

Mental Health Status among Healthcare Workers during COVID-19 Pandemic

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Abstract

Objective: COVID-19, which is an international concern by far, had fundamental impacts on mental health of medical staff. Healthcare workers are the high-risk group to endure the emotional outcomes brought about by the outbreak. This study assesses the mental consequences of healthcare workers during the acute phase of COVID-19 pandemic in Tehran.

Method: We conducted a cross-sectional study on healthcare workers from two tertiary referral hospitals in Tehran province. A total of 222 of the staff participated in the study. Our questionnaires comprised Impact of Event Scale-Revised (IES-R) and 12-item General Health Questionnaire (GHQ-12), which were handed to participants to obtain data on their general mental problems in addition to the psychological impacts of the evolving virus on this particular group. Epidemiologic and sociodemographic information of participants, level of perceiving exposure to disease, and underlying diseases of each of them were gathered during the recruitment period.

Results: Results showed high probabilities (98.2%) in mental disorders among healthcare workers. Since our study was done during the initial phase of the pandemic, development of mental issues due to the newly emerged infectious virus was expected. However, we recorded mild (41.4%) to moderate (31.5%) impact of this novel virus. The possibility of having mental problems was much higher in females, assistant nurses, individuals with lower education, and those who provided care for COVID-19 patients.

Conclusion: COVID-19 has brought about increased distress among healthcare workers. Noticeably, the forefront group in combating this virus bear the most emotional complications. Thus, efforts should be taken into practice to provide proper psychological support for this vulnerable group.

Key words: COVID-19; Coronavirus; Healthcare Worker; Mental Health; Pandemic; SARS-CoV-2

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The COVID-19 virus is a respiratory infectious pathogen that emerged in December 2019 in Wuhan, China, and was announced by the World Health Organization “WHO” as a pandemic on March 2020, as over 110 countries and territories across the globe were affected (1). The current state is now assumed as a deadly crisis during which the early identification and the isolation of suspected cases were urgently adapted (2).

Healthcare workers generally expressed feelings of extreme pressure due to the advent of the virus (3); they are greatly prone to stress and professional burnout because they are responsible for human lives. In particular, the ones working in stressful environments, such as COVID-19 appointed wards, are distinctly more susceptible to exhibit maladaptive behaviors (4). The current situation has some parallels with previous outbreaks in terms of communicable diseases, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) (5), (6). A study conducted in Saudi Arabia to investigate the stressors among healthcare workers who worked in high-risk areas cited that there were some emotions centered on fear of their own health and that of their colleagues and families (7). The general health questionnaire was used in Hong Kong to evaluate psychological morbidity in frontline healthcare workers; their results pointed out that 68% of them reported high level of stress mostly because of their perceptions of personal vulnerability (8). The insufficient number of respirators in medical units amplifies the staggering settings, which develops intricate conditions for healthcare workers to make impossible decisions upon severely sick patients (9). This virus is evolving over time while there are no approved therapeutic or preventive treatments so far, and all these factors in addition to the escalating mortality rate pertained to COVID-19 are responsible for the growing obstacles in the relationship between healthcare workers and COVID-19 patients as well as their family members. Furthermore, this aggravates the standards of care delivered to patients. The psychological status of medical staff directly influences the quality of medical service handed to patients (10). Additionally, the fact that healthcare workers who are involved in curing lethal illness might become victims themselves generated an overwhelming level of fear (11). Some may be avoided by their family members and their communities owing to the stigmatization of the disease (12).

The psychological effects on medical and nurse staff is presumed yet to be established; therefore, observing their mental health should be a priority for health managers. Since working hours is overloaded, authorities must allocate financial provisions for the healthcare staff (9).

It is important to identify and support healthcare workers who are struggling in the context of the pandemic. Thus, studies as essential as this article are fundamental for

evaluating the mental consequences of this notorious phenomenon on the frontline healthcare personnel. The data extracted from such examinations could avail health authorities to address the mental outcomes of the virus prevailing in this certain group. Furthermore, practical consolation programs should be administered aimed at alleviating the psychological inconveniences.

Likewise, in Iran the medical staff are encountering same issues. The numbers admitted to hospitals are rising day by day; and as a result, negative psychological responses are progressing over time. Therefore, recognition of mental health problems faced by healthcare workers is of high importance.

We intended to appraise the psychological effects and mental health status of healthcare workers in the dire times of COVID-19 pandemic. The associated factors were also investigated.

Materials and Methods

Self-administered questionnaires were given to healthcare professionals. A total of 228 of healthcare workers agreed to participate in our study and completed the surveys. A total of 222 participants were responsive and returned the questionnaires. The inclusion criteria for the study were being a staff providing care in the fever line designated unit for COVID-19 patients. Sampling was random and questionnaires were given to the participants, regardless of their position or rank. Data were gathered at two tertiary referral hospitals of Shahid Beheshti University of Medical Sciences: Taleghani and Labbafinejad hospitals that were willing to assist in COVID-19 research. Epidemiological and sociodemographic data of participants were self-registered anonymously. The data collection tools were the Persian version of Weiss and Marmar’s Impact of Event Scale- Revised (IES-R) and the 12-item general health questionnaire (GHQ-12).

The enrollment was established with the help of medical students and physicians who helped us to gather the data. This study was approval at the Iranian Institutional Research Committee (ID: IR.SBMU.RETECH.REC.1399.169).

The Demographic Information Questionnaire

The demographics information questionnaire was devised by the researcher and expert professors. The demographic characteristics included age, gender, occupational level, educational degree, marital status, any physical or mental diseases, living conditions (whether alone or with family members), years of work experience, level of perceptions of exposure to disease, and if they were taking care of COVID-19 patients.

Impact of Event Scale-Revised (IESR)

We used the Persian version of the original Weiss and Marmar Impact of Event Scale-Revised (IES-R) (13), which was found to be very valuable as a screening instrument for PTSD (14). Translation of such measurements is influenced by culture and transcultural consideration is essential to ensure content validity (15). The Persian version of IES-R has good internal

consistency (α Cronbach = 0.67-0.87) and test-retest reliability ($r = 0.8-0.98$, $P < 0.01$) and also good convergent validity (16). The 22-self reported modified items of IES-R were administered. The symptoms associated with PTSD following a traumatic life event and persistent negative emotions were measured, with 1 = not at all, 2 = rarely, 3 = sometimes, and 4 = often, with higher scores indicating more stressful impact. There were 3 subscales in the questionnaire: intrusion, avoidance, and hyperarousal. In accordance with the recommendations given by the original authors of this version of IES-R, the responses are divided into 3 subgroups of mild, moderate, and severe impact, with scores higher than 44 reflecting severe impact.

12- Item General Health Questionnaire (GHQ-12)

We measured the incidence of mental disorders among healthcare workers using the 12-item general health questionnaire, which is the most extensively used screening instrument for common mental disorders. GHQ-12 is intended to screen for general (nonpsychotic) psychiatric morbidity (17). It has been widely used and translated into many languages and extensively validated in general and clinical populations worldwide (18). It has been analyzed in different age groups and it has been affirmed that GHQ-12 can be used effectively to assess psychological well-being (19). Its validity and reliability were also tested in Iran (20). This self-administered questionnaire is designed for busy and stressful clinical settings and for individuals who encounter sudden tensions (18).

Scores equal to 18 showed high probability; therefore, the participants who had higher scores were more likely to have a mental disorder and consequently needed more mental support

Data Analysis

The completed questionnaires were then converted into numbers and statistics for analysis. Data were analyzed using SPSS version 26. Descriptive analysis was performed to detect differences in psychological problems among sociodemographic independent variables using Pearson's chi-square. P values concerning each demographic variable in addition to Pearson chi square were calculated. For a chi-square test, a P value less than 0.05 indicated a relationship between the categorical variables.

Results

Demographics

The response rate in all the collected surveys was 97%. Most participants aged 30 to 40 years and only a few were older than 50 years. Female personnel were more than males (females = 65.8%; males = 34.2%). Most of participants had a bachelor's degree ($n = 115$; 50.4%) and a small number of participants were undereducated ($n = 12$; 5.3%). There were 24 service personnel (10.5%), 30 practical nurses (13.21%), and 138 assistant nurses (60.3%). Thirty doctors participated in our study.

We had 1 faculty member, and 216 were government employees who had a greater population compared to private employees (5.3%). Also, 32 had less than 2 years of working experience in the field, and almost half the sample had over 10 years of work experience. Most participants were married (146) and lived with their family members (202). Predominantly, the majority of the hospital workers were exposed to COVID-19 patients. Almost half of the total staff were caregivers for COVID-19 patients. 11 had history of psychiatric illness (4.8%). Largely they expressed high exposure to COVID-19 ($n = 174$; 76.3%) (Table 1). Approximately all of them had at least 1 common underlying disease that were mostly reported as gastrointestinal disorders ($n = 21$; 92%), followed by dermatology problems, hyperlipidemia respiratory disease, and hypertension, respectively (Table 2).

IES-R and GHQ-12 Results

Overall, low and moderate rates of posttraumatic distress were noted (41.4% & 31.5%, respectively) and almost 27% of all staff reported severe impact (Table 1).

There were no associations between age and helplessness due to the pandemic. In general, level of education had a significant association with PTSD symptoms, with a P value of 0.02. Those with doctoral or postdoctoral educational degrees reported mild rates of distress ($n = 22$; 91%-9.9%) and those who were undereducated exhibited the most PTSD-related behaviors ($n = 10$; 83%-4.4%). We observed a steady increase in the level of distress within the education subgroups from the highly educated to those with lowest education levels.

Occupation was a relevant variable to PTSD symptoms and it was statistically significant ($P = 0.03$). Our faculty member showed a low level of posttraumatic stress. Distress was mild to moderate ($n = 33$; 94%-14.8%) among doctors. We recorded the highest impact of event among practical nurses ($n = 21$; 72%-9.4%). The documented scores of their GHQ-12 were also high, all of whom reported moderate to high probability of psychological disorders. Assistant nurses who were somewhat the majority of the participants in terms of position title, reported a moderate post trauma stress ($n = 95$; 71%-41.7%), likewise, their scores in GHQ-12 demonstrated a high probability of mental disorder ($n = 134$; 58.7%).

No association was recorded between occupational status, whether governmental or private, and work experience with the level of distress. Workers who were exposed to COVID-19 presented varying stages of distress from mild to severe.

Medical staff who felt were more susceptible to disease showed moderate to severe impact. However, the current variable was not detected as an imposing factor for distress ($n = 98$; 55%-44%; $P = 0.14$). Moreover, the GHQ scores displayed higher prevalence of mental health problems in these healthcare workers ($n = 172$; 98%-46.9%; $P = 0.09$)

Among the female and male staff, the scores of IESR cited inconsiderably more distress in females; however, the association ratio of gender itself was not of significant value ($P = 0.17$). Similarly, our GHQ results for females showed higher scores, indicating more prevalence of mental disorders among the female personnel ($n = 98$; 66%-43.4%).

IES-R showed that marital status had a scarce association with symptoms of PTSD ($P = 0.07$), as the married subgroup reported moderate to severe impact of COVID-19 outbreak ($n = 85$; 60%-38.2%; $P = 0.14$). In the scale of GHQ, no associations were found between mental problems and marital status ($P = 0.98$). Factors like having a history of psychiatric disease or underlying chronic diseases, such as cardiovascular illnesses, were not statistically significant in the course of post trauma distress .

In only 1.8% of healthcare workers low probability of having mental disorders was extracted from the total results of GHQ-12. The majority of participants had moderate to severe risk of mental illness (98.2% all together). Years of experience, marital status, having physical comorbidities, and employment status indicated no statistical associations.

Caregivers who cared for COVID-19 patients in hospital sections ($n = 127$) exhibited a probable to high prevalence of mental health problems, with a P value of 0.05. The high prevalence scores were about 60% (33.7% in the total population), which were accountable for presenting this variable as an influencing factor for psychiatric morbidity (Table 1).

Table 1. Demographics, GHQ-12 & IES-R, Results of Healthcare Workers

Factors	No. Proportions %		Impact of events scale IES-R			P value	General health questionnaire GHQ-12			P value
			“Low”	“moderate”	“high”		Low	Probable	high	
			No. & Proportions				No. & Proportions			
Total	222		92(41.4%)	70(31.5%)	60(27%)		4(1.8%)	82(36.3%)	140(61.9%)	
employment status=						0.32				0.55
governmental	216	94.7	86(38.7%)	6(2.7%)	59(26.5%)		4(1.8%)	76(33.6%)	134(59.2%)	
private	12	5.3	6(2.7%)	5(2.2%)	1(0.4%)		0	6(2.6%)	6(2.6%)	
Age=						0.65				0.45
<30 years	66	29.2	30(13.5%)	21(9.4%)	13(5.8%)		1(0.4%)	29(12.8%)	36(15.9%)	
30-40	78	34.5	29(13%)	21(9.4%)	26(11.7%)		1(0.4%)	26(11.5%)	49(21.6%)	
40-50	63	27.9	24(10.8%)	22(9.9%)	15(6.7%)		0	20(8.8%)	43(19%)	
>50 years	19	8.4	8(3.6%)	6(2.7%)	5(2.2%)		1(0.4%)	6(2.6%)	12(5.3%)	
Gender=						0.17				0.14
Male	78	34.2	38(17.1%)	24(10.8%)	16(7.2%)		1(0.4%)	35(15.4%)	42(18.5%)	
female	150	65.8	54(24.3%)	46(20.7%)	44(19.8%)		3(1.3%)	47(20.7%)	98(43.3%)	
Education=						0.02				0.32
undereducated	12	5.3	2(0.9%)	5(2.2%)	5(2.2%)		1(0.4%)	3(1.3%)	8(3.5%)	
Associate's degree	45	19.7	14(6.3%)	11(4.9%)	17(7.6%)		0	22(9.7%)	23(10.1%)	
Bachelor's degree	115	50.4	47(21.1%)	36(16.2%)	30(13.5%)		2(0.8%)	38(16.8%)	74(32.7%)	
Master's degree	21	9.2	7(3.1%)	7(3.1%)	6(2.7%)		1(0.4%)	7(3%)	13(5.7%)	
Doctorate & postdoctoral	35	15.4	22(9.9%)	0	2(0.9%)		0	12(5.3%)	22(9.7%)	
Years active=						0.28				0.54
2 years>	32	14	16(7.2%)	12(5.4%)	3(1.3%)		1(0.4%)	11(4.8%)	19(8.4%)	
2-5 years	43	18.9	19(8.5%)	12(5.4%)	11(4.9%)		0	20(8.8%)	23(10.1%)	
5-10 years	37	16.2	14(6.3%)	8(3.6%)	12(5.4%)		1(0.4%)	15(6.6%)	20(8.8%)	
>10 years	116	50.9	43(19.3%)	38(17.1%)	34(15.3%)		2(0.8%)	36(15.9%)	78(34.5%)	
Marital status=						0.07				0.96
single	75	32.9	34(15.3%)	23(10.3%)	17(7.6%)		1(0.4%)	28(12.3%)	45(19.9%)	
married	146	64	56(25.2%)	47(21.1%)	38(17.1%)		3(1.3%)	52(23%)	90(39.8%)	

divorced	7	3.1	2(0.9%)	0	5(2.1%)	0	2(0.8%)	5(2.2%)	
Living with/- =						0.12			0.12
family	202	88.6	76(34.2%)	64(28.8%)	56(25.2%)		4(1.7%)	68(30%)	128(56.6%)
alone	26	11.4	16(7.2%)	6(2.7%)	4(1.8%)		0	14(6.1%)	12(5.3%)
How much you consider yourself exposed to disease =						0.11			0.49
low	10	4.4	6(2.7%)	1(0.4%)	3(1.3%)		0	6(2.6%)	4(1.7%)
moderate	44	19.3	22(9.9%)	15(6.7%)	6(2.7%)		1(0.4%)	13(5.7%)	30(13.2%)
high	174	76.3	64(28.8%)	54(24.4%)	51(22.9%)		3(1.3%)	63(27.6%)	106(46.4%)
Exposed to disease=						0.14			0.09
Yes	180	78.9	78(35.1%)	55(24.7%)	43(19.3%)		2(0.8%)	70(30.7%)	107(46.9%)
No	48	21.1	14(6.3%)	15(6.7%)	17(7.6%)		2(0.8%)	12(5.2%)	33(14.4%)
Underlying disease=									
Yes	120	52.6	92(41.8%)	70(31.5%)	60(27%)		4(1.7%)	82(35.9%)	140(61.4%)
No	108	47.3	0	0	0		0	0	0
History of psychiatric illness=						0.33			0.81
Yes	11	4.8	4(1.8%)	2(0.9%)	5(2.1%)		0	3(1.3%)	7(3%)
No	217	95.2	88(39.6%)	68(30.6%)	55(24.7%)		4(1.7%)	79(34.6%)	133(58.3%)
Taking care of subjected patient=						0.31			0.05
Yes	127	55.7	48(21.6%)	44(19.8%)	29(13%)		0	50(21.9%)	77(33.7%)
No	101	44.3	44(19.8%)	26(11.7%)	31(13.9%)		4(1.7%)	32(14%)	63(27.9%)
Occupation=						0.03			0.84
Service personnel	24	10.5	10(4.5%)	7(3.1%)	7(3.1%)		1(0.4%)	8(3.5%)	15(6.5%)
Practical nurse	30	13.2	8(3.6%)	8(3.6%)	13(5.8%)		0	14(6.1%)	16(7%)
Assistant nurse	135	60.5	51(22.9%)	44(19.8%)	38(17.1%)		3(1.3%)	48(21%)	86(37.7%)
doctor	35	15.4	22(9.9%)	11(4.9%)	2(0.9%)		0	12(5.2%)	22(9.6%)
Member of faculty	1	0.4	1(0.4%)	0	0		0	0	1(0.4%)
"P values less than. 05 shows association"									

Table 2. Underlying Diseases in Hospitalized COVID-19 Patients

Underlying Disease	No.	(%)
Hypertension	13	5.7
Diabetics	7	3.1
Hyperlipidemia	17	7.5
GI diseases	21	9.2
cancer	2	0.9
Myocardial Infarction	1	0.4
Other CVD	6	2.5
Head trauma	3	1.3
Pulmonary diseases	14	6.1
Dermatologic problems	17	7.5
seizure	1	0.4
Cerebrovascular accident	0	0
Other	18	7.9

Discussion

Our results showed low rates of distress among healthcare staff. However, in Singapore the SARS phenomenon had greatly impacted healthcare workers in a way that a remarkable increase was observed in the prevalence of PTSD, two months after the outbreak (21). In contrast to our results, the conclusions of previous outbreak of MERS exerted significantly high scores in total IES-R, which suggest that HCWs are the main target for psychiatric assessments (22). Similar findings of PTSD symptoms in a multinational, multicenter study revealed low rates of prevalence of psychological impact (3.8%) (23), which is a fine opposition to the moderate to serve impact among general population in china (24). Findings in Canada one or two years after the resolution of SARS pointed out that the incident of new onset of PTSD was 2% (25).

According to our general mental health analysis, moderate to severe mental health issues were accounted. The study of burnout found a prevalence of 28% psychiatric disorders among senior oncologists and palliative care specialists in London (26). The data also resemble the observations by a British study on the staff of the emergency ward (32%) (27). A timely rapid systemic review and meta-analysis of available cross-sectional articles provide us with evidence that numerous healthcare workers suffer from considerable anxiety and depression during COVID-19. An online survey conducted eight weeks after the emergence of COVID-19 outbreak on healthcare workers showed a noticeable prevalence of assorted comorbid mental symptoms (28).

The explanation of such endured psychological problems is rationalized by the lack of protective equipment and the looming shortages of preventive controlling measurements. Healthcare workers rely on safety accouterments to protect themselves and the patients. However, these circumstances put healthcare providers,

especially frontline workers, at risk. They are obliged to work with insufficient accommodations, which would eventually build up complications in provisions of care for subjected patients (29). It is apparent that high levels of occupation support and preferable justice in care providing workplaces augment emotional status (30). The reason that why we noticed substantial probabilities of psychiatric disorders without observing concomitant increased impact of incidence particularly remains a question that can be defined by the differences between the two categories of scales. The mental disturbances of medical staff are contributed to the feelings of guilt over transmitting the virus to their family members. The other logical interpretation of mentioned results is attributed to witnessing COVID-19 mortalities (31).

Differing ranges of mass sensation of being exposed to disease had notable relationship to mental health problems as well as post trauma symptoms. We found that more exposure was associated with worse psychological well-being. It is mostly described by the fact that we had held the study in COVID-19 assigned hospitals and we were faced with tax exposure due to exceeding number of patients suspected to COVID-19 who were referred to our hospitals. Data of "zhang w et al" have also noted that being in contact with COVID-19 patients in health departments were the most dominant risk factor in psychological matters (28). It was shown that working in frontline positions appeared to be an independent risk factor for psychiatric symptoms since healthcare workers in the frontline are constantly facing critical situations and are directly engaged with COVID-19 patients (32).

Our results conform the evaluated risk perception of the staff from SARS-affected intuitions in Singapore, which was comparatively high (66%) (33). Adversely, there are data collected from SARS-related appraisals with no significant difference between mental status of frontline workers in high-risk hospital wards and others who had not been exposed to SARS. However, contrary results

were expected considering the fact that generally their affiliated healthcare workers had limited contacts with potential cases of SARS (21).

We have found that female staff were facing more inconveniences compared to males, which is concurrent with the past epidemiological studies relating to gender (24). It is predominantly due to their typical biological characteristics (34). Women in the society and their workplaces have more potential in developing impediments to deal with the psychological consequences. They need more utilization of social aids while men who are engaged in more use of humor are more capable to apply beneficial coping mechanisms (35). Other studies have confirmed the same results (36) (37).

The assistant nurses and practical nurses in our study had high distress levels among other healthcare positions. A study of 85 nurses showed their high anxiety and fear for themselves and their family affiliations (38). An evaluation carried out in Hunan province, China, during the initial stages of the COVID-19 showed that the prevalence of probable anxiety and depression in neurological nurses was higher than that in doctors (39). Nurses, in particular, have close contact with patients and have a pivotal role in controlling the infection. Healthcare workers especially nurses are encountering the dilemma of maintaining both the dedication to their duties as well as preserving their own health while working in facilities.

Education levels had major effects on exhibited distress, as having a bachelor's degree or higher academic degrees was relevant to the lower impact of disease. This is recognized as one of the predictors of post traumatic distress and anxiety because of its negative association. A study in Peru on COVID-19 indicated that healthcare workers with a lower education level were more anxious (40), which is similar to the conclusions found in evaluations of PCL-5 scores in the course of educational levels (36). There are affirmative data in the results of Wasim, T et al which stated that level of education had a strong impact on development of insomnia in healthcare workers (41) a; it could be due to their limited information about the spread of the virus in addition to the lack of knowledge of virus restraint schemes.

Various strategies can help to reduce negative moral effects of COVID-19. It is important to shield the mental health of medical caregivers so that the enhancement of health delivery would occur. Studies as ours provide assisting information in the scope of posttraumatic stress and mental health disorders of medical staff, which emphasize the improvement of screening methods for psychiatric health status of the hospital staff. Additionally, health authorities should implement essential interventions to reduce anxiety and depressive symptoms of the healthcare staff. Enhancing stress management on this targeted group should be widely considered.

Limitation

This was a cross-sectional study that was carried out in a short period of time. Despite the low rates of posttraumatic stress, we should be aware of the potential accumulation of stress over time. Our questionnaires were self-administered and thus confounded results may be slightly possible. Our recruited population was only relatively healthy staff. We did not have indicating criteria for distinguishing healthcare workers who were already affected by the virus or the ones who were previously sick and had recovered. In addition, sampling was random and diagnostic measurements were not used to identify sick volunteers. Thus, further appraisals in terms of psychological well-being of hospital staff should be done. On the other hand, we must note that our results are presumed to encompass more mental disturbances than any further studies as it was conducted in relatively the most critical time of pandemic.

Conclusion

The impact of the COVID-19 infection on healthcare workers is real. Among our population of healthcare staff, frontline nurses in particular encountered more anxiety and distress. Female workers to some degrees were more susceptible to mental problems. Also, low education level was a predictor of PTSD.

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Conflict of Interest

None.

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