

Burnout Among Health Care Providers During COVID-19 Outbreak

Benyamin Mousavi-Asl¹, Mohammadreza Firouzifar¹, Leyla Noury¹, Parnian Khamushian², Dina Mousavi-Asl³, Farrokh Heidari¹

¹ Otorhinolaryngology Research Center, Amir A'lam Hospital, Tehran University of Medical Sciences, Tehran, Iran

² Internal Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran

³ School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

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Abstract- COVID-19, which quickly became a global problem, in addition to its effects on public health, is very important in terms of the effect on mental health and anxiety in health care providers. Job burnout should be considered during such health crises. The study design is a cross-sectional study. A total of 87 health care providers (nurses and physicians) were included in the study. Their general information such as age, gender, years of experience, and hours working in COVID-19 was asked. They all filled Maslach burnout inventory, a questionnaire measuring job burnout with three dimensions: Emotional exhaustion (EE), Depersonalization (DP), and personal accomplishment (PA). We found that in physicians, EE ($r:0.54$, $P<0.001$) and DP were correlated with hours working in the COVID-19 ward, but no such correlation was found in nurses. Physicians had a higher DP score (mean 12.66 vs. 8.28, $P<0.001$) and lower PA score (mean 22.71 vs. 25.62, $P:0.004$) both of them represent higher burnout levels in physicians. Comparing our results with previous studies show that during the COVID-19 breakout higher level of job burnout could be found in health care workers, especially in physicians. Hours working in COVID-19 special wards can increase the level of burnout.

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Introduction

The new coronavirus disease began in Wuhan, China, in December 2019 and spread rapidly around the world, with the World Health Organization announcing the pandemic on April 11 with a total number of confirmed cases over 465,915 and deaths over 21,031. As of April 27, 213 countries were affected, with 2,858,635 confirmed cases and 196,295 deaths from COVID-19. This pandemic, which is a global problem, has challenged the health care system in various countries. The difference between the current COVID-19 and previous coronavirus outbreaks is the high rate of transmission in the population, even from healthy carriers, as well as its high mortality in the population with underlying preexisting chronic diseases such as diabetes, heart, and lung disease (1). The pressure on the health system and the health system staff is twofold. First is the overload on

the health care system capacity to deal with and respond to this epidemic and control it. The second is that health workers on the front lines and their family members are most exposed to the possibility of infection, which in turn leads to mental fatigue and the risk of infection (2). Because of increasing patient volumes, medical professionals who are not specialized in infectious disease are asked to be recruited in fields facing COVID-19 patients (3). We can find high anxiety and stress among health providers facing this sudden traumatic situation that causes physical and mental trauma (4).

HJ Freudenberg was a pioneer in the study of job burnout, described it as disability and fatigue due to working more than one's capacity and consists of fatigue, forgetting personal needs, commitment to an exterior factor, working hard for a long time, personal pressures, the brute pressure in the team, and paying too much attention to the needs of the client (5,6). He just

Corresponding Author: F. Heidari

Otorhinolaryngology Research Center, Amir A'lam Hospital, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 2166760269, Fax: +98 2142910703, E-mail address: farrokh.heidari@yahoo.com

considered emotional aspects of burnout. In the following years, efforts were made to consider other aspects of burnout. In 1986 Maslach *et al.*, developed a multi-dimensional instrument. Maslach Burnout Inventory considered depersonalization, reduced personal accomplishment and emotional exhaustion as aspects of burnout. Since then, this questionnaire has been widely used to measure burnout (6,7)

According to previous studies during past outbreaks physicians and other the healthcare workers experience a varying degree of burnout. Positive correlation has been found between anxiety and stress developed in the physicians during the outbreaks with Maslach burnout inventory scores (8,9). Physicians burnout have been estimated to result in significant financial burden to health care organizations (10).

We conducted a study to assess and compare the burnout frequency of physicians and nurses who are recruited in COVID-19 emergency wards or inpatient COVID19 special wards in Amir-alam hospital, a referral center during coronavirus outbreak in Tehran, Iran and shariatic hospital a general hospital with emergency and inpatient wards assigned to COVID19 patients.

Materials and Methods

Medical staffs including nurses and physicians (including residents and fellows) in amiralam and shariati hospital were included in the study. 87 healthcare staff, 54 of shariatic hospital and 33 of amiralam hospital filled the Maslach burnout inventory questionnaire. The age range of the participants varied from 24 to 54-year-old. All of the participants spent part of their working time in the wards in direct contact with COVID-19 patients. All of them gave their informed consent to participate in the study. They were asked of their age, gender, job (whether nurse or physician), marriage status and using antidepressant drugs during the outbreak.

Questionnaire

Maslach Burnout Inventory-Human Services Survey (MBI-HSS) is a 22 items questionnaire in three category: 1- Emotional exhaustion (EE=9 items) 2- Depersonalization (DP=5 items) 3-Reduced personal accomplishment (PA=8 items). Emotional exhaustion is the main manifestation of stress and indicates the emptiness of emotion due to overwork. Depersonalization is the interpersonal context dimension of burnout and means detached and negative response to various aspects of the job. The last dimension of this instrument is self-evaluation of burnout and refers to feelings of

incompetence and lack of successful achievement at work (11-13). Each item was rated on a 6-point scale from 0 to 6 (never=0, several times=1, once a month=2, several times a month=3, once a week or less=4, several times a week=5, and everyday=6). All the participants were asked to fill the questionnaire. The result of the questionnaire includes three scores in three dimensions: EE (items 1, 2, 3, 6, 8, 13, 14, 16, and 20), DP (items 5, 10, 11, 15, 22) and PA (items 4, 7, 9, 12, 17, 18, 19, 21). A high score in EE and DP or a low score in PA shows a high level of occupational burnout. Scores ≥ 37 for Emotional Exhaustion, ≥ 13 for Depersonalization, and ≥ 39 for Personal Accomplishment are assumed high (7).

Statistical analysis

Data analysis was carried out using SPSS version 20. To assess the construct validity of the questionnaire, we calculated the Spearman between the score of each dimension with its items. Cronbach's alpha was calculated as a sign of internal consistency and reliability. Cronbach's alpha is acceptable when it is greater than 0.7 and is good when greater than 0.8, and is considered excellent when greater than 0.9 (14). Results were compared with similar studies in Persian health staff. Correlation between scores in each of the sub-scales with hours working in COVID-19 special wards was also calculated.

Results

Of 87 participants, 25.3% were male, and 74.7% were female. The mean age was 30.86 (SD=0.63). No significant difference ($P=0.11$) was seen considering mean age between nurses (mean=29.83, SD=0.66) and physicians (mean=31.84, SD=1.05). The majority of participants were married (56.43%, N=49). 11.5% (N=10) of them had used antidepressant drugs during the COVID-19 outbreak. More data could be seen in Table 1.

Psychometry

Construct validity was measured by the Spearman correlation coefficient between each item with its own dimension, and it was greater than 0.4 for all items and statistically significant. Internal consistency was assessed by calculating Cronbach alpha for each dimension; it was 0.84, 0.80, and 0.79 for EE, DP, and PA, respectively.

Burnout results

Mean score was 27.07 (SE=0.94), 10.40 (0.63) and 24.21 (SE=0.71) for EE, DP and PA respectively. Scores in all three dimensions were compared in nurses and

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physicians, except in EE, physicians were more burned out. Results could be seen in Table 2.

We assessed the correlation between hours working in COVID-19 wards and scores in the three dimensions of maslach burnout inventory. Spearman's correlation coefficient was calculated, and we found that there is no correlation between subscales and working hours in the

nurse group. But in physicians, EE and DP were correlated with hours working in the COVID-19 ward. The latter correlation was statistically significant (Table 3).

Considering gender and marital status, there was no difference in any of the three dimensions between males and females or married and single participants.

Table 1. general data of study groups; nurses and physicians were compared using t-test

| | Nurses | Physicians | P | All participants |
|-------------------------------------|----------------|--------------|--------|------------------|
| Mean age (SE) | 29.83 (0.66) | 31.84 (1.05) | 0.11 | 30.86 (0.63) |
| Hours working in COVID-19 wards(SE) | 131.75 (17.72) | 80.02 (8.59) | 0.01* | 104.96(9.82) |
| Years of experience (SE) | 3.98 (0.96) | 8.62 (0.95) | 0.002* | 6.91 (0.75) |

Table 2. Mean score of each dimension of maslach burnout inventory in the study groups, nurses and physicians were compared using t-test

| | Nurses | Physicians | P | All participants |
|-----------------------------|--------------|--------------|---------|------------------|
| Emotional exhaustion (SE) | 26.40 (1.32) | 27.69 (1.36) | 0.49 | 27.02 (0.94) |
| Depersonalization (SE) | 8.28 (0.87) | 12.66 (0.75) | <0.001* | 10.40 (0.62) |
| Personal accomplishment(SE) | 25.62 (1.02) | 22.71 (0.95) | 0.04* | 24.21 (0.71) |

Table 3. Correlation between hours working in COVID-19 wards and the three dimensions of maslach burnout inventory. The correlation was measured using Spearman's correlation coefficient

| | | Correlation with hours working in COVID-19 wards | P |
|------------|-------------------------|--|--------|
| Physicians | Emotional exhaustion | 0.54* | <0.001 |
| | Depersonalization | 0.43* | 0.004 |
| | Personal accomplishment | -0.13 | 0.41 |
| Nurses | Emotional exhaustion | -0.11 | 0.44 |
| | Depersonalization | -0.29 | 0.05 |
| | Personal accomplishment | 0.14 | 0.36 |

Discussion

Coronavirus, which suddenly became a global disease, has put a lot of pressure on the health systems of different countries because of a high rate of transmission and high mortality. Different countries have faced shortages in terms of providing personal protective equipment at the community level and for the use of medical staff. Providing special wards, ventilators, and hospital facilities became a challenge due to the sudden increase in the number of patients (15). Also, due to the increase in the need for services, despite the fact that the workforce was not increased, a lot of pressure was put on health personnel to increase their workload or use them in COVID-19 special wards even when they do not have enough experience in that field. This issue, and the fact that health care workers are at the forefront to fight COVID 19 and have an increased risk of exposure to high viral load and becoming infected, puts a lot of pressure on

them that job fatigue is a predictable issue (16-19).

Few studies have been done to investigate burnout levels in health care providers during COVID-19 breakout. Yuan Wu *et al.*, conducted a study on health care providers in china during the COVID-19 pandemic. They concluded that the entire health care system is impacted by COVID-19. They also compared burnout in the frontline wards and usual wards and found that burnout frequency was higher in the usual ward. They suggested several explanations for this, and one possibility is that health care providers have a sense of control of their situation in frontline wards (3).

In this study, we used Maslach burnout inventory as an instrument to measure burnout in health staff during the COVID-19 outbreak. To find out if the work overload caused by the COVID-19 outbreak has increased burnout in physicians and nurses working in COVID-19 special wards, we compared our results with results of another study done in a similar population (health staff in Iran)

before the COVID-19 pandemic (by Moalemi S *et al.*) using a one-sample *t*-test. We found that health staff in our study showed a higher level of burnout in all three dimensions in maslach inventory, including EE (mean difference 6.78, $P<0.001$), DP (mean difference 2.21, $P<0.001$), and PA (mean difference -8.90, $P<0.001$) in comparison with the previous study (6).

According to our study results, physicians showed higher level of burnout in comparison with nurses. More studies with more participants are needed to confirm that physicians are more affected. But one bias could be because of level of experience. When we assessed the correlation between burnout dimensions and years of experience we found that there is no significant correlation between EE and experience but Spearman's correlation coefficient was 0.46 ($P=0.005$) and 0.347 ($P<0.001$) for DP and PA respectively. As mentioned before the difference between burnout level in nurses and physicians is significant in DP and PA dimensions but not EE. This suggests a potential role for experience in burnout. This means that employing experienced staff in times of crisis will help reduce job burnout. Since the main health care workers on the frontlines in Iran are inexperienced residents and young doctors and nurses, this can lead to more burnout in the health care providers facing high

We also demonstrated that, the more time physicians spent time in COVID-19 special wards, the higher burnout level is expected in EE and DP dimensions. We didn't find such correlation in nurses.

This study was done in two referral hospital in which all health care workers had to spend part of their time working in COVID-19 special wards, so the study lacks a control group. We compared our results with previous studies conducted in normal situation (6). The other limitation is that we used a small group size. In future, more studies on this topic is needed to confirm these results.

Burnout during health crisis such as COVID-19 pandemic in health care providers is an important issue that should be considered In order to increase the efficiency of the health system in the face of crises.

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