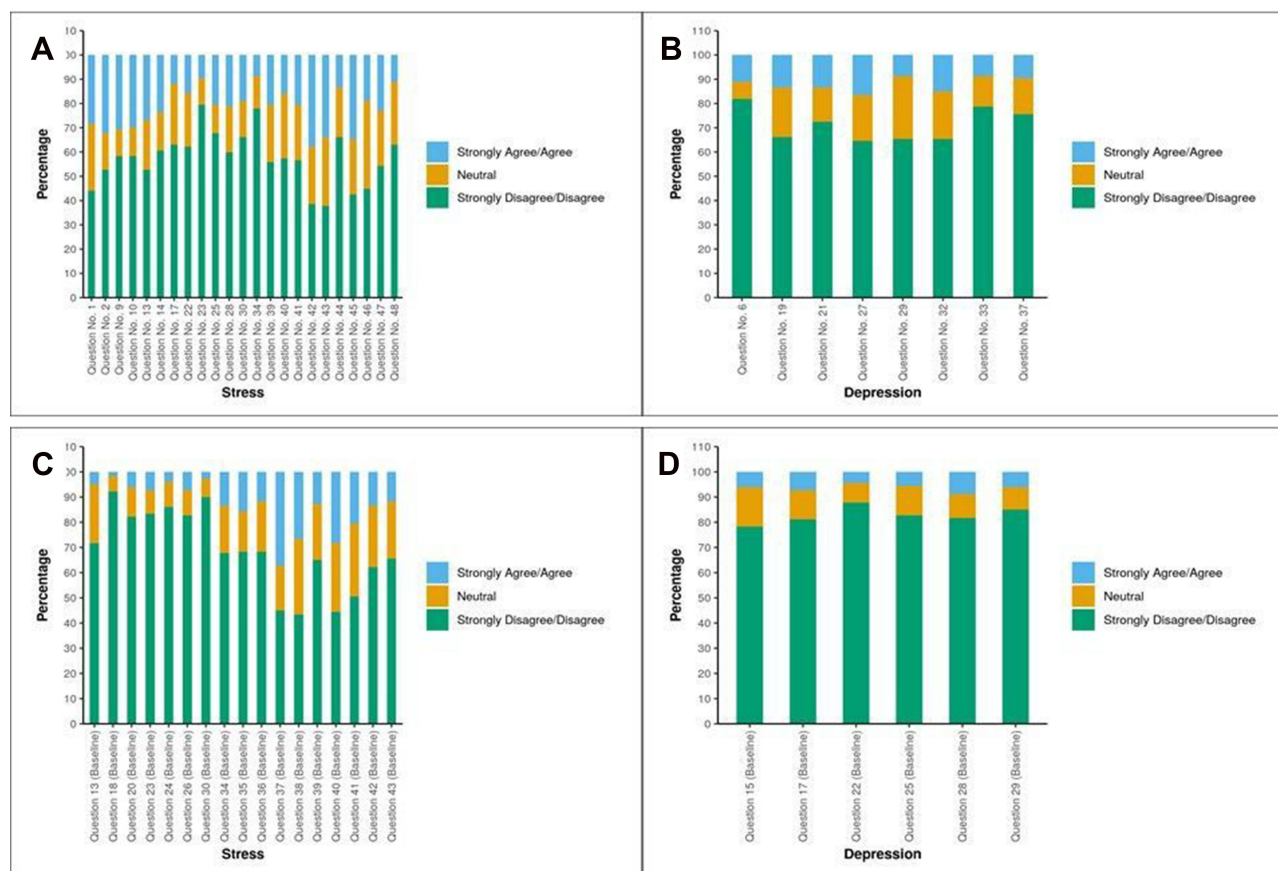


Figure 2 Multibar diagrams representing the responses to various questions: assessing stress in a patient (A) and healthcare worker (C) population, depression in a patient (B) and healthcare worker (D) population.

proportion of being unable to experience any positive feeling at all. A greater incidence of lack of enthusiasm was prevalent among male HCWs compared to their female counterparts.

Healthcare Workers (Follow-Up)

Although a large number of HCWs denied feeling depressed as a result of social abandonment and had less trouble relaxing than at the time of the first contact, no statistically significant variations in reaction to other psychological health criteria were observed.

Discussion

In our research, we discovered that fear was higher among people who had no previous travel background, and the general public was afraid of catching the disease from healthcare workers and vice versa. The fear of death was found to be higher in the 51–60 age group, while nightmares were found to be higher in the 41–50 age group than the other age groups.

HCWs with respiratory symptoms or those working in the COVID-19 ward found it particularly difficult to wind down, which caused great uncertainty and stigmatization for both staff and patients.¹⁷ 18.3% of people were afraid of developing COVID-19 infection. Around half of the HCWs said they were afraid of spreading the infection to their families and loved ones. Previous studies of hospital employees who may have been exposed to SARS discovered that they were quarantined and found to show the most predictive signs of acute stress disorder soon after the quarantine period ended. Quarantined employees were more likely to report weariness, alienation from others, worry while dealing with feverish patients, and irritation in the same study.¹⁸ Similarly, in our study, anxiety was higher among those who were quarantined at home, with the most common symptoms being shortness of breath, even when not exerted, and dry mouth. The isolated and home quarantine populations had higher stress levels, manifesting as a proclivity to overreact, failure to regulate emotions, nervousness, and trouble

Table 2 Descriptive Characteristics of Health Care Worker Population

Parameters	Frequency (%)
Age (Years)	
21–30	141 (78.3%)
31–40	36 (20.0%)
41–50	3 (1.7%)
Gender	
Male	119 (66.1%)
Female	61 (33.9%)
Designation	
Resident	149 (82.8%)
Nurse	18 (10.0%)
Professor	11 (6.1%)
Fellows	1 (0.6%)
PhD Scholar	1 (0.6%)
Area of Work	
COVID	54 (30.0%)
NON-COVID	126 (70.0%)
Caring for COVID Confirmed Cases	
Yes	28 (15.6%)
No	136 (75.6%)
Maybe	16 (8.9%)
Following All Precautions	
Yes	139 (77.2%)
No	35 (19.4%)
Maybe	6 (3.3%)
Acute respiratory infection Symptoms After Contact	
Yes	8 (4.4%)
No	165 (91.7%)
Maybe	7 (3.9%)
Close Contact with COVID-19 Positive Case (Yes)	39 (21.7%)
History of Travel (Yes)	8 (4.4%)

dealing with everyday life. Nurses were the most stressed, while professors were found to be the least stressed. Female HCWs had a harder coping time than their male counterparts. Male HCWs were found to have a higher rate of lack of enthusiasm than their female counterparts. HCWs who worked in COVID-19 designated wards reported higher stress, depression, and anxiety compared to their counterparts. HCWs who had previous contact with a COVID positive/suspected case reported dry mouth, feeling frightened for no apparent cause, and being on the verge of panic.

The symptoms of posttraumatic stress disorder (PTSD) and depression were observed in 28.9% and 31.2% of respondents, respectively. In a previous study conducted during the SARS pandemic, more extended quarantine periods were linked to an increased incidence of PTSD symptoms.¹⁹ In contrast, in our study, a history of travel or unemployment was found to be substantially correlated with these factors. The agitation parameter was highest in March and June 2020, that is, in the early months of the pandemic. The depression parameter was highest in June 2020 and was linked to feelings of worthlessness and blueness among the respondents, in contrast to a study where—higher levels of depression were during the first few weeks of the outbreak and the initial lockdown period, in March–April.²⁰ These results can also be linked to post-SARS 2003 outbreak findings, which showed that among SARS survivors, the prevalence of post-recovery likely or clinician-diagnosed anxiety disorder, depressive disorder, and posttraumatic stress disorder was 19%, 20%, and 28%, respectively.²¹ These findings contrast with those of a similar report on HCWs and the psychological effects of the SARS 2003 pandemic, which discovered that high-risk HCWs had elevated stress levels. Despite their trust in infection-control measures, more high-risk HCWs recorded exhaustion, poor sleep, concern about health, and fear of social interaction, which were not significantly different from levels in low-risk HCWs control subjects.²²

A series of previous studies regarding the mental health impact of infectious disease pandemics and outbreaks have been conducted, with the majority being during the SARS and influenza pandemics of 2003 and 2009, respectively.²³ One of these found an extensive range in prevalence rates of mental health problems, such as anxiety, depression, posttraumatic stress symptoms, or disorders, might be especially prominent among HCWs and survivors who are directly affected by epidemics and face a real threat of infection and difficult circumstances such as isolation/quarantine or difficult working conditions.²⁴ Another study illustrated that a novel deadly infectious disease, such as SARS, could cause significant prolonged psychiatric problems.²⁵ It has also been found that during the outbreak, SARS survivors among HCWs had stress levels similar to those of non-HCWs; however, HCWs showed significantly higher stress levels in 2004 and had higher depression, anxiety, posttraumatic symptoms, and GHQ-12 scores.²⁶ A similar study conducted again during the SARS pandemic found that HCWs reported significantly more positive and more negative psychological effects

from SARS than control subjects. HCWs declared confidence in infection-control measures.²⁷ Healthcare workers who were quarantined exhibited considerably more severe symptoms of posttraumatic stress than members of the general public who were quarantined in every dimension. In a previous study, workers in the healthcare industry also reported feeling more stressed, demonstrating more stigmatization than the general public.²⁸ After quarantine, avoidance behaviours were reported to be more prevalent. On the other hand, in our study, looking at the patients' side, another previous study found that general stress and adverse psychological effects are increased in SARS patients, particularly among infected HCWs.²⁹

Efficient preparation and support, the creation of material and emotional reserves, effective leadership, and measures to ensure the well-being of HCWs and their families will be significant motivators to come to work.^{29,30} Before SARS or another virulent disease breaks out, it is essential to think about how to better help HCWs through timely knowledge exchange, proper infection prevention protocols, income protection during outbreaks, risk management for family members, minimizing disruptions to other clinical services, and the degree of psychosocial distress. In the case of a COVID-19 (SARS-CoV2) pandemic, this could help to reduce staff absenteeism and, as a result, hospital services would be less disrupted. They suggest that psychological services could be necessary in the rehabilitation phase and should not be forgotten as we face an evolving new outbreak of the COVID-19 virus. Our results highlight the need to enhance HCWs' preparedness and competence in detecting and managing the psychological sequelae of future comparable infectious disease outbreaks. It has also been shown that higher PTSD-like symptoms in both the HCWs and COVID-19 survivor populations are prevalent. The risk factor analysis can improve the detection of undiagnosed psychiatric complications and provide insight into a possible model of care delivery for COVID-19 survivors.

This study is limited by collecting data over a long duration of time, and the varying trends of the pandemic over the months may have caused a variation in psychological perception among the participants. Also, there was attrition, mental fearness, and many participants were lost to follow-up, resulting in a small sample size that prohibits generalization of the results in the entire population. The use of self-reported questionnaires for fear and anxiety aspects may also be considered

a drawback compared to clinician-diagnosed psychological sequelae. However, the results provide important insights for policymakers and healthcare professionals involved in clinical work and hospital administration around the world while delineating the psychological sequelae of life-threatening and fatal infectious disease outbreaks. It is imperative to understand that a pandemic is bound to have long-term psychiatric sequelae, and our work does not end with the subsidence of the pandemic. The psychological sequelae may appear further with a delay as delayed complications of COVID-19 are yet to be recognized and understood.

Conclusion

Our study suggests that all the parameters ranging from fear, anxiety, stress, and depression were significantly higher than those experienced during the SARS 2003 outbreak, thus emphasizing the psychological aspects of the COVID-19 pandemic. The psychological impact of COVID-19 pandemic was widespread in patients as well as HCW population with significant degrees of fear, anxiety, stress and depression in both the groups. These results emphasize a need for solid preparedness and readiness to counter the ongoing and any future pandemics on mental beings. Our results also suggest a significant psychological impact on both patient and HCW populations, thus warranting adequate prevention measures and ample psychological support for these population groups. There is an immense amount of further research and studies required in these domains in the future to obtain complete facts around the pivotal aspects of the mental impact of any pandemics in history and the future.

Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki.

Acknowledgments

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Disclosure

The authors report no conflicts of interest in this work.

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