

Research Paper

Assessing Job Burnout Status in Front-line Healthcare Providers at Mazandaran University of Medical Sciences During the COVID-19 Epidemic in 2022



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ABSTRACT

Background: The COVID-19 epidemic was a biological disaster that may cause or exacerbate burnout in healthcare professionals (HCPs). Our goal was to determine the impact of the long-term COVID-19 epidemic on burnout in front-line healthcare workers and the factors affecting it.

Materials and Methods: This cross-sectional survey on front-line HCPs' job burnout based on an online platform was conducted at Mazandaran University of Medical Sciences. The demographic characteristics, medical-work-related factors, and COVID-19 exposure were collected by the self-reported Farsi version of the Maslach burnout inventory questionnaire.

Results: Out of 2100 sent questionnaires, 924 participants completed them (44% response rate) of which 280 were male (30.3%). Overall, 850(92%) respondents had a high level of emotional exhaustion, 872(94.4%) had a high level of depersonalization, and 112(12.1%) had a high reduced personal accomplishment. There was a significant relation between higher burnout levels with higher education levels, working in hospitals as clinical staff, and pre-hospital operational personnel as well as having direct contact with a significant number of COVID-19 Patients. A significant number of participants (94.2%) were in severe and moderate burnout levels.

Conclusion: There was a significant increase in job burnout among front-line HCPs during the COVID-19 epidemic compared to former similar studies at the beginning of the epidemic and non-epidemic periods. It is recommended that in disaster management planning, especially in long-standing ones like COVID-19, the proper programs should be considered for increasing the resilience of HCPs.

Keywords:

Health personnel, SARS-CoV-2, COVID-19, Burnout, Iran

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1. Introduction

Job burnout is a major concern among physicians, nurses, and other health care providers [1]. Health care providers (HCPs) is experiencing high workload, strict organizational regulations, and insufficient time to deal with job challenges, rapidly evolving domains, and poor interpersonal support in daily life [2]. These challenges lead to “Emotional Fatigue”, where the person feels overwhelmed and lacks the energy to do something. “Depersonalization” may follow emotional burnout, where one person may treat others as a pessimistic object. Decreased feelings of self-efficacy and competence also affect a person's emotional health. Thus, emotional issues, depersonalization, and diminished sense of personal accomplishment characterize burnout, which is a growing concern for the global health care community [3].

Since December 2019, COVID-19 has spread rapidly around the world, affecting people in 210 countries and regions, with more than 251 million deaths and more than 5 million deaths have lost [4]. The epidemic has led to high levels of panic and anxiety around the world, in addition to taking a toll on the world. Healthcare providers (HCPs) are key players in the management of COVID-19 epidemic and are inevitably at the forefront of exposure to the virus; therefore, they constitute a significant proportion of people with the disease [5].

The COVID-19 global pandemic has drastically changed how we live and work. [The World Health Organization \(WHO\)](#) reported more than 88 million cases and 1.9 million deaths worldwide up to 12 January 2021. Amid the prolonged struggles against COVID-19, burnout, a chronic psychological condition with a loss of enthusiasm and personal accomplishment, feelings of physical and mental exhaustion, and depersonalization, of the frontline healthcare professionals has become a significant concern [6].

Healthcare workers (HCWs) exhibit higher rates of anxiety, depression and suicidal ideation when compared to the general population. Burnout, a syndrome of exhaustion, detachment and reduced fulfilment, develops in 20%–80% of HCWs. During emergencies such as pandemics, increased posttraumatic stress disorder (PTSD), anxiety and depression in HCWs may relate to both individual and system factors [7].

Previous systematic reviews have shown that burnout scores for emotional fatigue range from 31% to 54.3%, depersonalization 17.4% to 44.5%, and low personal success rates of 6% to 39.6% among physicians in the

UK [8]. Such a high burden of burnout is likely to increase during the Corona virus (COVID-19) epidemic, where health care providers face high workloads in most health systems. Recent media reports also highlight this vital challenge, which may affect the values of health care during the epidemic and necessitate an ethical discourse on burnout [9].

Numerous studies in Mazandaran province on burnout of nurses in different wards of hospitals and pre-hospitals were conducted before the coronary epidemic. Based on the results of those studies, all nurses and staff in various departments, including oncology and emergency, had some degree of burnout [10, 11]. In the Corona epidemic, various studies were conducted in the country on the effect of prolonged corona epidemic on burnout status of medical staff in other universities, all of which showed significant degrees of burnout of medical staff and its effect on job satisfaction [12, 13]. Due to the importance of this issue at the front line health care personnel in confront to Corona virus, there was have not been a study yet in the affiliated units of [Mazandaran University of Medical Sciences](#). Therefore this study aimed to explore the current conditions of job burnout in front-line health care personnel in [Mazandaran University of Medical Sciences](#) in order to be aware of the severity and extent of the problem and the necessary interventions to be properly planned. In addition we want to investigate the relationship between demographic and workspace.

2. Materials and Methods

The present cross-sectional study was performed by the participation of front-line healthcare personnel (pre-hospital, hospital, and health networks) from February 10 to April 11, 2020.

Data collection tools used in this study include a self-fulfillment questionnaire including demographic information (age, gender, marital status, number of children, last degree, place of work, work experience, type of employment, number of work shifts or extra shifts per month, working days in direct contact with patients with suspected or confirmed COVID-19 cases, as well as the Farsi version of Maslach burnout inventory [14].

This questionnaire is the most common tool for measuring job burnout and consists of 22 separate sections and covers all three aspects of burnout including emotional exhaustion, depersonalization, and feelings of reduced personal accomplishment. This questionnaire consists of 9 items related to emotional exhaustion that allows respondents to express feelings of extreme weakness and emotional exhaustion towards patients and the work-

place, 5 items related to depersonalization, and 8 items related to reduced personal accomplishment. Maslach and Jackson rated the internal reliability of the questionnaire as 0.71 to 0.9 [15]. The standard Persian version of the questionnaire had a validity of more than 0.9 [16].

In the questionnaire, the frequency scored from 0 to 6 (never, several times a year, once a month, several times a month, once a week, and every day) and the intensity scored from 0 to 7 (nothing, very much low, low, less than average, average, more than average, high, and very high). The classification and cut-off points for the subscales are divided into three groups based on frequency and severity including low, medium, and high.

For emotional exhaustion in the intensity subgroup, scores of 17 and less were classified as low, 18 to 29 as moderate, and 30 and above as high, and for the frequency subgroup, scores of 25 and less were classified as low, 26 to 39 as medium, and scores of 40 and above were considered as high. In general scores of 16 and less were classified as low, 17 to 26 were classified as moderate, and 27 and above were classified as high.

For depersonalization in the intensity subgroup, a score of 5 or less was considered low, a score of 6 to 11 was considered moderate, and a score of 12 and above was considered high, and in the frequency subgroup a score of 6 and less was considered low, a score of 7 to 14 was considered medium, and a score of 15 and above was considered high. In total, scores of 6 and less are classified as low, 7 to 12 as moderate, and 13 and above as high.

For reduced personal accomplishment in the severity subgroup, a score of 40 and above was classified as low, 34 to 39 as medium, and 33 and less as high. For the subgroup frequency, a score of 44 and more was classified as low, 37 to 43 as medium, and 36 or less was considered high. In general scores of 39 and more were classified as low, 32 to 38 as moderate, and 31 and less as high.

In question 23, participants were asked about their overall self-assessment of job burnout in two subgroups of intensity and frequency.

The e-questionnaire was distributed on the online platform, and the introduction page of the questionnaire, the respondents could see the researcher's self-introduction, research purpose, the introduction of the questionnaire content, and the informed consent form.

Data from individuals who voluntarily completed the questionnaire were collected and analyzed. The exclusion criteria

were non-response to all questions of the questionnaire. The data were analyzed in the form of descriptive statistics as Mean±SD for quantitative and frequency variables and percentages for qualitative variables, as well as statistical tests to examine the significant relationship between the variables. According to the positive (higher than the cut-off score of the dimension) number of respondents in three dimensions, we divided job burnout into four levels: no burnout (all the three dimensions are negative); mild burnout (only one of the three dimensions is positive); moderate burnout (arbitrary two of the three dimensions are positive); and severe burnout (all the three dimensions are positive) [17, 18].

3. Results

Out of 2100 questionnaires observed, 924 participants completed them (44% response rate), of which 280 were male (30.3%) with Mean±SD 37.39±9.1 of age (Min-Max 21-61) and 644(69.7%) were female with Mean±SD 36.58±8.3 (Min-Max 8.3, 21-58). The complete demographic information is shown in Table 1. The Mean±SD years of experience was 11.76±7.7 (Min-Max 1-31) and the Mean±SD of additional working hours was 48.61±33.9 (Min-Max 0-100).

Overall, 850(92%) respondents had a high level of emotional exhaustion (EE), 872(94.4%) had a high level of depersonalization (DP), and 112(12.1%) had high reduced personal accomplishment (RPA) (Table 2).

Factors affecting the three dimensions of burnout

Demographic characteristics, work conditions, COVID-19 exposure potential risk, and distributions of each dimension of job burnout are shown in Table 3.

As shown in Table 3, there is a significant relationship between higher burnout levels with higher education levels, working in hospitals as clinical staff and prehospital operational personnel as well as having direct contact with a significant number of COVID-19 patients.

Based on burnout levels, a significant number of participants (94.2%) were in severe and moderate levels, while most of them were in the moderate group (Table 4).

There was no relationship between additional working hours and all three dimensions of job burnout (EE (R: 0.11), RPA (R: 0.07), and DP (R: 0.12)). In the test for the relationship between years of experience and three dimensions of job burnout, there was a moderate weak relationship to RPA (R: 0.38) and there was no meaningful relationship to EE (R: 0.04) and DP (R: 0.03).

Table 1. Demographic information of participants

Variables	Group	No. (%)
Sex	Male	280(30.3)
	Female	644(69.7)
Age groups (y)	20-29	224(24.2)
	30-39	335(36.3)
	40-49	280(30.3)
	50-59	84(9.1)
	60≤	1(0.1)
Marital status	Single	183(19.8)
	Married	729(78.9)
	Other	12(1.3)
Education level	Diploma	104(11.3)
	Associate degree	34(3.7)
	Bachelor’s degree	636(68.8)
	Master’s degree	81(8.8)
	Doctorate≤	69(7.5)
Workplace	Health centers-headquarters	96(10.4)
	Hospital-non-clinical staff	62(6.7)
	Pre-hospital emergency centers-headquarter staff	28(3.0)
	Health centers, non-headquarter staff	119(12.9)
	Hospital-clinical staff	558(60.4)
	Pre-hospital emergency centers, non-headquarter (operational) staff	61(6.6)
Type of employment	Temporary	120(13.0)
	Corporative employment	66(7.1)
	Contractual employment	90(9.7)
	Permanent employment	491(53.1)
	Other	157(17.0)
COVID-19 exposure at the workplace	I did not have direct contact with COVID-19 patients.	38(4.1)
	I rarely have had direct contact with COVID-19 patients.	98(10.6)
	I sometimes have had direct contact with COVID-19 patients.	208(22.5)
	I always have had direct contact with COVID-19 patients.	580(62.8)

Table 2. Level of job burnout three dimensions by sex

Job Burnout Dimension	Level	Sex	No. (%)	
Emotional exhaustion	Low	Male	13(1.4)	
		Female	9(1.0)	
		Total	22(2.4)	
	Medium	Male	27(2.9)	
		Female	25(2.7)	
		Total	52(5.6)	
	High	Male	240(26.0)	
		Female	610(66.0)	
		Total	850(92.0)	
	Depersonalization	Low	Male	5(0.5)
			Female	6(0.6)
			Total	11(1.2)
Medium		Male	15(1.6)	
		Female	26(2.8)	
		Total	41(4.4)	
High		Male	260(28.1)	
		Female	612(66.2)	
		Total	872(94.4)	
Reduced personal accomplishment		Low	Male	175(18.9)
			Female	470(50.9)
			Total	645(69.8)
	Medium	Male	58(6.3)	
		Female	109(11.8)	
		Total	167(18.1)	
	High	Male	47(5.1)	
		Female	65(7.0)	
		Total	112(12.1)	

Table 3. The effect of factors on three dimensions of burnout

Factor	Item	N	EE	DP	RPA	Burnout Level
Sex	Male	280	0.00	0.21	0.02	0.48
	Female	644				
Age group (y)	20-29	224	0.17	0.66	0.62	0.37
	30-39	335				
	40-49	280				
	50-59	84				
Marital status	60≤	1	0.8	0.25	0.71	0.63
	Married	729				
	Single	183				
Education level	Other	12	0.00	0.02	0.16	0.03
	Education level	104				
	Diploma	34				
	Associate degree	636				
Working place	Bachelor's degree	81	0.00	0.03	0.00	0.02
	Master's degree, doctorate or above	69				
	Pre-hospital emergency centers, non-headquarter (operational) staff	61				
	Pre-hospital emergency centers-headquarter staff	28				
	Health centers-headquarters	96				
	Hospital-non-clinical staff	62				
	Health centers, non-headquarter staff	119				
	Hospital-clinical staff	558				
	Corporative employment	66				
	Temporary	120				
Type of employment	Other	157	0.03	0.78	0.82	0.47
	Permanent employment	491				
	Contractual employment	90				
	I did not have direct contact.	38				
COVID-19 Exposure	I have had direct contact with a small number of patients.	98	0.00	0.00	0.00	0.00
	I have had direct contact with a significant average number of patients.	208				
	I have had direct contact with a large number of patients.	580				

Abbreviations: EE: Emotional exhaustion; DP: Depersonalization; RPA: Reduced personal accomplishment.

Table 4. Job burnout level in participants

Burnout Level	No. (%)	Cumulative Percent
Severe burnout	69(7.5)	7.5
Moderate burnout	801(86.7)	94.2
Mild burnout	52(5.6)	99.8
No burnout	2(0.2)	100.0

4. Discussion

We report the first study, to our knowledge, of job burnout amongst Mazandarn Universitie’s HCWs during the COVID-19 pandemic. This study performed to explore job burnout and the relationship between possible influencing factors and the three dimensions of burnout in front-line HCPs across [Mazandaran University of Medical Sciences](#) in the time of COVID-19 epidemic. This was comparable to published rates reported by countries severely affected by the COVID-19 pandemic [7].

Front-line HCPs experienced burnout symptoms in different dimensions. Higher work hours and intensity due to the epidemic of COVID-19, place of duty, and direct contact with COVID-19 patients could increase the risk of job burnout [19].

In this study, all levels of job burnout rate in front-line HCPs was a very significant percentage of 99.8%; among them, the sum of moderate and severe job burnout was 94.2%. We compare our findings with other studies in the COVID-19 epidemic period and non-epidemic periods in Iran and other countries.

In a study conducted by Jalili et al. in 2016 in six hospitals of the [Tehran University of Medical Sciences](#), 326 people (53.0%) experienced high levels of burnout. The mean scores on emotional fatigue, depersonalization, and personal failure were 26.6, 10.2, and 27.3, respectively. The rate of burnout in the three subscales varied based on personal and occupational factors, and gender was the only variable associated with high levels in all three dimensions [5].

In another study conducted by Babamiri et al. in Hamadan, the results showed 29.33% of participants were high in emotional exhaustion (EE), 10.93% were high in depersonalization (DP), and 34.31% were low in personal accomplishment (PA) [20]. In a study in Shahid Beheshti Hospital of Kashan in 2020 by Dadkhah-Tehrani et al.,

nurses suffered from moderated burnout. Of 372 nurses who participated in the study, the mean overall occupational burnout was 45.16 ± 22.84 which showed job burnout at a moderate level. The mean burnout was significantly higher in nurses over the age of 30 ($P < 0.01$), in males ($P = 0.05$), and in nurses working in operating rooms ($P < 0.001$) [21].

In the study in China at the beginning months of the COVID-19 epidemic in 2019, intensive care unit physicians and nurses (56.03%) reported varying degrees of burnout [22]. In another study in Romania in 2020 a significant number of front-line HCPs (76%) reported burnout [23]. In a cross-sectional study performed by Giusti et al. in Northern Italy in 2020, 76% of HCPs in an institution had job burned out [24]. Another large sample survey in the USA that was conducted in 2020 revealed HCPs who confronted COVID-19 experienced more degree of job burnout [25]. All of these studies used the Maslach burnout inventory. Therefore, the situation of burnout among healthcare workers around the world is serious and is of concern.

In the most recent studies, job burnout scores increased through the years of the COVID-19 epidemic in comparison to the former studies. In a study by Karagöl et al., four hundred and fifty-one healthcare workers (HCWs) all across Turkey showed significant levels of emotional exhaustion, depersonalization, and hopelessness [26]. In another study by Aljabri et al., a prevalent level of burnout was found among front-line HCWs during the COVID-19 pandemic [27].

Looking at previous studies, lower levels of burnout can be found. A study in 2015 on Chinese doctors revealed 27.2% moderate, and 7.4% severe burnout among 2,617 participants [28]. In a study conducted by Moradi et al. in Isfahan, moderate to low levels of job burnout were found in the pre-hospital emergency staff [16]. In another study performed by Bozorgi et al., moderate to low levels of job burnout were found in the pre-hospital

emergency medical staff at [Mazandaran University of Medical Sciences](#) in 2014 [11].

In our study as the most recent study in the front-line HCPs, we encounter a more severe degree and level of job burnout. These findings may be due to the time of the study performed, 3 years passed since the COVID-19 epidemic.

In the present study, as the most recent study of burnout in Iranian health personnel, we see higher scores and levels of burnout than in previous studies, both studies before the occurrence of the COVID-19 epidemic and studies conducted in the early stages of the epidemic. The following interpretations can be deduced from these results:

1. COVID-19 epidemic, due to its special conditions, including its unknown nature at the beginning, its scary nature, and the imposition of excess workload on HCPs has intensified the burnout of health personnel.

2. Due to the continuation of the epidemic trend that has been going on for more than 3 years, the burnout process has intensified and has caused us to face higher scores and levels of burnout in the current study.

Factors affecting burnout and its dimensions

It is emphasized in different studies that the level of job burnout depends on many components and varies from different jobs, workspaces, and different countries [29].

In our study we didn't find relationship between age and burnout. This can be attributed to the prolonged nature of the COVID-19 epidemic as longstanding disease. Our finding is similar to Aljabri et al. study that age was not a significant factor of burnout [27]. However, other studies have had different results. The study of Tsai et al. showed that age had an impact on the level of job burnout whereas the younger HCPs had higher Odds ratio (OR) [30]. In another study by Hybles et al. in 2022, older participants had lower scores of EE, and DP and higher levels of PA over time compared to younger adults. Levels of EE decreased for older adults and DP symptoms decreased over time among those 55 years or older [30]. These results may indicate the fact that working adults had higher levels of resilience and be able to balance personal life with their job.

Participants with higher education levels as another demographic characteristic had higher burnout scales in our study. In the study of Tsai et al., It was shown that

having a female gender and being younger, in addition to having higher levels of education, is associated with higher levels of burnout [30].

According to the high infectivity of COVID-19, HCPs who were directly in contact with patients had a higher level of burnout. In addition, staff who worked in hospitals as clinical staff or prehospital operational personnel had higher levels of burnout in all three dimensions. In contrast, Liu et al. [19] found that potential higher exposure to COVID-19 is accompanied by a higher level of EE but a lower level of DP and RPA than those working in the lower risk of exposure.

These different results may have resulted from different times and periods of study, wherein short-term exposure to this epidemic may inspire the dedication of medical individuals and compassion for patients, as well as a sense of heroism, leading to the decline of DP and RPA levels [19]. Besides, due to the limitations of the cross-sectional study, the long-term effects of COVID-19 exposure on job burnout cannot be achievable.

As mentioned in [Table 2](#), the high rates of the three dimensions of burnout including EE, DP, and RPA were 92, 94.4, and 12.1%, respectively. It is difficult to explain the large difference in the positive rate between the three dimensions. These interesting but different results were reported in Liu et al. study whereas the positive rates of the three dimensions of burnout including EE, DP, and RPA were 9.09, 50.57, and 56.59%, respectively [19].

Maslach et al. had a hypothesis for these three dimensions: "it is a different sequential progression over time; the occurrence of one dimension precipitates the development of another. According to this model, emotional exhaustion occurs first, leading to the development of depersonalization, which leads subsequently to reduced personal accomplishment" [31].

5. Conclusion

There was a significant increase of job burnout among front-line HCPs during the COVID-19 epidemic. The rate of moderate and severe burnout had increased dramatically compared to former similar studies at the beginning of epidemic and non-epidemic periods. Many factors such as higher education level, working in hospitals as clinical staff and prehospital operational personnel as well as having direct contact with a significant number of COVID-19 Patients had been shown to be closely related to higher burnout levels.

According to the findings of the present study, it is recommended that in disaster management planning, especially in controlling the epidemic of infectious diseases with a long standing trend, the proper programs should be considered for increasing the resilience of health system personnel as its main pillar. In this regard, psychological supports should also be taken to help front-line HCPs to reduce their job burnout and increase their resilience.

Psychological resilience mediates the stress response to trauma. High levels of psychological resilience are protective against the development of job burnout mental illness. Recent research has considered introducing resilience training as a preventative treatment for reducing job burnout and mental health outcomes amongst first line HCPs. Similar strategies could be developed for HCPs in anticipation of future public health emergencies.

Limitations

This study was cross-sectional in design. Selection bias cannot be avoided because of the low response rate (44%). More factors and their mechanisms should be considered in further studies.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, and further inquiries can be directed to the corresponding author.

Ethical Considerations

Compliance with ethical guidelines

The studies involving human participants were reviewed and approved by the Ethics Committee of [Mazandaran University of Medical Sciences](#), Sari, Iran (No.: IR.MAZUMS.REC.1400.11818).

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Authors' contributions

Conceptualization and supervision: Reza Habibisaravi; Methodology: Touraj Assadi; Investigation, writing –

original draft, review & editing: All authors; Data collection: Fariba Ghasemihamedani, Ghasem Oveis, and Sadi Azizi; Data analysis: Reza Habibisaravi and Touraj Assadi; Funding acquisition and resources: All authors.

Conflict of interest

The authors declared no conflict of interest.

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