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# Burnout among physicians working in a pandemic hospital during the COVID-19 pandemic

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## ABSTRACT

This study aimed to investigate burnout among physicians during the first phase of the COVID-19 pandemic. This research was conducted in a pandemic hospital which is among the largest hospital complexes in Turkey. Internal medicine physicians actively working in many departments under the severe conditions in the diagnosis and treatment processes were included. Among the physicians constituting the study population, residents, attendings, and subspecialists from different fields were included. These physicians were working in the quarantine services, inpatient services, intensive care units, and polyclinics. A short and easy face-to-face survey, in which included questions on demographic information, medicolegal subjects, and questions from the Maslach Burnout Inventory, was used to collect data. While 58.2% of the physicians stated that they were extremely worried about malpractice in the pandemic period, 82.1% stated they needed training on medicolegal subjects, and 25.4% stated they were exposed to violence during work. Three sub-dimensions within the burnout inventory were compared with other parameters. The Cronbach alpha value was found highly reliable in the evaluation of the answers' internal consistency. The notable significance of burnout was interesting regarding physicians' anxiety on medicolegal issues and exposure to violence ( $p < 0.05$ ). The findings obtained in this study suggest that healthcare workers' motivations will increase if they feel valued, their working conditions have been improved, and if they are in mentally well. This mental wellness may contribute to fighting public health crises such as a pandemic more efficiently with the lowest number of casualties.

## 1. Introduction

“Staff burnout”, which was presented by Freudenberger in 1974, is the condition of burnout in the individual's energy due to failure, wear-out, overloading, and unfulfilled desires [1]. Maslach, the developer of the Maslach Burnout Inventory, stated that burnout occurs in three different conditions as Emotional Exhaustion, Depersonalization, and Personal Accomplishment and evaluated burnout in three separate dimensions [2]. Maslach and Jackson emphasized that burnout occurs especially in individuals working with others, and medicine is among the fields constituting the highest burnout risk [3].

The causes of burnout are evaluated under two titles as personal and organizational. Personal causes are causes, such as marital status, age, number of children, devotion to work, expectations, and motivation. Organizational causes included causes, such as the quality of work, institution type, weekly working duration, workload, work stress, intra-

organizational relations, and socio-economic causes [4]. Healthcare professionals work under intense workload, irregular working hours, and care for terminally ill patients. Some reasons, such as empathizing with the patients/relatives, taking responsibility in case of uncertainty, and the necessity to follow the innovations, may cause stress and tension. Also, deficiencies in the healthcare system may cause these conditions [5].

On December 31, 2019, the Country Office of WHO for China reported pneumonia cases of unknown etiology in Wuhan Hubei province, China. On January 7, 2020, the causative agent was identified as a novel coronavirus (2019-nCoV) that has not previously been detected in humans. Later, the name of the 2019-nCoV disease was accepted as COVID-19. After the first COVID-19 cases were seen in China, the disease spread rapidly in other countries, and WHO declared the COVID-19 outbreak on March 11, 2020, as a pandemic [6]. Workloads of healthcare workers increase in pandemics; they take significant

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responsibilities and stay away from their families. Apart from these, they are also in the risky group in society. Thus, the burnout of healthcare workers in a pandemic is a subject that should be strictly emphasized. Burnout conditions of healthcare workers should be comprehended as a risk for the patients, society, and the healthcare system itself in addition to their health [7]. All internal medicine physicians, from residents to subspecialists, play a globally active role in diagnosis, follow-up, and treatment phases in the pandemic. Internal medicine is a specialty covering all fields of medicine; thus, it should be evaluated separately due to their exposures during the pandemic.

Medical malpractice claims in current practice have come to a serious problem for physicians worldwide in recent years. Current studies indicate that the burnout caused by a pandemic may lead to medical malpractice lawsuits, even an increase in the risk of patient safety [8,9]. In recent literature, there is information that during the COVID-19 pandemic, physicians' motivation and professional satisfaction decreased, and even suicidal thoughts increased [10]. It is stated that these stressful situations may impact negatively on patient care [11]. Although there is no direct association between pandemic and increased medical error rates, it is understood that the burnout caused by the pandemic conditions is the main factor. Thus, in the presence of physicians' burnout due to a pandemic, medicolegal concerns should also be examined. In addition to investigating the COVID-19 pandemic related burnout of physicians, this study aimed to examine their demographic characteristics and approaches on medicolegal issues.

## 2. Materials and methods

The study population was planned as internal medicine physicians working in University of Health Sciences, Tepecik Training and Research Hospital. Participants were chosen among the physicians who were actively working in the first phase of the COVID-19 pandemic when the conditions were in the most severe period. Off-duty physicians in the pandemic due to health problems or personal causes were excluded from this research. Then, we aimed to reach all the remaining physicians and no specific group has been selected. This study was started after taking ethics board approval, no 2020/5-6, dated 27/04/2020. In this cross-sectional study, data were collected between May 15 and 20, 2020. Survey forms prepared in advance were used as a data collection method. The surveys were applied face-to-face to all participants by the same researcher for the reliability of the answers. Participants were informed about this study, and their consent was taken before they filled in the survey. The identities of the physicians were not included in documents. A survey form consisting of two pages was given to the participants. The first page had six questions on demographic information and three questions on legal liability, while the second page had 22 questions from the Maslach Burnout Inventory (MBI).

All questions of the inventory contained statements, including a five-point Likert type (changing between "1-Never" and "5-Always") answer options. The inventory had three sub-dimensions, including Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). Scores were calculated separately for every sub-dimension. The higher the score obtained from the EE and DP sub-dimensions and the lower the score obtained from the PA sub-dimension; it is understood that the higher burnout experienced [2]. MBI adaptation study for the physicians and nurses in our country was performed in 1992 [12], and written consent was taken from the scale developer before starting this study.

The hospital where this study was performed was in the city of Izmir, located on the Aegean coast of the Republic of Turkey. Izmir is the third biggest city of the Republic of Turkey, with a population of 4.321 million people and is a cosmopolitan metropolis with a high socio-cultural level. This hospital is not only the biggest in the city of Izmir and is also among the most extensive health institutions of Turkey with 910 inpatient beds. It is also one of the first hospitals assigned as a "pandemic hospital" after the pandemic declaration. A total of 1100 physicians, including 74

internal medicine physicians, work in the hospital. Among these physicians constituting the study population, residents, general internal medicine attending physicians, and subspecialist attending physicians (intensive care, endocrinology, rheumatology, allergy and immunology, geriatrics, gastroenterology, hematology, oncology, and nephrology) were included.

Within a pandemic hospital, the treatment was provided in 11 quarantine services in addition to specialized infection service, critical intensive care service, adult intensive care service, and pediatric intensive care service. A restriction was not applied in polyclinic departments in the whole country within this period, but an urgency restriction was applied in surgical operations. Physicians examined ninety patients on average in each internal medicine polyclinic daily before the pandemic period (an average of 1170 patients per day). Twenty-five patients were examined on average daily in the pandemic period (an average of 325 patients per day). Within this period, internal medicine physicians also worked in the consultation department and disability council in addition to the inpatient services, intensive care units, and polyclinics. During the pandemic period, an average of 150 COVID-19 pre-diagnosed and 150 ordinary emergency patients' admissions were occurred to the emergency service, where an average of 500 admissions were occurred per day in the same period in the previous year.

### 2.1. Statistical analysis

Distribution of age and dimension scores was examined using the Shapiro-Wilk test and normality graphics. Variables with a normal distribution were summarized as mean  $\pm$  standard deviation (mean  $\pm$  sd), and variables without a normal distribution were summarized as median (minimum–maximum). Frequency (%) was given for categorical variables like gender.

A suitable chi-square test was used for analyzing categorical variables. While comparing the variables in the two groups, a *t*-test was used in independent samples for variables with normal distribution and balanced groups. Mann-Whitney *U* test or Kruskal-Wallis test was used for the other variables. The Bonferroni-Dunn correction was performed as a post hoc test at the end of the Kruskal-Wallis analysis. The consistency of the responses given to the scale was evaluated using the Cronbach  $\alpha$  coefficient. The answers were accepted as unreliable with Cronbach  $\alpha$  between 0.0 and 0.40, low reliable between 0.40 and 0.60, quite reliable between 0.60 and 0.80, and highly reliable between 0.80 and 1.00. The *p*-value was accepted as  $< 0.05$  for the statistical significance level.

For conducting the statistical analysis, IBM SPSS Statistics 22.0 (IBM Corp. Released 2013 IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) program was used.

## 3. Results

Sixty-seven physicians participated in this study; thus, we reached the entire of the aimed population. Due to its face-to-face application, shortness and easiness, the survey was interpreted to have reliable answers. Twenty-six (38.8%) of the physicians were male, and 41 (61.2%) were female. The mean age was  $34.7 \pm 9.2$  years (min–max: 24–65). Based on the marital status of the physicians, 41 (61.2%) were married, and 37 (55.2%) had children. Other demographical and professional characteristics of the physicians are presented in Table 1.

We examined the answers given to medicolegal questions based on demographic and working conditions. We detected that worrying about malpractice in the pandemic did not change according to demographics ( $p > 0.05$ , Table 2). In the evaluation based on marital status, the rate of married physicians feeling the need for training on medicolegal subjects was higher than the single physicians ( $p = 0.048$ ). Of the 67 physicians included in this study, 16 (23.9%) stated that they were exposed to verbal violence within this period, while one physician (1.5%) reported exposure to both verbal and physical violence. The violence exposure

**Table 1**  
Demographic information and answers to medicolegal questions.

Variables (n = 67)	n (%)	Variables (n = 67)	n (%)
<b>Gender</b>		<b>Duty</b>	
Male	26 (38.8)	Resident physician	32 (47.8)
Female	41 (61.2)	General attending physician	22 (32.8)
<b>Marital status</b>		Subspecialist attending physician	13 (19.4)
Married	41 (61.2)	<b>Place of duty</b>	
Single	26 (38.8)	Emergency Service	11 (16.4)
<b>Child status</b>		Polyclinic	24 (35.8)
None	37 (55.2)	Quarantine service	62 (92.5)
0–2 age	7 (10.4)	Intensive care	17 (25.4)
Nursery	9 (13.4)	<b>No additional stress</b>	41 (61.2)
Primary school	9 (13.4)	<b>Excessive malpractice anxiety</b>	39 (58.2)
Secondary school	4 (6)	<b>Exposure to violence</b>	17 (25.4)
High school	2 (3)	<b>Training need in medicolegal issues</b>	55 (82.1)
Older age	4 (6)		

rate was significantly higher in physicians working in emergency service ( $p = 0.024$ ). Violence exposure and the need for training on medicolegal subjects did not significantly differ for other demographic characteristics ( $p > 0.05$ ). The condition of having children/number of children was observed as the parameter that had the lowest degree of significance in medicolegal questions as well as questions on violence exposure (Table 2).

Cronbach  $\alpha$  value was 0.836 for the whole Maslach Burnout Inventory (MBI), and the answers given to this inventory were highly reliable. While the Cronbach  $\alpha$  coefficient was 0.875 for the Emotional Exhaustion sub-dimension, it was calculated as 0.756 for Depersonalization and as 0.722 for Personal Accomplishment (Table 3).

When the scores for MBI sub-dimensions were evaluated based on demographics, the Emotional Exhaustion score was observed significantly higher in females than males ( $p = 0.044$ ). A significant difference was not detected in MBI scores of physicians based on age group, marital status, or having children ( $p > 0.05$ , Table 4).

MBI sub-dimensions were compared according to the positions of the physicians. EE score was lower in subspecialist attending physicians compared to general attending physicians ( $p = 0.035$ ). On the other

**Table 2**  
Distribution of answers to medicolegal questions by demographic characteristics and duty status.

	Excessive malpractice anxiety			Exposure to violence			Training need in medicolegal issues		
	Present	None	p-value*	Present	None	p-value*	Present	None	p-value*
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
<b>Gender</b>			0.065			0.074			0.191
Male	11 (42.3)	15 (57.7)		3 (11.5)	23 (88.5)		19 (73.1)	7 (26.9)	
Female	28 (68.3)	13 (31.7)		14 (34.1)	27 (65.9)		36 (87.8)	5 (12.2)	
<b>Marital status</b>			0.065			0.527			0.048
Married	28 (68.3)	13 (31.7)		12 (29.3)	29 (70.7)		37 (90.2)	4 (9.8)	
Single	11 (42.3)	15 (57.7)		5 (19.2)	21 (80.8)		18 (69.2)	8 (30.8)	
<b>Child status</b>			1.000			0.950			1.000
None	22 (59.5)	15 (40.5)		10 (27)	27 (73)		30 (81.1)	7 (18.9)	
Present	17 (56.7)	13 (43.3)		7 (23.3)	23 (76.7)		25 (83.3)	5 (16.7)	
<b>Duty</b>			0.133			0.064			0.769
Resident physician	18 (56.2)	14 (43.8)		10 (31.2)	22 (68.8)		26 (81.2)	6 (18.8)	
General attending physician	16 (72.7)	6 (27.3)		7 (31.8)	15 (68.2)		19 (86.4)	3 (13.6)	
Subspecialist attending physician	5 (38.5)	8 (61.5)		0 (0)	13 (100)		10 (76.9)	3 (23.1)	
<b>Emergency Service</b>			0.337			0.024			0.673
Not attendant	31 (55.4)	25 (44.6)		11 (19.6)	45 (80.4)		45 (80.4)	11 (19.6)	
Attendant	8 (72.7)	3 (27.3)		6 (54.5)	5 (45.5)		10 (90.9)	1 (9.1)	
<b>Polyclinic</b>			0.953			0.695			0.195
Not attendant	25 (56.8)	19 (43.2)		10 (22.7)	34 (77.3)		34 (77.3)	10 (22.7)	
Attendant	14 (60.9)	9 (39.1)		7 (30.4)	16 (69.6)		21 (91.3)	2 (8.7)	
<b>Quarantine service</b>			0.391			0.595			1.000
Not attendant	4 (80.0)	1 (20.0)		2 (40.0)	3 (60.0)		4 (80)	1 (20)	
Attendant	35 (56.5)	27 (43.5)		15 (24.2)	47 (75.8)		51 (82.3)	11 (17.7)	
<b>Intensive care</b>			0.204			0.528			1.000
Not attendant	27 (52.9)	24 (47.1)		12 (23.5)	39 (76.5)		42 (82.4)	9 (17.6)	
Attendant	12 (75)	4 (25)		5 (31.2)	11 (68.8)		13 (81.2)	3 (18.8)	

\* The result of chi-square tests.

hand, the EE score was significantly higher in physicians worrying too much about malpractice ( $p < 0.001$ , Table 5). In physicians feeling the need for training in the medicolegal field, PA score was significantly higher ( $p < 0.001$ ). A statistically significant difference was not observed in MBI sub-dimensions, among other characteristics ( $p > 0.05$ ).

Based on the examination of MBI sub-dimension scores of physicians according to violence exposures, while EE score was significantly higher in physicians exposed to violence ( $p = 0.046$ ), DP and PA scores were at a similar level (Fig. 1).

#### 4. Discussion

Most of the scientific studies conducted since the beginning of the COVID-19 pandemic are on subjects such as diagnosis/treatment and the course management of the disease. However, another subject as crucial as the clinic of the disease is the condition of healthcare workers. The concerns of healthcare workers and their mental health should be closely followed-up. Already suffering about burnout in routine working conditions, healthcare professionals work with great sacrifice under extraordinary conditions in public health crises such as a pandemic. Thus, we planned to perform this study on internal medicine physicians taking an active role in many units in the pandemic.

When the physicians' demographics in this research were examined, 61.2% were female, and the mean age was 34.7%. Although the Republic of Turkey is a country between Europe and the Middle East, it has

**Table 3**  
Internal consistency levels of MBI and sub-dimensions.

	Number of questions	Cronbach $\alpha$ value
Emotional Exhaustion (EE)	9	0.875
Depersonalization (DP)	5	0.756
Personal Accomplishment (PA)	8	0.722
The sum of the sub-dimensions (Overall the inventory)	22	0.836

**Table 4**  
Evaluation of sub-dimension scores according to demography.

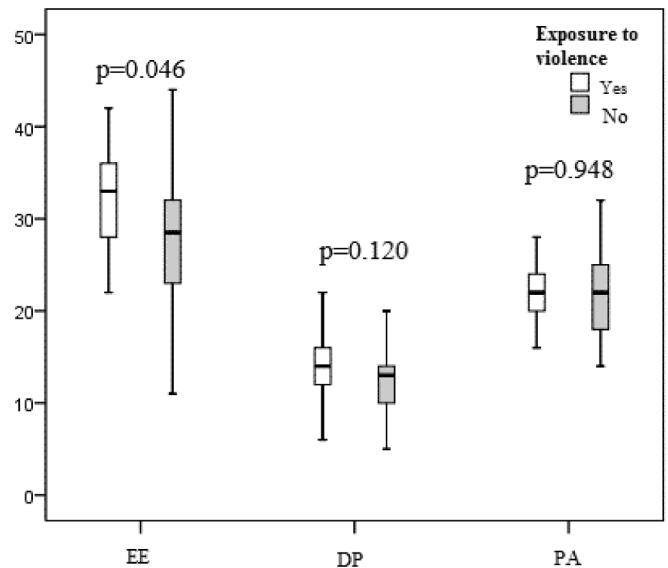
	Emotional Exhaustion	Depersonalization	Personal Accomplishment
	Med ± SD Median (min-max)	Median (min-max)	Med ± SD Median (min-max)
<b>Age</b>			
≤35	30 (14-39)	13 (5-18)	22 (14-31)
>35	29 (11-44)	13 (5-22)	23 (15-32)
<b>p-value</b>	0.615	0.979	0.555
<b>Gender</b>			
Male	27 (11-44)	13 (5-20)	22 (14-32)
Female	31 (11-42)	13 (5-22)	22 (16-31)
<b>p-value</b>	<b>0.044</b>	0.556	0.129
<b>Marital status</b>			
Married	30 (11-44)	13 (5-22)	23 (15-32)
Single	29 (14-38)	13 (5-20)	21 (14-31)
<b>p-value</b>	0.611	0.781	0.136
<b>Child status</b>			
None	29.4 ± 6.1	13 (5-20)	21.7 ± 4.4
Present	28.1 ± 8.0	13 (5-22)	22.8 ± 3.8
<b>p-value</b>	0.470*	0.810	0.271*

\*Independent t-test result.

**Table 5**  
Evaluation of sub-dimension scores concerning duty and medicolegal questions.

	Emotional Exhaustion	Depersonalization	Personal Accomplishment
	Median (min-max)	Median (min-max)	Median (min-max)
<b>Duty</b>			
Resident physician	30 (21-39)	14 (8-18)	22 (14-31)
General attending physician	31 (11-44) <sup>1</sup>	13 (5-22)	23 (15-32)
Subspecialist attending physician	27 (11-31) <sup>1</sup>	12 (5-16)	21 (16-29)
<b>p-value</b>	<b>0.033</b>	0.242	0.320
<b>Emergency Service</b>			
Not attendant	29 (11-44)	13 (5-22)	22 (14-32)
Attendant	33 (21-39)	16 (9-17)	21 (17-28)
<b>p-value</b>	0.373	0.122	0.622
<b>Polyclinic</b>			
Not attendant	29 (11-44)	14 (5-20)	22 (14-32)
Attendant	29 (11-42)	13 (5-22)	23 (16-30)
<b>p-value</b>	0.838	0.360	0.340
<b>Quarantine service</b>			
Not attendant	31 (11-42)	13 (5-22)	27 (19-30)
Attendant	29 (11-44)	13 (5-20)	22 (14-32)
<b>p-value</b>	0.618	0.737	0.176
<b>Intensive care</b>			
Not attendant	29 (11-44)	13 (5-22)	22 (15-32)
Attendant	30 (14-37)	13 (5-18)	21 (14-31)
<b>p-value</b>	0.924	0.762	0.521
<b>Additional stress</b>			
Present	32 (21-39)	14 (9-17)	23 (14-31)
None/ Present, not felt	28 (11-44)	13 (5-22)	22 (15-32)
<b>p-value</b>	0.079	0.298	0.969
<b>Excessive malpractice anxiety</b>			
Present	32 (21-44)	14 (6-22)	23 (15-31)
None	25 (11-40)	13 (5-18)	22 (14-32)
<b>p-value</b>	<b>&lt;0.001</b>	0.073	0.368
<b>Training need in medicolegal issues</b>			
Present	30 (11-42)	13 (5-22)	23 (16-32)
None	27 (11-44)	11 (5-18)	18 (14-30)
<b>p-value</b>	0.185	0.094	<b>&lt;0.001</b>

<sup>1</sup>Significant difference between the two groups (p = 0.035).



**Fig. 1.** Distribution of sub-dimension scores by exposure to violence.

a male-dominant society with eastern culture dominancy. We are pleased with the results that we found a higher population consisting of young and female physicians, which is not usual for our country. On the other hand, this study was conducted in İzmir, a city neighboring Europe via the Aegean coast, also known as a high intellectual level. As a result, we think that our findings may also light the way for similar future studies on the European population.

Almost half of the participants being resident doctors were evaluated as a positive result for homogeneous distribution. It was also concluded that 92.5% of the participants were working in inpatient services which are among the most critical units of the pandemic and 61.2% of them did not have any stressor in this period other than pandemic conditions. With these findings, we may conclude that the answers were mostly given by physicians who worked right in the centre of the pandemic and whose only stress factor was mostly COVID-19 pandemic.

Based on the distribution of answers given to medicolegal questions, the significance level was mostly higher than expected (p > 0.05) (Table 2). The reason for this condition is the lack of a uniform distribution in the subgroups (gender, marital status, number of children, and such) in this section. Considering the cross-sectional character of this study, it can be understood that the acquisition of a uniform distribution is extremely difficult. However, the results of many parameters were close to the significance level. For example, 28 out of 39 physicians (58.2%) worrying too much about malpractice in this period were female. Based on the MBI, the obtained EE score was notably significant, and the DP score was nearly significant in females (Table 4). When these results were evaluated altogether, the findings suggest that females' malpractice concerns and burnout conditions were interrelated. On the other hand, finding a considerably high rate of 42.3% for this concern in males shows that this concern is not specific for a gender. We detected this concern in married physicians as 68.3% which was a rate close to the significance level. This condition was interpreted as a physician with a family bond has the concern of avoiding medical malpractice due to the responsibility of the partner/parent role. In the subspecialty period embodying the progress of professionalism, this concern was observed to minimize with a rate of 38.5%. This finding was interpreted as the physicians' approach in this position are bound to their academic knowledge and self-confidence caused by their specific fields. Due to residents feeling themselves as physicians still taking education and not having primary responsibility, their malpractice concern (56.2%) was found lower than general attending physicians (72.7%).

In this study, the findings showed that 55 out of 67 physicians (82%)

felt inadequate on medicolegal subjects and needed training during the pandemic period. Married physicians gave the most significant answers to this question (90.2%), and then female physicians (87.8%). On the other hand, the need for training was at a higher rate compared to malpractice concern in all parameters. This condition was interpreted as the physicians' demand for updating their professional knowledge, although they do not feel inadequate.

Violence towards healthcare workers has not been prevented and this is still a crucial global problem. The latest European Working Conditions Surveys (EWCS) report published most recently in 2016 by Eurofound is the most comprehensive research on this subject and shares remarkable information [13]. According to this research, which includes 43,850 participants from 35 European countries, 36% of the individuals who provide healthcare were exposed to verbal violence, humiliating behavior, and tyranny, while 7% were exposed to physical violence. In addition, 5% were exposed to undesired sexual behavior or sexual harassment. The most significant ( $p = 0.024$ ) finding on this subject in our study was that the physicians not working in the emergency service did not state any exposure to violence (80.4%). The second most significant finding in this section was the higher exposure of women to violence (34.2%) than men (11.5%). Based on these, exposure to more violence can be considered a reason for higher EE and DP values in females. As the most significant third result, we see the differences in violence exposure based on the duty field. While none of the subspecialists stated any exposure to violence, residents and general attending physicians each reported a violence exposure of 31%. In addition to being in the elder age group, subspecialist physicians are more advanced with their professional experience and academic knowledge. Thus, professional management of the diagnosis & treatment or taking the precautions by feeling the violence was thought to be effective in this finding about the subspecialists.

Verbal and physical violence not only causes psychological harm to the individuals but also harms their social personalities in addition to the moral harm caused. In physicians exposed to violence, EE was found more significant ( $p = 0.046$ ) (Fig. 1). Given that physicians working in a busy schedule risking their own lives and experiencing burnout are often exposed to physical and verbal violence, even in the pandemic is thought-provoking.

This research's another satisfying finding was the high reliability of the internal consistency levels of the answers to the burnout inventory. In the evaluation based on demographics, the higher rate of EE in females was the most significant result ( $p = 0.044$ ) (Table 4). Considering other sub-dimensions, the most significant findings were obtained in the gender parameter again. One of the latest studies in this field in our country was conducted in 2018 on 310 physicians working in different fields [14]. In this study, while there was no significant difference between females and males concerning the PA sub-dimension, there were significantly high female scores in the DP and EE sub-dimensions. A study similar to ours was conducted on 1795 medical staff working actively in acute and critical care division in Taiwan during the COVID-19 period. In this study, workers had a higher incidence of anxiety, depressive disorder, and burnout, but no significant difference was noted between males and females [8]. While the notion that burnout is more significant in young physicians is prevalent in the literature [15], a correlation was not found between age and burnout sub-dimensions in our study.

In examining physicians' burnout related to the position and duty places, the position was the most significant value when considering emotional exhaustion ( $p = 0.033$ ) (Table 5). In addition to the EE sub-dimension found the lowest value in subspecialist attending physicians, the difference between general attending physicians and subspecialist attending physicians was also significant within itself. This finding was also evaluated in accordance with the lower burnout risk in physicians who are engaged in academic activities and who have professional seniority such as subspecialists. The second most significant result in this section was the high DP sub-dimension rate in physicians

working in emergency service compared to others. Apart from this, EE and DP parameters were more significant in physicians working in emergency service was also a finding consistent with the literature. A study evaluating 215 nurses working in the MERS-CoV pandemic was conducted in South Korea in 2015 [16]. This study showed that especially the nurses working in emergency service had extreme burnout. In addition to dealing with a comprehensive patient spectrum and highly traumatic incidents, being obliged to make crucial decisions in a short time was explained as the causes of this condition.

One of the most interesting findings of this study is getting significant results from two sub-dimensions in legal questions ( $p < 0.01$ ) (Table 5). These findings indicated how the anxiety levels of physicians on medicolegal subjects were related to EE and PA conditions. Besides, DP value was at the significance border in physicians who had malpractice concerns and felt the need for medicolegal training. This finding demonstrated how physicians prioritize their legal liabilities, regardless of how desensitized to their patients.

One of the study's limitations was conducting among physicians working in a single hospital. However, in the first phase of the pandemic, where physicians worked in chaotic and severe conditions, it would not be possible to efficiently complete a multi-centered and widely participated research by applying face-to-face. The hospital where this study was conducted was one of the largest pandemic hospitals in the country with approximately 1000 patient beds, taking care of local and transported patients from across the country. Besides, the physicians participating in this study were not from the same local socio-culture or scientific discipline. They were physicians from different subspecialties of scientific circles of the country. Therefore, comparative statistical analyses considering the large hospital capacity with the physicians belonging to different disciplines were remarkable compared with the literature. The results obtained from this study aim to shed light on more comprehensive studies in this field.

Another limitation was the lack of periodic comparison of the results since this study was not applied with the same content in the pre-pandemic. Unfortunately, a pandemic occurs suddenly and performing pre-controlled research is not possible. Specifically, we requested the participants to answer questions by considering the pandemic's first phase in which they worked under severe conditions. Also, we asked the participants if there were any additional stressors during this period. Thus, we aimed to obtain specific answers belong to the pandemic period with these points. As a result of the research, most physicians stated no additional stressors except for pandemic conditions. In addition, we performed comparative statistics between this parameter and burnout scale sub-dimensions; we found a result close to significance in the EE sub-dimension (Table 5).

## 5. Summary

This study showed that healthcare workers' well-being is as important as the pandemic and should be closely followed-up. Physicians working in broad fields, such as internal medicine, provide healthcare across many units during the COVID-19 pandemic. Thus, they were affected mentally within this period due to their responsibilities that arose from the content of their field. Internal medicine physicians did face legal concerns and violence besides the diagnosis and treatment stress during this period.

The obtained results suggest that health institution executives should play an active role in pandemics. The executives should closely follow up with their staff for burnout and deal individually with their concerns and problems. In such periods when severe working conditions are accompanied by personal problems, physicians should not feel inadequate in legal matters. In addition to this, the physicians should always feel the administration's support in case of legal problems. The training programs, which should also be organized in routine working periods, should be more specific and frequent in pandemics. It should be organized in frequent periods to relieve medical and legal concerns.

Otherwise, malpractices may occur due to physicians' defensive approach during treatment or their emotional instability in decision phases.

State authorities should increase their activities to raise the awareness of the society in pandemics. For instance, eliminating the violence concern of healthcare workers alone may significantly decrease their anxiety levels. Authorities should increase the precautions for violence against healthcare workers in such periods. Problems such as the supply of medical protective equipment should also be resolved. While working in the hospital, the physicians should not have any concerns about their families' care or any financial issues; therefore, authorities should solve problems like these. Otherwise, malpractices may occur as the physician may refer to defensive medicine with legal concerns or with the effects of burnout. Besides, disruption of the peaceful environment or problems in providing healthcare may be seen among professionals working with burnout.

As a result, healthcare workers' motivations will increase if they feel valued, their working conditions have been improved, and if they are in mentally well. This mental wellness may contribute to fighting public health crises such as a pandemic more efficiently with the lowest number of casualties.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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### References

- [1] H.J. Freudenberger, Staff burn-out, *J. Social Issues* 30 (1) (1974) 159–165.

- [2] C. Maslach, S.E. Jackson, M.P. Leiter, W.B. Schaufeli, R.L. Schwab, *Maslach burnout inventory*, Consulting Psychologists Press, Palo Alto, CA, 1986.
- [3] C. Maslach, S.E. Jackson, The measurement of experienced burnout, *J. Organiz. Behav.* 2 (2) (1981) 99–113, <https://doi.org/10.1002/job.4030020205>.
- [4] Y.-W. Lin, The causes, consequences, and mediating effects of job burnout among hospital employees in Taiwan, *J. Hospital Administration* 2 (1) (2012) 15.
- [5] B.M. Jennings, Work stress and burnout among nurses: Role of the work environment and working conditions. *Patient Safety and Quality: An Evidence-based Handbook for Nurses*, Agency for Healthcare Research and Quality (US), 2008.
- [6] W.H. Organization, WHO Director-General's opening remarks at the media briefing on COVID-19 - March 11, 2020 [Available from <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>].
- [7] H. Blake, F. Bermingham, G. Johnson, A. Tabner, Mitigating the psychological impact of COVID-19 on healthcare workers: a digital learning package, *Int. J. Environ. Res. Public Health* 17 (9) (2020) 2997.
- [8] C.-W. Sung, C.-H. Chen, C.-Y. Fan, F.-Y. Su, J.-H. Chang, C.-C. Hung, et al., Burnout in medical staffs during a Coronavirus disease (COVID-19) pandemic, 2020. Available at SSRN 3594567.
- [9] M.C.T. Dimitriu, A. Pantea-Stoian, A.C. Smaranda, A.A. Nica, A.C. Carap, V. D. Constantin, A.M. Davitoiu, C. Cirstoveanu, N. Bacalbasa, O.G. Bratu, F. Jacota-Alexe, C.D. Badiu, C.G. Smarandache, B. Socea, Burnout syndrome in Romanian medical residents in time of the COVID-19 pandemic, *Medical Hypotheses* 144 (2020) 109972, <https://doi.org/10.1016/j.mehy.2020.109972>.
- [10] A.M. Khalafallah, S. Lam, A. Gami, D.L. Dornbos III, W. Sivakumar, J.N. Johnson, D. Mukherjee, Burnout and career satisfaction among attending neurosurgeons during the COVID-19 pandemic, *Clin. Neurol. Neurosurg.* 198 (2020) 106193, <https://doi.org/10.1016/j.clineuro.2020.106193>.
- [11] P. Bansal, T.A. Bingemann, M. Greenhawt, G. Mosnaim, A. Nanda, J. Oppenheimer, H. Sharma, D. Stukus, M. Shaker, Clinician wellness during the COVID-19 pandemic: extraordinary times and unusual challenges for the allergist/immunologist, *J. Allergy Clin. Immunol. Pract.* 8 (6) (2020) 1781–1790.e3, <https://doi.org/10.1016/j.jaip.2020.04.001>.
- [12] C. Ergin, Burnout in Doctor and Nurses and Adaptation of Maslach Burnout Inventory, VII National Psychology Congress, Ankara, 1992.
- [13] A. Parent-Thirion, I. Biletta, J. Cabrita, O. Vargas, G. Vermeylen, A. Wilczynska, et al., Sixth European working conditions survey: overview report: Eurofound (European Foundation for the Improvement of Living and Working Conditions, 2016).
- [14] T.Y. Hacer, A. Ali, Burnout in physicians who are exposed to workplace violence, *J. Forensic Legal Med.* 69 (2020) 101874, <https://doi.org/10.1016/j.jflm.2019.101874>.
- [15] R. Galaiya, J. Kinross, T. Arulampalam, Factors associated with burnout syndrome in surgeons: a systematic review, *Ann. Royal College Surg. England* (2020) 1–8.
- [16] J.S. Kim, J.S. Choi, Factors influencing emergency nurses' burnout during an outbreak of middle east respiratory syndrome Coronavirus in Korea, *Asian Nurs. Res.* 10 (4) (2016) 295–299, <https://doi.org/10.1016/j.anr.2016.10.002>.