



Anxiety and Stress Seem Temporary during the Pneumonia COVID-19 Pandemic: A Survey on the Mental Health Status of Healthcare Workers

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ABSTRACT

Objective: To evaluate the presence/severity of depression, anxiety, and stress among health care workers (HCWs) who work on the specially allocated COVID-19 ward (Group A) and HCWs on the other wards (Group B).

Methods: This questionnaire-based study was conducted from January 25 to February 28, 2021. The mental status was assessed using the Persian version of the 42-item Depression, Anxiety, and Stress score (DASS-42). Gathered data was analyzed using SPSS version 25. The independent T-test and Chi-square tests were used to compare quantitative and qualitative variables.

Results: Two-hundred and twenty two questionnaires were eligible for analysis. Group A consisted of 33 HCWs, and 189 (85.1%) individuals were working on the other wards. No statistically significant differences were seen regarding the Socio-demographic features except for the marital status ($p=0.005$). The depressions' mean score was comparable between group A and B ($p=0.102$). The mean scores of anxiety and stress were significantly lower in group A than group B ($p=0.006$), although the frequency of DASS-42 parameters did not differ between these two groups ($p>0.05$).

Conclusion: Contrary to our assumptions, this study showed that the DASS-42 parameters were not higher in HCWs working on the COVID-19 wards. This might be justified by developing coping mechanisms, being on the honeymoon phase of the disaster, compassion satisfaction, promising vaccine news, and working on the less impacted hospital.

Keywords: Anxiety; Stress; Pneumonia; COVID-19; Pandemic; Healthcare workers.

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Introduction

Pneumonia of unknown origin, lately named COVID-19 by the world health organization (WHO), is one of the leading causes of death worldwide and has been responsible for more than 3.5 million fatalities since its emergence in Wuhan City, China [1, 2]. Unfortunately, all jobs and workers have been hit by the pneumonia COVID-19 pandemic. In a systematic review study, Bandyopadhyay *et al.*, argued that 1413 healthcare workers (HCWs) have passed away due to COVID-19 until the 8th of May 2020 [3]. Of note, the authors had relied on the published articles and deaths reported by non-government websites/social media. Moreover, we believe that the number of deceased health care workers (HCWs) was not wholly precise at the beginning of the pandemic by considering of the diagnostic tests scarcity along with the inaccuracy of our knowledge about the diversity of clinical findings. Anyway, the number of HCWs who died of pneumonia COVID-19 continued increasing, and the WHO Pan American Regional Office in Washington, DC had declared that 2500 HCWs died of pneumonia COVID-19 only in the Americas [4]. This high morbidity and mortality have posed an unprecedented challenge to HCWs.

Previous studies showed that HCWs, especially those working in frontline and crowded hospitals were more prone to the development/worsening of mental health problems such as anxiety, stress, depression, somatization, burning mouth syndrome, and even the spectrum of suicidal behavior [5-7]. These findings were in line with the mental health status of HCWs during the severe acute respiratory syndrome (SARS) [8-10] and Ebola [11] pandemic.

Several factors have contributed to HCWs' physical and psychological exhaustion and morbidity, including remarkable numbers of HCWs' death, perceived paucity/inaccurate distribution of personal protective equipment (PPE), and isolation from family [12, 13]. These points may endanger HCWs' mental health, affect their decision-making capabilities and efficacy of health care delivery, and subsequently debilitate the health care system [14]. Therefore, each system must be aware and monitor the mental status of its HCWs.

The majority of studies have been conducted in the hospitals especially designated to treat pneumonia COVID-19 patients. However, almost all hospitals, including trauma centers, have to deal with these patients as well. We believe that monitoring the HCWs' mental health in the trauma center is crucial since they constantly face a higher workload and have more patients-to-HCW contact [15]. Moreover, we are unable to obtain a comprehensive history and perform physical examinations in terms of pneumonia COVID-19 signs and symptoms in trauma patients [16]. All these factors could affect the mental health of the HCWs. Therefore, in this

study, we aimed to investigate the mental status of the HCWs, compare those working on specially allocated pneumonia COVID-19 wards and HCWs patients' caring on other wards regarding perceived depression, anxiety, and stress.

Materials and Methods

Study Design

The recent survey has purposed to investigate the prevalence of new-onset psychological disorders following the pneumonia COVID-19 pandemic in Rajaei (Emtyaz) teaching hospital in southern Iran. This study was conducted from January 25th to February 28th, 2021. Although our center is the only referral trauma center in south of Iran, local policymakers had to assign some wards for pneumonia COVID-19 patients, considering the overcrowding in our other hospitals, which were exclusively set for pneumonia COVID-19.

We have stratified the HCWs into two groups based on the instructions of the Hospital Quality Improvement Committee: personnel working on pneumonia COVID-19 designated wards (group A) and those working on the other wards (group B). Our primary assumptions were that group A might suffer from mental health problems including depression, anxiety, and stress more frequently and severely than group B.

Necessary training to increase the personnel's and patients' awareness about the nature of the SARS_Cov_2, its transmissibility, and required Personal protective equipment (PPE) has been persistently provided since the beginning of this dreadful pandemic. Furthermore, the proper implementation of this training has been guaranteed by the scientific and nursing officials within the hospital. In particular, the purpose of the recent study was to assess whether working on pneumonia COVID-19 wards was associated with higher scores of depression, anxiety, and stress.

Participants

This cross-sectional, questionnaire-based study was conducted from the 25th of January to the 31st of February, after curbing the third wave of pneumonia COVID-19 in Iran. All HCWs employed in Rajaei Trauma Hospital were asked to participate in the survey over two weeks. The sampling method was the census. Eligible respondents were all applicant nurses, technicians, healthcare treatment assistants, and public health assistants working in our center. At first, demographic information such as age, sex, and level of education was asked. Second, they were called on to fulfill a well-designed self-reported questionnaire. All information of the participants remained confidential, and no one except the research team had access to the questionnaires. The exclusion criteria were unwillingness to participate and partially completed questionnaires.

Socio-demographic Features

Demographic data, including age, gender, the last academic degree (if any), marital status, duration of service, past medical history of known and documented mental illnesses, and whether the respondents received any psychiatric medications were gathered.

Depression, Anxiety, Stress Scale (DASS)

The forty-two-item version of the DASS self-reported questionnaire (DASS-42) was used to assess the presence/severity of new-onset depression, anxiety, and stress of the HCWs. This questionnaire was prepared in 1995 by Lavibund *et al.*, [17, 18]. The validity and reliability of the DASS questionnaire were assessed in Turkish [19], Greek [20], and other languages [21, 22]. Of note, the reliability and validity of the Persian version of this questionnaire were previously evaluated by Afzali *et al.*, [23] as well as Askari *et al.*, [24] in 2007 and 2013, respectively. Each subscale contains fourteen 4-point Likert questions, and each question has four probable answers: never (zero), little (score one), sometimes (score two), and always (score three). The severity of anxiety, depression, and stress was calculated by summing the score of all relevant questions. They were then calculated and subsequently divided into four distinct categories: mild, moderate, severe, and very severe. The cut-off values for each type are shown in Table 1. Of note, a higher score implies worse mental health conditions in the last week.

Statistical Analysis

Gleaned data were analyzed using the Statistical Package for Social Sciences software (SPSS. Inc., Chicago, Ill., USA) version 20. Mean with standard

deviation (SD) were used to describe the quantitative variables, and frequencies with percentages were calculated to explain the qualitative ones. In addition, an independent T-test and the Chi-square tests were conducted to compare quantitative and qualitative variables between the two groups.

Results

Three hundred and one forms were collected, and two hundred and twenty-two were wholly fulfilled and thus eligible for further analysis.

The socio-demographic features of all respondents are shown in Table 2. The mean \pm SD age of the respondents was 31.37 ± 5.96 , ranging between 21-52 years old. The majority of participants were women (74.8%), married (52.7%), caring of non-COVID-19 patients (group B, 85.1%), and had academic degrees (88.7%). Of note, only five respondents (2.3%) had declared to have documented psychiatric problems, and none of them were working on specially allocated pneumonia COVID-19 wards. Comparing our two groups showed no significant differences in socio-demographic characteristics except for marital status; the frequency of married respondents was significantly higher in group B than in group A ($\chi^2(1)=7.802$; $p=0.005$).

Contrary to the previous studies and our assumptions, the mean \pm SD scores of anxiety and stress were significantly lower in HCWs caring of pneumonia COVID-19 patients (7.51 ± 8.44 , 12.09 ± 10.38) than those in group B (12.57 ± 9.78 , 17.31 ± 9.79) who were working on the other, non-COVID-19 wards (Both $p=0.006$) as shown in Table 3. Although it was not statistically significant, the mean score of depression was comparable in group A to group B ($p=0.102$).

Table 1. Patterns of distribution of DASS parameters between two study groups.

DASS-42 variables; n (%)	Group A ^a (n=33)	Group B ^b (n=189)	p value ^d
Depression			0.354
Normal (0-9)	21 (63.6%)	83 (43.9%)	
Mild (10-13)	2 (6.1%)	17 (9.0%)	
Moderate (14-20)	4 (12.1%)	34 (18.0%)	
Severe (21-27)	4 (12.1%)	36 (19.0%)	
Extremely Severe (+28)	2 (6.1%)	19 (10.1%)	
Anxiety			0.061
Normal (0-7)	21 (63.6%)	75 (39.7%)	
Mild (8-9)	2 (6.1%)	11 (5.8%)	
Moderate (10-14)	5 (15.2%)	28 (14.8%)	
Severe (15-19)	1 (3.0%)	28 (14.8%)	
Extremely Severe (+20)	4 (12.1%)	47 (24.9%)	
Stress			0.093
Normal (0-14)	20 (60.6%)	70 (37.0%)	
Mild (15-18)	5 (15.2%)	27 (14.3%)	
Moderate (19-25)	4 (12.1%)	58 (30.7%)	
Severe (26-33)	3 (9.1%)	24 (12.7%)	
Extremely Severe (+34)	1 (3.0%)	10 (5.3%)	

^aGroup A: Respondents working on COVID-19 designated wards; ^bGroup B: Participants working on the other wards; ^cDASS: Depression-Anxiety-Stress Score; ^dChi-square test.

Table 2. Socio-demographic characteristics of the respondents by the working wards (n=222).

Variable	Overall (n=222)	Group A ^a (n=33)	Group B ^b (n=189)	p value
Age ⁺	31.37±5.96	29.75±5.57	31.72±6.35	0.102 ^d
Sex				0.667 ^c
Male	56 (25.2%)	7 (21.2%)	49 (25.9%)	
Female	166 (74.8%)	26 (78.8%)	140 (74.1%)	
Last academic degree				0.387 ^c
Academic	197 (88.7%)	31 (93.9%)	166 (87.8%)	
Non-academic	25 (11.3%)	2 (6.1%)	23 (12.1)	
Marital Status				0.005 ^c
Single	105 (47.3%)	23 (69.7%)	82 (43.4%)	
married	117 (52.7%)	10 (30.3%)	107 (56.6%)	
Service duration ^e	8.78± 4.23	9.31±6.63	8.57±5.04	0.565 ^d
Psychiatric problem				1.000 ^c
Yes	5 (2.3%)	0 (0.0%)	5 (2.6%)	
No	217 (97.7%)	33 (100.0%)	184 (97.4%)	
Psychiatric drug				1.000 ^c
Yes	25 (11.3%)	3 (9.1%)	22 (11.6%)	
No	197 (88.7%)	30 (90.9%)	167 (88.4%)	

^aGroup A: Respondents working on COVID-19 designated wards; ^bGroup B: Participants working on the other wards; ^cChi-square test; ^dIndependent t-test; ^eMean±Standard deviation.

Table 3. Comparison of different DASS parameters between two study groups.

DASS ^e parameters; Mean ±SD ^d	Group A ^a (n=33)	Group B ^b (n=189)	p value ^e
Depression	8.27 ± 10.60	13.60 ± 10.95	0.102
Anxiety	7.51± 8.44	12.57 ± 9.78	0.006
Stress	12.09 ±10.38	17.31±9.79	0.006

^aGroup A: Respondents working on COVID-19 designated wards; ^bGroup B: participants working on the other wards; ^cDASS: Depression-Anxiety-Stress Score; ^dSD: Standard Deviation; ^eIndependent t-test.

When we classified the severity of depression, anxiety, and stress scores according to the cut-offs provided within the questionnaire (Table 1), the DASS questionnaire failed to show significant differences between the presence/severity of depression ($p=0.354$), anxiety ($p=0.61$), and stress ($p=0.093$) between HCWs working on specially allocated-COVID-19 wards and those who were working on the other, non-COVID-19 wards.

Discussion

Contrary to our assumptions and previously conducted studies [25-29], the recent survey has shown no significant differences in the frequency and severity of the new-onset mental problems among HCWs caring for pneumonia COVID-19 patients compared to those who were working on the other wards. However, there were no statistically significant differences regarding the socio-demographic parameters. Moreover, the mean score of anxiety and stress was noticeably lower in group A than in group B. Although these findings were unforeseen, our literature search provided some explanations.

First, it should be mentioned that the majority of the studies were conducted at the beginning of the pneumonia COVID-19 pandemic when the knowledge about different aspects of the disease's pathophysiology and the PPE were inadequate, and

these inadequacies had posed major concerns among HCWs [30-32]. However, our survey was conducted late in the pneumonia COVID-19 pandemic, and our HCWs have been well-educated regarding the prevention precautions since the begging of this frightening pandemic. Furthermore, Ranieri *et al.*, [33] and Trumello *et al.*, [34] believed that short-term expositions to stressors might result in higher stress and anxiety. In fact, these morbidities appear rapidly early on every pandemic and are tackled by personal traits, psychological adaptations/resilience [35, 36], and coping mechanisms [2, 37].

According to the phases model of disaster drawn by Zunin and Myers, each disaster has composed of six distinct phases. A substantial shift in emotion specifies the 4th phase (honeymoon phase). Several factors are attributed to making this phase. More social/peer support, which leads to stronger community binding, and more available disaster assistances are two major factors. Moreover, society, including HCWs is optimistic that everything will return to normal quickly. Unfortunately, the honeymoon phase will last for no more than a few weeks [38]. We hypothesized that our study was conducted in this time interval since the fourth wave of pneumonia COVID-19 struck our country. It has been proven that social/peer support significantly alleviates stress or anxiety among HCWs [39, 40]. Yang *et al.*, showed social support is inversely

correlated to the anxiety measured by DASS-21 [12].

The third explanation could be compassion satisfaction which implies the sense of pleasure and satisfaction following helping others. Our HCWs were dealing with many patients during the pandemic, treating them and making empathy with these sick people. It has been documented that compassion satisfaction alleviates stress, anxiety, and burnout among healthcare workers [41, 42].

Other possible explanations are recognizing self-worth, a sense of purpose [43, 44], promising vaccine news and working on the less impacted hospitals [45].

Our study has shown that HCWs working on specially allocated pneumonia COVID-19 wards had a comparable level of depression compared to other HCWs by using the DASS-42 questionnaire, and the level of anxiety and stress were significantly lower. The possible responses were developing coping mechanisms, psychological adaptation, being on the honeymoon phase of the disaster, compassion satisfaction, recognizing self-worth, a sense of purpose, promising vaccine news, and working in the less impacted hospital. However, these factors were not directly addressed in our study. Therefore, a more comprehensive analysis is needed to measure these parameters.

Limitations

Several limitations should be acknowledged in the current study. First, this survey was conducted in only one hospital; therefore, it might not represent all Iranian HCWs. Second, the self-reporting nature of questionnaires may invoke under- or over-report of mental health symptoms. Third, we used only one

questionnaire, and it should be noted that different questionnaires may provide mixed results. Forth, this study was continued for only two weeks, and no data were available in our province to compare the mental health status of HCWs at the beginning of and late on the pandemic.

Declarations

Ethics approval and consent to participate:

Ethical approval was obtained from the institutional review board (IRB) and research ethics committee of Shiraz University of Medical Sciences (SUMS), ethic number: IR.SUMS.REC.1400.210

Conflict of interests: The authors declare that there are no conflicts of interests.

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Authors' contributions:

Conceptualization: Hossein Abdolrahimzadeh Fard, Hamid Reza Abbasi, and Amir Hossein Shams; Methodology: Roham Borazjani, Shiva Aminnia, Vala Rezaee; Formal analysis and investigation: Maryam Salimi, Mahsa Ahadi, Nikita Rabiei, Sanaz Zare, Mina Sadeghi, Leila Shayan; Writing - original draft preparation: Roham Borazjani, Leila Shayan, Shahram Paydar; Writing - review and editing: Hossein Abdolrahimzadeh Fard, Roham Borazjani, Shahram Bolandparvaz; Supervision: Hossein Abdolrahimzadeh Fard, Vala Rezaee

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