Research Article / Özgün Araştırma

DOI: 10.4274/cayd.galenos.2022.43255
J Pediatr Emerg Intensive Care Med 2023;10:97-103

# Evaluation of the Burnout Levels of Health Care Workers During the Pandemic in Pediatric and Adult Emergency Services

## Çocuk ve Yetişkin Acil Servislerinde Pandemi Süresince Sağlık Çalışanlarının Tükenmişlik Düzeylerinin Değerlendirilmesi

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## Abstract

**Introduction:** During the Coronavirus disease-2019 (COVID-19) pandemic, the emergency services provide seven days/24-hour regular health care, while the risk of burnout is gradually increasing among healthcare workers struggling with the increasing workload. Few studies monitored the mental health of doctors, nurses, and allied health personnel working in emergency departments to support frontline health workers and more data is needed.

**Methods:** The Maslach burnout scale (MBI) was administered voluntarily to doctors, nurses, and allied health personnel in the pediatric emergency and adult emergency services in May 2020 and December 2020. A socio-demographic information form containing questions about the institution, profession, and working conditions was distributed. The socio-demographic data of the same participants on both dates were compared with the effects of the pandemic on their daily lives, working conditions, and subscales of MBI (emotional exhaustion, depersonalization, and personal achievement scores) with an interval of six months (May 2020-December 2020).

**Results:** One hundred seventeen health personnel participated in our study in May 2020 and 122 in December 2020. 95.7% of respondents (112/117) in May 2020; in December 2020, 69.9% (84/122) of them met the criteria in two or more of the subscales of MBI (high emotional exhaustion and depersonalization scores, low personal achievement scores) and were found to be exhausted. In a six-month comparison, it was found that physicians, among physicians, pediatric assistants working in the pediatric emergency department, and healthcare workers aged 29 and younger were better able to cope with burnout.

**Conclusion:** Considering the known harmful effects of burnout on patient care and the well-being of healthcare workers, frontline personnel in emergency services may need more mental support during and after the COVID-19 pandemic. There is a need for more preventive, descriptive, protective, and remedial studies on frontline health workers' physical and mental health.

**Keywords:** Burnout, emergency department, pandemic, wellness

## Öz

**Giriş:** Koronavirüs hastalığı-2019 (COVID-19) pandemisinde acil servisler limitsiz, 7 gün/24 saat düzenli sağlık hizmeti verirken, artan iş yükü ile ön saflarda mücadele eden sağlık çalışanları üzerinde tükenmişlik riski giderek artmaktadır. Acil servislerde çalışan doktor, hemşire ve yardımcı sağlık personelinin ruhsal sağlığını gözlemleyerek ve ön saflardaki sağlık çalışanlarını desteklemek için yapılan çok az çalışma vardır ve daha fazla veri ihtiyacı vardır.

**Yöntemler:** Çocuk acil servisi ve erişkin acil servisinde çalışan doktor, hemşire ve yardımcı sağlık personeline Mayıs 2020 ve Aralık 2020 tarihinde gönüllülük esasına dayalı bir şekilde Maslach tükenmişlik ölçeği (MTÖ) uygulandı. Kurum, meslek ve çalışma koşulları ile ilgili soruları içeren sosyo-demografik bilgiler formu ile dağıtıldı. Her iki tarihte aynı katılımcıların sosyo-demografik verileri ile, pandeminin günlük yaşamları, çalışma koşulları ve MTÖ'nün alt ölçekleri üzerindeki (duygusal tükenme, duyarsızlaşma ve kişisel başarı puanları) üzerindeki etkileri altı ay (Mayıs 2020-Aralık 2020) ara ile karşılaştırıldı.

**Bulgular:** Mayıs 2020'de toplam 117, Aralık 2020'de 122 sağlık personeli çalışmamıza katıldı. Mayıs 2020'de katılımcıların %95,7'si (112/117); Aralık 2020'de ise %69,9'u (84/122) MTÖ'nün alt ölçeklerinden iki veya daha fazlasında (duygusal tükenme ve duyarsızlaşma puanlarının yüksek, kişisel başarı puanı düşük) ölçütleri karşılamış ve tükenmiş olarak bulundu. Altı ay ara ile yapılan karşılaştırmada, doktorların, doktorlar içinde ise çocuk acil servisinde çalışan pediyatri asistanlarının, 29 yaş ve altındaki sağlık çalışanlarının tükenme ile daha iyi başa çıkabildiği saptandı.

**Sonuç:** Tükenmişliğin hasta bakımı ve sağlık çalışanlarının refahı üzerindeki bilinen zararlı etkileri düşünüldüğünde, acil servislerde ön saflarda çalışan personelin COVID-19 pandemi döneminde ve sonrasında daha fazla ruhsal desteğe ihtiyacı olabileceğini düşünmekteyiz. Ön saflarda görev alan sağlık çalışanlarının hem fiziksel hem de ruhsal sağlığı konusunda daha fazla önleyici, tanımlayıcı, koruyucu ve iyileştirici çalışmalara ihtiyaç vardır.

**Anahtar Kelimeler:** Tükenmişlik, acil servis, pandemi, iyilik hali

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**Received/Geliş Tarihi:** 06.11.2021 **Accepted/Kabul Tarihi:** 09.05.2022

## Introduction

The Coronavirus disease-2019 (COVID-19) which caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) has resulted in high morbidity and mortality around the world since December 2019. Previous studies showed that the prevalence of psychological risks that could affect physical and mental health is high in conditions associated with changes in working conditions.[1] Therefore, all physicians and other health care workers who especially work in the emergency departments (ED) at the front line of care are the greatest risk of burnout since the beginning of COVID-19 pandemic.

Burnout or burnout syndrome is defined as the detachment of the profession from the original meaning and purpose of the profession and the fact that it is no longer interested in the people it serves, or the person's psychological withdrawal from his job in response to excessive stress and dissatisfaction.[2] Increasing studies on burnout of physicians and other healthcare workers have increased awareness of this issue and its impact on quality of care for patients and the quality of life of service providers.[3,4] Important studies conducted for many years have showed that the risk of extinction is higher in professions that work with people such as physicians and nurses compared to other professions.[5]

COVID-19 has disrupted the world and emergency medicine physicians are at the greatest risk of further health related and psychological injury.[6]

A survey study indicated a high prevalence of mental health symptoms such as depression and anxiety among health care workers treating patients with COVID-19 at the beginning of pandemic in China. Therefore, they draw attention to health care workers' need for mental well-being and special interventions which need to be implemented immediately. Because long-term health effects of burnout due to COVID-19 for health care workers could be a significant concern during and after pandemic.[7]

In this study, we aimed to define the frequency of burnout at the beginning of pandemic and to observe variation of burnout frequency over time during the pandemic among in pediatric and adult emergency medicine staff who work in our university hospital.

## Materials and Methods

In our study, physicians (pediatric residents who work in pediatric emergency and adult emergency residents), nurses and other health care workers (environmental service staff, administrative staff) who work at our children's hospital and the adult emergency department participated as volunteers to the study. This study was conducted using survey methodology in May 2020 and December 2020 at same individuals in two time periods in the study. Thirty-four emergency residents, forty-seven nurses, fifteen environmental service staff, twenty-five administrative staff (total 121) worked in our ED. Fifty pediatric residents, twenty nurses, thirteen environmental service staff, sixteen administrative staff (total 99) worked in our PED during the study period. The Local Ethical Committee of Hacettepe University approval was received (no: 2020/09-28, date: 05.05.2020).

Physicians, nurses, and other health care workers who were in the main staff of the emergency department and had least 3 months of working experience in the emergency department were included in the study. Physicians, nurses, and health care workers who worked in the emergency department for less than 2 months, temporarily workers during the pandemic period were excluded from the study.

In this study, the effects of the pandemic on the lives, emotional exhaustion (EA), depersonalization (DP), and personal accomplishment scores of the volunteers were compared in May (earlier period of pandemic) and December (six months later as a second period). A cover letter and information sheet stated the purpose of the survey, as well as an explanation that participation was optional and that the responses would be anonymous. Information of all participants that may be related to socio-demographic and burnout evaluated together with the Maslach burnout scale. Turkish version of the Maslach burnout inventory (MBI) for healthcare personnel was applied for the first time in 1996 among 7.255 healthcare workers and was adapted (Turkish version) by preserving its original structure.[8] MBI was consisted of twenty-two questions and three major subscales. These subscales were EA, DP and decreased personal accomplishment (PA). EA was decided according to questions number 1,2,3,6,8,13,14,16,20 (total nine question), DP was decided according to questions 5,10,11,15,22 (5 questions) and decreased personal accomplishment was evaluated by questions 4,7,9,12,17,18,19,21 (8 questions). In three subscales burnout was graded as low, moderate, and high. Points according to these subscales are for EA; low <11, moderate 12-17 and high ≥18 points, for DP low <5, moderate 6-9, high ≥10 points and for personal accomplishment; low ≥26, moderate 22-25, high 0-21 points. Grades of EA and DP was increased by increasing points, for personal accomplishment by decreasing points burnout was increasing. In the current study, in general burnout was defined as the ones who get at least ≥18 points from MBI and low grade of burnout was ones who get 0-11 points from inventory.[8] Burnout defined as to high levels of both DP, EE, and low levels of PA and as the presence of at least two of these subscales.

### Statistical Analysis

IBM SPSS Statistics 23 program was used for statistical analysis. While evaluating the study data, Student's t-test was used for comparing the descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum, maximum) as well as two groups of variables that showed a normal distribution, chi-square test was used to compare categorical variables. Mann-Whitney U test and Wilcoxon test used for two groups of variables that did not show normal distribution. Pearson correlation analysis and Spearman correlation analysis were used to evaluate the relationships between variables. The threshold for statistical significance was set to $p<0.05$.

## Results

In May 2020, total 117 staff (53% of all workers) participated in the study. The mean age was 30.8 years and age range of the participants was 23-49 years. Fifty-three percent of the participants were female. According to MBI, respondents averaged a score of 13.4 [95% confidence interval (CI) 12.5 to 14.3], 31 (95% CI 29.7 to 32.3), and 26.7 (95% CI 25.6 to 27.8) in the subscales of DP, EA, and personal accomplishment.

The distribution of healthcare workers was 35.9% pediatric resident, 27.4% environmental service staff and administrative staff,18.8% nurses, 17.9% emergency medicine resident. 51.3% of the participants were single/divorced**,** 48% of participants were married.16.2% of the participants had a chronic illness (Table 1). Weekly working hours among in all health care workers was 55 hours a week on average. The time spent on social media was found as 1.8 hours per day, 68% of the responders made major changes in home order (Table 2). In May 2020 7.7% of participants got infected COVID-19 or under isolation. Forty seven percent of participant got COVID-19 sample. When the MBI subscales were analyzed, it was found that 78.6% of all participants working during the first pandemic period got higher scores EE and DP (Table 3). According to gender, 99.1% of the women had high level of EA. While 83.8% had high level of DP, only 16.1% had low level of personal accomplishment. Ninety-point nine percent of the men were burnt out and 98.1% of men had high level of EA. While 69% of them had high level of DP, only 21.8% of men had low level of personal accomplishment. According to age, percentage of the high-level EA aged ≤29 was 98.1%, 81.9% for high level of DP, 13.1% for low level of personal accomplishment. For aged ≥30 years, percentage of the high-level EA aged ≤29 was 100%, 71.4% for high level of DP, 25% for low level of personal accomplishment. According to the marital status, percentage of the high-level EA for the single/divorced 98.3%, 78.3% for high level of DP, 8.3% for low level of personal accomplishment. Percentage of the high level of EA in married participants was 100%, 75.4% for high level of DP, 29.8% for low level of personal accomplishment. The percentage of high level of EA for physicians was 98.4%, high level of DP was 79.6%, and low level of personal accomplishment was 17.4%. The percentage of high level of EA for non-physician personnel 100%, high level of DP was 74%, and low level of personal accomplishment was 20.3%. According to their specialization, the percentage of high level of EA of pediatric residents was 97.6%, high level of DP was 78.5%, and low level of personal accomplishment was 16.6%. The percentage of high level of EA of adult emergency medicine residents was 100%, high level of DP was 80.9%, and low level of personal accomplishment was 19% (Table 3).

In December 2020, 122 people participated in the study. The average age was 29.8 years, the age range of the participants was 23-47 years. Respondents averaged a score of 12.5 (95% CI 11.7 to 13.3), 27 (95% CI 25.5 to 28.5), and 27.1 (95% CI 25.8 to 28.5) in the subscales of DP, EA, and personal accomplishment. 52.5% of the participants were female. The distribution of healthcare workers was 34.4% pediatric residents, 28.6% environmental service staff and administrative staff, 22.2% nurses, 14.8% adult emergency medicine residents. 58.2% of the participants were single/divorced, 41.8% of participant was married and 11.5% of the participants had a chronic illness (Table 1). Weekly working hours among in all health care workers increased to 55 hours a week on average. The time spent on social media was found as 3.3 hours per day. Fifty percent of the responders made major changes in home order (Table 2). In December 2020, 67.2% of participants got infected SARS-CoV-2 or under isolation. 91.8% of participant got COVID-19 sample. According to gender, 81.2 of the women had high level of EA. While 76.5% had high level of DP, only 18.7% had low level of personal accomplishment. eighty one percent of the men were burnt out and 87.9% of men had high level of EA. While 86.2% of them had high level of DP, only 13.7% of men had low level of personal accomplishment. According to age, percentage of the high-level EA aged ≤29 was 81.3%, 82.6% for high level of DP, 18.6% for low level of personal accomplishment. For aged ≥30 years, percentage of the high-level EA aged ≤29 was 89.3%, 78.7% for high level of DP, 17% for low level of personal accomplishment. According to the marital status, percentage of the high-level EA for the single/divorced 78.8%, 80.2% for high level of DP, 15.4% for low level of personal accomplishment. Percentage of the high level of EA in married participants was 92.1%, 84.3% for high level of DP, 17.6% for low level of personal accomplishment. The percentage of high level of EA for physicians was 76.6%, high level of DP was 78.3%, and low level of personal accomplishment was 21.6%. The percentage of high level of EA for non-physician personnel 91.9%, high level of DP

was 83.8%, and low level of personal accomplishment was 11.2%. According to their specialization, the percentage of high level of EA of pediatric residents was 73.8%, high level of DP was 78.5%, and low level of personal accomplishment was 28.5%. The percentage of high level of EA of adult emergency medicine residents was 83.3%, high level of DP was 77.7%, and low level of personal accomplishment was 27.7% (Table 3). Burnout was found 75.4% in of our respondents in the second pandemic period.

The decreasing weekly working hours and increasing social media usage of the participants evaluated with 6-month intervals changed significantly. Burnout rates were significantly decreased in the whole group in December 2020 compared to May 2020 ($p<0.05$). During this period, the positive test results of COVID-19 or the rate of those who stayed in isolation increased from 7.7% to 67.2% ($p<0.05$).

Analyzing at the Maslach burnout sub-score (high level of EE, DP, and low level of PA); EA scores of men, women, age 29 and under, doctors and pediatric residents were found to be significantly decreased within 6 months period ($p<0.05$). There was no significant relationship between personal accomplishment and DP subscale score changes (Table 3).

When the participants were evaluated demographically, while the EA rates were significantly decreased in women ($p=0.001$), 30 years and older ($p=0.044$), single/divorced ($p=0.001$), doctors ($p=0.001$) and pediatricians ($p=0.02$), in contrast EA increased in those under 29 years ($p=0.02$). In the men ($p=0.025$) and non-physician group ($p=0.026$) DP increased significantly. There was no significant change in personal achievement rates (Table 3).

**Table 1. Demographic features of health care providers**

| | May 2020 | December 2020 |
|---|---|---|
| | n (%) | n (%) |
| **Age groups (years)** | | |
| 25-29 | 61 (52.1) | 75 (61.5) |
| 30-34 | 31 (26.5) | 20 (16.4) |
| 35-39 | 12 (10.3) | 13 (10.7) |
| ≥40 | 13 (11.1) | 14 (11.5) |
| **Gender** | | |
| Female | 62 (53.0) | 64 (52.5) |
| Male | 55 (47.0) | 58 (47.5) |
| **Health care providers** | | |
| Physicians | 63 (53.8) | 60 (49.2) |
| Adult emergency medicine resident | 21 (17.9) | 18 (14.8) |
| Pediatric resident | 42 (35.9) | 42 (34.4) |
| Nurse | 22 (18.8) | 27 (22.2) |
| Other health care worker | 32 (27.4) | 35 (28.6) |
| **Marital status** | | |
| Single/divorced | 60 (51.3) | 71 (58.2) |
| Married | 57 (48.7) | 51 (41.8) |
| **Any chronic diseases** | | |
| Yes | 19 (16.2) | 14 (11.5) |
| No | 98 (83.8) | 108 (88.5) |
| **Homeowner** | | |
| Host | 60 (51.3) | 66 (54.1) |
| Rent | 57 (48.7) | 56 (45.9) |
| **If staff married, their spouse's job (n=60)** | | |
| Physician | 11 (18.3) | 9 (17.6) |
| Nurse | 4 (6.7) | 5 (9.8) |
| Environmental service staff, administrative staff | 6 (10.0) | 1 (2.0) |
| Not health care worker | 39 (65.0) | 36 (70.6) |
| **Child owner** | | |
| No | 78 (66.7) | 85 (69.7) |
| Yes | 39 (33.3) | 37 (30.3) |

**Table 2. The effects of pandemic on participants lives and burnout rates**

| | May 2020 | December 2020 |
|---|---|---|
| **Weekly working hours** | **55±17*⁺** | **44±9*⁺** |
| **Time on social media (hours)** | **1.8±1.6*⁺** | **3.3±1.3*⁺** |
| | **n (%)** | **n (%)** |
| **Where was the department you worked in the previous month?** | | |
| Pediatric emergency department | 25 (21.4) | 10 (8.2) |
| Emergency department | 46 (54.7) | 62 (50.8) |
| Not emergency department | 46 (39.3) | 50 (41.0) |
| | **n (%)** | **n (%)** |
| **Have any problems with your child's care?** | | |
| No | 21 (56.8) | 25 (46.6) |
| Yes | 16 (43.2) | 31 (55.4) |
| **Have you used a permit in the past 3 months?** | | |
| No | 107 (91.5) | 83 (68.0) |
| Yes | 10 (8.5) | 39 (32.0) |
| **Did your salary decrease during pandemic?** | | |
| No | 69 (59.0) | 51 (41.8) |
| Yes | 48 (42.0) | 71 (58.2) |
| **Did you get COVID-19 PCR sample during the pandemic period?** | | |
| No | **62 (53.0) *** | **10 (8.2) *** |
| Yes | **55 (47.0) *** | **112 (91.8) *** |
| **You or anybody lived with you got infected with COVID-19? And Did you get under isolation?** | | |
| Yes | **9 (7.7) *** | **82 (67.2) *** |
| No | **108 (92.3) *** | **40 (32.8) *** |
| **Has there been any changes in home life and daily routine?** | | |
| Yes | 68 (58.1) | 61 (50.0) |
| No | 49 (47.9) | 61 (50.0) |

*: $p<0.05$, statistically significant, ⁺: mean ± SD, SD: Standard deviation, PCR: Polymerase chain reaction, COVID-19: Coronavirus disease-2019

**Table 3. Evaluation of changes between burnout rates and Maslach burnout scale sub-scores**

| | | Burnout | | | High Level of EE | | | High Level of DP | | | Low Level of PA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dec-20 n (%) | p* | May-20 n (%) | Dec-20 n (%) | p* | May-20 n (%) | Dec-20 n (%) | p* | May-20 n (%) | Dec-20 n (%) | p* | May-20 n (%) |
| **All participants** | | 92 (78.6%) | 92 (75.4%) | 0.554 | 116 (99.1%) | 103 (84.4%) | **0.001** | 90 (76.2%) | 99 (81.1%) | **0.04** | 22 (18.8%) | 20 (16.3%) | 0.81 |
| **Gender** | **Women** | 54 (87%) | 45 (70.3%) | 0.022 | 62 (100%) | 52 (81.2%) | **0.001** | 52 (83.8%) | 49 (76.5) | 0.278 | 10 (16.1%) | 12 (18.7%) | 0.277 |
| | **Men** | 38 (90.9%) | 47 (81%) | 0.142 | 54 (98.1%) | 51 (87.9%) | 0.101 | 38 (69%) | 50 (86.2%) | **0.025** | 12 (21.8%) | 8 (13.7%) | 0.374 |
| **Age** | **29 and under** | 50 (81.9%) | 57 (76%) | 0.398 | 60 (98.3%) | 61 (81.3%) | **0.02** | 50 (81.9%) | 62 (82.6) | 0.273 | 8 (13.1%) | 14 (18.6%) | 0.451 |
| | **30 and over** | 42 (75%) | 35 (74.4%) | 0.951 | 56 (100%) | 47 (89.3%) | **0.044** | 40 (71.4%) | 37 (78.7%) | 0.170 | 14 (25%) | 8 (17%) | 0.468 |
| **Marital status** | **Married** | 44 (77.1%) | 40 (78.4%) | 0.877 | 57 (100%) | 47 (92.1%) | 0.098 | 43 (75.4%) | 43 (84.3%) | 0.236 | 17 (29.8%) | 9 (17.6%) | 0.336 |
| | **Single/ divorced** | 48 (80%) | 52 (73.2%) | 0.364 | 59 (98.3%) | 56 (78.8%) | **0.001** | 47 (78.3%) | 57 (80.2%) | 0.155 | 5 (8.3%) | 11 (15.4%) | 0.412 |
| **Profession** | **Physician** | 51 (80.9%) | 43 (71.6) | 0.225 | 62 (98.4) | 46 (76.6%) | **0.001** | 50 (79.6%) | 47 (78.3%) | 0.889 | 11 (17.4%) | 13 (21.6%) | 0.635 |
| | **Non-physician** | 41 (75.9%) | 49 (79%) | 0.689 | 54 (100%) | 57 (91.9%) | 0.103 | 40 (74%) | 52 (83.8%) | **0.026** | 11 (20.3%) | 7 (11.2%) | 0.398 |
| **Area of expertise** | **Pediatric resident** | 34 (80.9%) | 30 (71.4%) | 0.306 | 41 (97.6%) | 31 (73.8%) | **0.02** | 33 (78.5%) | 33 (78.5%) | | 7 (16.6%) | 12 (28.5%) | 0.142 |
| | **Emergency resident** | 17 (80.9%) | 13 (72.2%) | 0.519 | 21 (100%) | 15 (83.3%) | 0.089 | 17 (80.9%) | 14 (77.7%) | 0.807 | 4 (19%) | 5 (27.7%) | 0.302 |

*p<0.05, statistically significant, EE: Emotional exhaustion DP: Depersonalization, PA: Personal accomplishment

## Discussion

In this study, the burnout rate was found 78.6% among in all participants during the earlier period of COVID-19 pandemic. Whereas its rate was found 75.4% during the second period. When the working groups separately analyzed, the burnout rate was found 80.9% in pediatric residents and in adult emergency medicine residents. After six months of this first evaluation during pandemic, 71.4% in pediatric resident and 72.2% in emergency medicine residents. These results show that healthcare personnel working in pediatric and adult ED were trying to cope with burnout in the progression of the pandemic, and they were successful to a small degree. However, the experience of burnout among physicians decreased over time, but burnout rates among non-physician workers continued to rise.

Studies on burnout among physicians have increased awareness of physician mental health and well-being in the recent years. However, the methodological heterogeneity among studies and different definitions of burnout cause to difficulty for estimation of its prevalence and interpretation of their results.[9-13] Previous studies showed that the prevalence of burnout among emergency medicine physicians at the front line of care access are at greatest risk when compared with other specialties. All physicians are most sensitive to burnout because of longer working hours, higher levels of education, and unbalanced between work and life integration than other workers.[14] In a study about describing the rates of burnout, depression and suicidality among in EM physicians in Canada before the COVID-19 pandemic, it was shown that 86.1% of 384 respondents met at least one of the burnout criteria, 14.3% had idea about attempting suicide while working in the ED. Five point nine percent of the participants had actively thought about suicide in the last year.[9] Authors concluded that EM physicians should be monitored for physical and mental risks even before the pandemic.[9] Other two different studies showed that 39.1% of pediatric residents and 70.4% in emergency medicine residents burned out.[10,11] There are also studies showing that burnout of employees in the ED starts earlier and varies between 65-74%.[12,13] In a meta-analysis to characterize the methods used to assess burnout and provide an estimate of the prevalence of physician burnout, the frequency of burnout among physicians was found 67%.[15]

EA is the most widely reported but it is not considered as a sufficient criterion in some previous studies.[11] In these studies, moderate to high scores in both EE and DP or low to moderate levels of PA were used to indicate burnout for being more comprehensive definition of burnout. In our study, we observed that the most important subscale of burnout was found as EA. If we defined burnout using only a high level of EE as being in previous studies, the frequency of burnout was

found 99.1% in our population. Interestingly, most affected subscale of burnout was also EE especially in women, 30 years and older, single/divorced, doctors and pediatricians. But there was no significant decrease in DP and PA. Notably, DP increased significantly in males and in the non-doctor group.

In our study, burnout rates in all participants were found higher in earlier period of pandemic. On the other hand, it was found burnout rates decreased in all participants after six months. The reasons of these results could be associated with significantly decreasing of improper usage of ED during the pandemic, increasing of scientific information about COVID-19 and its treatment, adaptation to safety rules and usage of personal protective equipment and increasing vaccine trial studies. Additionally, weekly working hours of the participants was shown significantly decrease because of ensuring of limited contact period with infected individuals. Conversely, the time spent in social media increased during the six months period. The reason of the increase in the use of social media may be related to follow global developments and news about COVID-19 more closely. Because increasing of social media usage can also be a method of dealing with stress or an instrument for filling free times. In addition to these possible explanations, improvement of burnout frequency in pediatric residents in six months can be explained by less severe symptoms in children with COVID-19.

Long-term health effects for those working on the front lines due to COVID-19 during and after the pandemic should be a major concern for governments, hospitals and doctors.[9] Healthcare workers are considered to have a high risk of burnout or psychological conditions due to the COVID-19 outbreak.[16] Previous studies showed that health care workers feared contagion of their family and colleagues and reported experiencing high levels of stress, anxiety and depression symptoms during pandemics.[17,18] In a study from China, it was shown that a significant proportion of participants experienced anxiety, depression, and insomnia symptoms, and more than 70% reported psychological distress.[7] Sources of distress of health care workers in an epidemic of infectious diseases may include feelings of vulnerability or loss of control and concerns about health of self, spread of virus, health of family and others, changes in work, and being isolated.[13] Long-term effects are including increased substance abuse, depression and suicidal ideation.[3] Studies have indicated a risk of depression, anxiety, and mental health complaints in the frontlines in China during the early days of COVID-19.[7] Therefore, these conditions need to be continuously monitored and responded in a timely manner to improve the preparedness of health care systems to protect the health of professionals and face the medium and long-term consequences of the epidemic. Timely and effective psychological support and prevention preparedness interventions are essential to ensure the sustainability of a resilient workforce in the long run of a global pandemic while moving quickly. Therefore, the most important step is recognition and prevent depletion during the pandemic period. Other suggestions could be reducing the factors that may put pressure on healthcare working time, establishing a balance between work life and private life, acquiring hobbies to ease itself. On the other hand, the implementation of methods of coping with burnout developed institutionally will yield more effective results.

### Study Limitations

Our study has some limitations. First, our study was a single center and the response rate among health care workers who received an invitation to participate in the study was 53%. Second, burnout rates among in our emergency department staff before the pandemic were unknown.

The limitation of our study is that it was single-center, and the pre-pandemic burnout levels were not known. Although the questionnaires were applied to same individuals in two time periods in the study, the number of people participating in the research could not be the same. We could not find and remove five volunteers who did not participate in the study in May 2020 because the surveys were anonymous.

## Conclusion

Most of emergency medicine staff at earlier period of the pandemic had concerned burnout. However, this rate decreased over the time. Although it is not known burnout rates before the pandemic, this improvement is important for frontline workers who are responsible public health. For protecting health care workers exposed to COVID-19 as an extra, special interventions should be taken into consideration.

**Information:** It has been accepted as an oral presentation for the 30 April-1 May 2021 Pediatric Emergency Medicine and Intensive Care Online Seminars.

**Acknowledgement:** We would like to thank all the healthcare workers who lost their lives in the pandemic.

### Ethics

**Ethics Committee Approval:** The Ethics Committee approval from Hacettepe University Faculty of Medicine was provided for this study (GO 20/430).

**Informed Consent:** Informed consent was obtained.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: E.G., Design: E.G., O.A., Ö.T., Data Collection or Processing: E.G., O.A., N.M.A., Analysis or Interpretation: E.G.,

O.A., N.M.A., Ö.T., Literature Search: E.G., O.T., Writing: E.G., O.A., N.M.A., Ö.T.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

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