Psychosocial Impact of COVID-19 on Healthcare Workers at a Tertiary Care Cardiac Center of Karachi Pakistan

Dileep Kumar, FCPS, Tahir Saghir, FCPS, FSCAI, Gulzar Ali, FCPS, Umamah Yasin, MBBS, Shumaila Furnaz, MSc, Musa Karim, MSc, Muhammad Hussain, FCPS, Rekha Kumari, MBBS, Reeta Bai, MBBS, and Hitesh Kumar, MBBS

Objectives: Aim of this study was to determine the depression, stress, and anxiety level among healthcare workers working at a tertiary care cardiac center of Karachi Pakistan during COVID-19 pandemic. **Methods:** This survey was conducted at the National Institute of Cardiovascular Disease (NICVD), Karachi, Pakistan. Participants of the study were fulltime employees of hospital. Data were collected using an online questionnaire and Depression, Anxiety and Stress - 21 (DASS-21) scale was used. **Results:** A total of 224 healthcare workers were included, 46 (20.5%) participants were screened for moderate to severe depression, 20.1% (45) for moderate to severe anxiety, and 14.7% (33) for moderate to severe stress. **Conclusion:** A significant levels of depression, anxiety, and stress were noted with the major concerns of workplace exposure, increased risk of infection, and transmission to their families and friends.

Keywords: anxiety, COVID-19, depression, healthcare workers, pandemic, psychosocial, stress

W orld is facing Coronavirus disease (COVID-19) pandemic since December 2019 when the first case of COVID-19 was reported in Wuhan, China.[1,2] Soon after the rapid spread of disease to the other parts of the world, the World Health Organization (WHO) had to declare COVID-19 as global pandemic.[3] According to worldometer, as of August 7, 2020, the COVID-19 outbreak affected 213 countries around the world, including Pakistan, with 19,363,217 cases and death toll of 719,633 with the death rate of 5%.[4] The first confirmed case of COVID-19 in Pakistan was reported on February 26, 2020,[5] according to the COVID-19 health advisory platform by Ministry of National Health Services Pakistan, as of today (August 7, 2020) the total confirm cases in Pakistan are 282,645 with the death toll of 6052 (2.1%).[6]

COVID-19 pandemic has caused an unprecedented scenario not only for the masses but also for the healthcare workers around the globe. Following the footsteps of Chines response to the COVID-19 outbreak, social distancing measures such as national level lockdowns and restricted mobility of the masses are implemented by the governments of all the affected nations in order to limit the human to human transmission and spread of the infection.[7] However, world is yet to experience the looming financial, political, and socio-psychological impacts of the pandemic.[8] This pandemic is expected to be even direr in low- and middle-income countries, such as Pakistan, with struggling economies and poor health care infrastructures.[9] These critical situations have most affected the frontline healthcare workers who are vulnerable to get infected due to close proximity and direct contact with the suspected patients. Moreover, disrupted lifestyle, prolonged working hours, discomfort of the prolonged donning of the personal protective equipment (PPE), continuous fear of exposure, commute to workplaces during lockdown, and isolation/quarantine and limited interaction with friends and families has significant morale and psychosocial impact on the healthcare workers.[10]

Anxiety and depression among healthcare professionals is a common feature of epidemics, such as SARS and H1N1 epidemics and now COVID-19.[11-15] A high incidence of stress and anxiety disorders have been reported among healthcare professionals working in a tertiary care hospital dealing COVID-19 patients.[13] Although, our center is a cardiac care center and not designated center for the management of COVID-19 patients, but cardiac emergency room was operational for cardiac emergency admission during the COVID-19 pandemic and an isolated ward was admitting COVID-19 patients with underlying cardiac diseases. Therefore, aim of this study was to determine the depression, stress, and anxiety level among frontline healthcare workers during COVID-19 pandemic at a tertiary care cardiac center of Karachi Pakistan.

METHODS

This study was conducted at the National Institute of Cardiovascular Disease (NICVD), Karachi, Pakistan, the largest tertiary care cardiac center of the country, from July 1, 2020 to July 20, 2020. Participants of the study were fulltime employees of hospital including consultants, physicians, nursing staff, allied health care professionals, technicians, administrators, and clerical staff who were actively performing their duties during COVID-19 pandemic and were directly or indirectly exposed to the suspected COVID-19 patients with underlying cardiovascular diseases and their attendants. Employees of either sex between 18 and 65 years of age without any pre-existing psychiatric illness were included in this study.

Data were collected using an online questionnaire formed on Google Forms which consisted of two sections, demographic and depression, anxiety, and stress assessment section. Demographic section comprises of age (years), sex, marital status, occupation, education, area/department of work, comorbid conditions, whether participant self and any of his family members tested positive for COVID-19, exposure to the COVID-19 suspected patients during work hours, and general reasons of concern during COVID-19 pandemic. Depression, anxiety, and stress were assessed using the 21 items Depression, Anxiety and Stress - 21 (DASS-21) scale by the Psychology Foundation of Australia.

Considering the varying degree of education level of the participants the Urdu (national language of Pakistan) version of the questionnaire available from the DASS website (http://www2.psy.unsw.edu.au/dass/Urdu/Aslam.htm) was used in this study. DASS-21 is a shorter version of basic 42-item questionnaire which comprises of seven item each for depression, anxiety, and stress

TABLE 1. Demographic Profile, Pre-existing Comorbid Conditions, and COVID-19 Exposure of the Participants

Characteristics	Total
Total (*N*)	224
Gender	
Male	75.9% (170)
Female	24.1% (54)
Age, yrs	32 [29−35]
≤35	79% (177)
>35	21% (47)
Marital status	
Single	37.9% (85)
Married	62.1% (139)
Education	
Under graduate	10.7% (24)
Graduation	41.1% (92)
Masters	22.3% (50)
Post-graduation	25.9% (58)
Occupation	
Allied healthcare professionals	79.5% (178)
Nursing staff	15.2% (34)
Other	5.4% (12)
Comorbid conditions	
Diabetes mellitus	4.5% (10)
Hypertension	6.7% (15)
Asthma/COPD	5.4% (12)
Ischemic heart disease	1.8% (4)
Smoking	11.2% (25)
Hypothyroidism	1.3% (3)
COVID-19 exposure	
Any family member tested positive for COVID-19	25.4% (57)
Exposed to COVID-19 suspected patients at work	87.9% (197)
Participant is tested positive for COVID-19	14.3% (32)

COVID-19, Coronavirus disease; COPD, chronic obstructive pulmonary disease.

and each item is four point rating scale (0 to 3) indicating how much statement applies to the respondent over the past 1 week from "did not apply at all" to "applied very much." The computed score (sum of rating) for each domain was multiplied by two to compute the final score and severity was categorized based on the cut-off scores values recommended in the manual for the DASS.

Collected data were analyzed using IBM SPSS Statistics for Windows, Version 21.0. (IBM Corp., Armonk, NY). Normality of the distribution of age (years), depression, anxiety, and stress scores were assessed by applying Shapiro−Wilk test and *P*-value of the test were <0.05 hence median and interquartile range (IQR) were computed and Mann−Whitney *U* test was applied to compare the scores by various groups and subgroups of participants. Categorical variables were expressed as frequency (%) and Chi-square tests were applied to assess the association of depression, anxiety, and stress level by various groups and subgroups of participants. The level of significance was set at less than or equal to 0.05 throughout the analysis.

RESULTS

A total of 224 hospital workers were included in this survey, 75.9% (170) of them were male participants and majority of the participants were under the age of 35 years (79%) and married (62.1%). Only 10.7% (24) were under graduates and 79.5% (178) of the participants were allied healthcare professionals. A majority of the participants (87.9%) were directly or indirectly exposed to the COVID-19 suspected patients at workplace, 25.4% (57) of the participants had at least one family member tested positive for COVID-19, and 14.3% (32) of the participants were tested positive for COVID-19 and recovered. Demographic profile, pre-existing comorbid conditions, and COVID-19 exposure are presented in Table 1.

The DASS-21 has good internal consistency for all three domains with the Cronbach α coefficient of 0.834 for depression, 0.761 for anxiety, and 0.850 for stress scale. The median depression score was 6 [IQR: 2 to 12] with 6.7% (15) fall under the severe depression categorized and 25.4% (57) with mild to moderate depression. The anxiety score was 4 [IQR: 0 to 8] with 7.6% (17) had severe and 20.1% (45) with mild to moderate anxiety. Similarly, stress score was 10 [IQR: 4 to 16] with 4.9% (11) and 21.4% (48) of the participants with severe and mild to moderate stress. Anxiety and stress levels were found to be comparatively higher among participants who were tested

TABLE 2. Depression, Anxiety, and Stress Levels Stratified by the COVID-19 Status of the Participant

| DASS-21 | Total | COVID-19 | | *P*-Value |
		Negative	Positive	
Total (*N*)	224	192	32	−
Depression				
Depression score	6 [2−12]	6 [2−11]	7 [2−15]	0.333
Normal (0−9)	67.9% (152)	68.8% (132)	62.5% (20)	0.148
Mild (10−13)	11.6% (26)	12.5% (24)	6.3% (2)	
Moderate (14−20)	13.8% (31)	13% (25)	18.8% (6)	
Severe (21−27)	4.9% (11)	3.6% (7)	12.5% (4)	
Extremely severe (28+)	1.8% (4)	2.1% (4)	0% (0)	
Anxiety				
Anxiety score	4 [0−8]	4 [0−8]	6 [2−11]	0.011*
Normal (0−7)	72.3% (162)	74.5% (143)	59.4% (19)	0.004*
Mild (8−9)	7.6% (17)	7.3% (14)	9.4% (3)	
Moderate (10−14)	12.5% (28)	12% (23)	15.6% (5)	
Severe (15−19)	3.6% (8)	4.2% (8)	0% (0)	
Extremely severe (20+)	4% (9)	2.1% (4)	15.6% (5)	
Stress				
Stress score	10 [4−16]	10 [4−14]	12 [6−22]	0.083
Normal (0−14)	73.7% (165)	76% (146)	59.4% (19)	0.001*
Mild (15−18)	11.6% (26)	12.5% (24)	6.3% (2)	
Moderate (19−25)	9.8% (22)	6.3% (12)	31.3% (10)	
Severe (26−33)	4.5% (10)	4.7% (9)	3.1% (1)	
Extremely Severe (34+)	0.4% (1)	0.5% (1)	0% (0)	

COVID-19, Coronavirus disease; DASS-21, Depression, Anxiety and Stress - 21 (DASS-21) scale.
*Significant at 5%.

TABLE 3. Odds of Participants been Screened Positive for Severe Depression, Anxiety, and Stress Score With Demographic Characteristics and Pre-existing Comorbid Conditions

Characteristics	Severe Depression		Severe Anxiety		Severe Stress	
	OR [95% CI]	*P*-Value	OR [95% CI]	*P*-Value	OR [95% CI]	*P*-Value
Male	0.9 [0.3–2.8]	0.811	0.7 [0.2–2.2]	0.596	0.8 [0.2–3.3]	0.801
Age >35 years	4 [0.5–30.8]	0.190	0.9 [0.3–2.7]	0.789	2.8 [0.3–22.1]	0.340
Married	0.5 [0.2–1.5]	0.210	0.7 [0.2–1.8]	0.423	0.7 [0.2–2.4]	0.600
Masters/post-graduation	0.7 [0.2–2]	0.512	0.6 [0.2–1.6]	0.273	0.6 [0.2–2.1]	0.424
Allied health care professional	1 [0.3–3.8]	0.958	1.2 [0.3–4.5]	0.759	2.7 [0.3–21.5]	0.354
Family member tested positive for COVID-19	1.5 [0.5–4.6]	0.470	1.2 [0.4–3.7]	0.697	1.1 [0.3–4.3]	0.887
Participant is tested positive for COVID-19	2.4 [0.7–7.9]	0.167	2.8 [0.9–8.5]	0.074	0.6 [0.1–4.7]	0.618
Diabetic	1.6 [0.2–13.4]	0.672	1.4 [0.2–11.5]	0.769	–	–
Hypertensive	2.3 [0.5–11.4]	0.300	3.5 [0.9–13.8]	0.076	–	–
Asthma/COPD	3.1 [0.6–15.4]	0.175	2.6 [0.5–13.1]	0.239	1.8 [0.2–15.7]	0.578
Ischemic heart disease	4.9 [0.5–50.3]	0.180	4.2 [0.4–43.2]	0.222	–	–
Smoking	3.3 [1–11.1]	0.060	1.8 [0.5–6.8]	0.383	3.3 [0.8–13.2]	0.098

CI, confidence interval; COVID-19, Coronavirus disease; COPD, chronic obstructive pulmonary disease; DASS-21, Depression, Anxiety and Stress - 21 (DASS-21) scale; OR, odds ratio.
*Significant at 5%.

positive for COVID-19. Depression, anxiety, and stress levels stratified by the COVID-19 status of the participant are presented in Table 2.

Odds of participants been screened positive for severe depression, anxiety, and stress with demographic characteristics and pre-existing comorbid conditions are presented in Table 3. Anxiety score was significantly higher among healthcare workers who were directly or indirectly exposed to COVID-19 suspected patients at work (4 [2–8] vs 2 [0–4]; $P < 0.001$). However, odds of participants been screened positive for depression, anxiety, and stress was not found to be associated with either demographic characteristics or pre-existing comorbid conditions.

When asked for reasons of concern during COVID-19 pandemic, 41.1% (92) of the participants showed their concerns regarding safety of their families, 40.6% (91) were concerned about getting infected and workplace exposure, 9.4% (21) were due to disrupted professional and personal life, and 6.3% (14) raised their concern regarding lake of safety equipment. Other concerns mentioned by the healthcare workers were regarding general public not following SOPs (3.1%), economic instability (2.2%), lake of treatment options and vaccinations (2.2%), uncertain situation (2.2%), and misconception and negative image of doctors in community (1.3%).

DISCUSSION

Psychosocial response of the healthcare workers during pandemics like COVID-19 is multifold, various factors come to play including the highly contagious nature of infection itself, workplace exposure and continuous risk of getting infected and transmitting to family and loved ones, uncertainty and lack of control over the diseases progression due to lack of treatment options and vaccinations, prolonged working hours and disrupted professional and personal life, extreme precautions and fatigue due to PPE, lack of clear communication of directives, and lack of social support due to isolation and social distancing.[16–19] Similar to what been observed, during this pandemic workplace exposure and fear of getting infected and transmitting to the family and friends were the major concerns among the participants of this study. A significant number of participants were screened for moderate to severe stress (14.7%), depression (20.5%), and anxiety (20.1%).

Moderate to severe stress, anxiety, and depression among the healthcare professionals working in the COVID-19 isolation ward of the various designated hospitals of Pakistan is reported to be 90.1%, 85.7%, and 72.3%.[18] Which were much higher than the levels reported in our study. The differences in results can be partly explained by the fact that our center is not a primarily designated hospital for the COVID-19 patients, it only caters COVID-19 patients with underlying cardiac diseases. Hence, the burden of COVID-19 patients as well as associated level of risk is low for our center as compared with the hospitals designated for the COVID-19 patients. Another study from the Wuhan China, the origin of diseases, also reported depression, anxiety, insomnia, and distress in 50.4%, 44.6%, 34%, and 71.5% respectively among the healthcare professions dealing in COVID-19 patients.[16]

Every epidemic draw a unique response from the healthcare system, psychological impact of pandemic is much higher for the healthcare workers who had firsthand experience of the extent of the disease, from its sign and symptoms to the isolation to the recovery phases. Healthcare workers who were diagnosed positive for the COVID-19 had higher moderate to severe depression (31.3% vs 18.8%), anxiety (31.3% vs 18.2%), and stress (34.4% vs 11.5%). Although, global communities have appraised the efforts of healthcare workers during these critical situations and shown empathy and compassion.[20] But it is also important to understand the underlying sources of fear and anxiety among the healthcare workers that can potentially weaken self-confidence to reassure the public and ability to stay calm when it is most needed.[21]

CONCLUSION

A significant levels of depression, anxiety, and stress were noted among the healthcare worker performing their duties during COVID-19 pandemic. The major concerns were workplace exposure, increased risk of infection, and transmission to their families and friends. Under these extraordinarily difficult circumstances, it is responsibility of the organizations and leadership to recognize the concerns with efforts to support, facilitate, and protect healthcare workers and their families.

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