

# Burnout, Job Satisfaction, and Psychological Symptoms Among Emergency Physicians During COVID-19 Outbreak: A Cross-Sectional Study

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## ABSTRACT

**Objective:** The current research during COVID-19 has not yet addressed burnout, job satisfaction (JS), and psychological outcomes among emergency physicians (EPs). The aims of this study are to investigate the burnout, JS, depression, anxiety, and stress levels of EPs who struggle against COVID-19 and to analyze the associated influencing factors.

**Materials and Methods:** This study used a cross-sectional survey design with 331 EPs working in İstanbul, Turkey. The Maslach Burnout Inventory, which assesses emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA); the Minnesota Job Satisfaction Questionnaire; Depression-Anxiety-Stress Scales-21; and a structured questionnaire on sociodemographic- and work-related characteristics were used.

**Results:** The rates of high-level EE, DP, and reduced PA were 71.3%, 55.3%, and 47.4%, respectively. From mild to extremely severe, depression, anxiety, and stress symptoms were 89.1%, 70.2%, and 60.1%, respectively, at any level. Overall JS was mostly moderate with 74.9%. High depression level, low JS level, and low work experience were found to be the variables that most accurately predicted burnout. Individuals being diagnosed with COVID-19, being quarantined, and having psychiatric disorder histories carry the risk of worse mental health. Residents and general practitioners have higher levels of EE, depression, and anxiety with low JS than specialists.

**Conclusion:** This study reveals a high risk of burnout, depression, anxiety, stress, and also insufficient JS in EPs during the pandemic. From the results of our study, it is recommended that investigations are carried out and evidence-based interventions are developed to improve mental well-being, increase JS, and prevent burnout.

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## INTRODUCTION

Coronavirus Disease 2019 (COVID-19) was detected for the first time in December 2019 in Wuhan, China, as a novel pneumonia causing respiratory tract infection.<sup>1</sup> Indicative of person-to-person transmission and asymptomatic transportation, COVID-19 rapidly spread all over the world.<sup>2</sup> Insufficient psychological preparation, overwhelming workload, and uncertain features of COVID-19 caused the development of various psychological problems, such as anxiety disorders, depression, avoidance behavior, insomnia, and burnout syndrome among healthcare workers (HCWs) in the pandemic process.<sup>3,4</sup> Crowded work environments, variability of the severities of the cases, and the need for accelerated and effective decision making constitute the difficulties that emergency physicians (EPs) encounter. In addition to the difficulties mentioned earlier, considering the

circumstances of being exposed to the virus, the risk of infecting relatives, remaining incapable of caregiving to their children, and being isolated from family, it is evident that the EPs are exposed to serious psychological pressures during the pandemic period.<sup>4,5</sup>

In previous studies, it was reported that burnout incidences among EPs were between 25% and 77.8%.<sup>6</sup> The burnout concept is defined as a physical, emotional, and mental situation in which loss of idealism and aimlessness are experienced with feelings of unsuccess, hopelessness, and desperation in stressful work environments.<sup>7</sup> The uncertainty of the disease, the possibility of prolongation of the pandemic, excessive wearing out, and feelings of exhaustion due to psychological problems lead to (i) emotional exhaustion (EE), which is the beginning and basis of burnout syndrome; (ii) depersonalization

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(DP), which includes negative, non-serious attitudes and feelings toward the people they serve, regardless of their individuality; and (iii) reduced personal accomplishment (RPA), which is defined as a feeling of inadequacy and unsuccess. In addition to burnout and psychological problems, together with the subsidence of job satisfaction (JS) in the long term, the possibility of problems such as ceasing employment, decrease in performance, and arguments with colleagues and executives will increase.<sup>7-10</sup>

To the best of our knowledge, although there are studies in the literature on the mental health of HCWs during the COVID-19 period till date,<sup>3</sup> there is no study focusing on EPs. In this paper, our aim is to define burnout, JS, depression, anxiety, and stress levels of EPs during the pandemic; to determine the predictors of burnout subscales, depression, anxiety, stress, and JS; and also to identify stressful events that were experienced during the pandemic and their effects on EPs. In this way, we aimed to shed light on the measures to be taken to prevent burnout and reduce mental problems of EPs.

## MATERIALS AND METHODS

### Study Design, Selection of Participants

The study was conducted between July 1, 2020, and July 20, 2020, among physicians working at the emergency departments (EDs) of state and university hospitals affiliated to the Ministry of Health in Istanbul. The research was approved by the Ethics Committee of the University of Health Sciences (Ref: 2020.06.22-37) and was conducted in accordance with the Helsinki Declaration. While the study was being performed, the number of physicians working in EDs within the borders of Istanbul was 2063, and they were all invited to participate in the study via e-mail. The sample size was determined using a web calculator (<https://www.surveymonkey.com/mp/sample-size-calculator/>), and it was found that 324 participants with a 95% CI and a 5% margin of error would be ideal for the study. After obtaining online written informed consent, participants were invited to answer a self-reported online battery of questionnaires made available through the Survey Monkey platform (<https://tr.surveymonkey.com/>). The battery of questionnaires was composed of 4 sections. The sections were as follows.

### Outcome Measures

The Personal Information Form included 22 items prepared by the authors in accordance with the purpose of the study. On the basis of these items, sociodemographic features such as age, gender, marital status, etc.; and job information such as working experience, weekly working hours, professional groups [General practitioners (GPs; medical doctors working in the EDs, not being trained to

**Table 1.** Sociodemographic and Work-Related Characteristics, N= 331

Variable	n (%)	[95% CI]
Sex		
Female	142 (42.9)	[37.5-48.3]
Male	189 (57.1)	[51.7-62.5]
Marital status		
Married	129 (39.0)	[33.5-44.4]
Unmarried	202 (61.0)	[55.6-66.5]
Job		
Specialist	95 (28.7)	[23.3-33.5]
Residency	153 (46.2)	[40.8-51.7]
Practitioner	83 (25.1)	[20.8-29.9]
Monthly Income		
5-9 thousand TL	209 (63.1)	[58.0-68.6]
10-15 thousand TL	69 (20.8)	[16.6-25.4]
16 thousand TL and above	53 (16.0)	[12.1-19.9]
History of psychiatric disorders		
No	266 (80.4)	[76.1-84.6]
Yes	65 (19.6)	[15.4-23.9]
Additional chronic disease		
No	283 (85.5)	[81.6-89.1]
Yes	48 (14.5)	[10.9-18.4]
Satisfaction with EM career		
No	102 (30.8)	[25.7-35.6]
Yes	229 (69.2)	[64.4-74.3]
24-h shifts		
No	48 (14.5)	[10.9-18.4]
Yes	283 (85.5)	[81.6-89.1]
	Median (IQR)	
Age (Years)	29 (27-35)	[29-30]
Work experience in EM (Years)	5 (2-10)	[4-5]
Weekly working hours during COVID-19 outbreak	50 (45-55)	[50-50]

IQR: interquartile range 25%, 75%.

be specialists), residents (assistant doctors and doctors in training towards becoming specialists), and specialists (also known as consultants)] of participants were determined (Table 1). Together with these, information on stressful events experienced during the COVID-19 period and their effects on EPs were obtained.

The Maslach Burnout Inventory (MBI) evaluates the burnout syndrome in 3 dimensions: EE (9 questions), DP (5 questions), and personal accomplishment (PA) (8 questions) on a total of 22 questions. The Turkish adaptation of the scale was

performed on HCWs and the original 7-point Likert scale was changed to 5-point Likert scale. In the scale, “never (0)” to “always (4)” was used as a 5-point rating. It is known that high levels of EE and DP and a low level of PA indicate burnout. In our study, based on the relevant literature, the burnout scores were expressed as low, moderate, and high (EE: low, 0-11; moderate, 12-17; and high,  $\geq 18$ ; DP: low, 0-5; moderate, 6-9; and high,  $\geq 10$ ; and PA: low,  $\geq 26$ ; moderate, 22-25; and high, 0-21).<sup>11,12</sup> The Cronbach’s alpha of the MBI was calculated in this study and found to be as follows: EE=0.86; DP=0.72; PA=0.77.

The Minnesota Job Satisfaction Questionnaire (MSQ) evaluates JS over a total of 20 questions.<sup>13</sup> The scale is a 5-point Likert scale, ranging from “not at all satisfactory (1)” to “very satisfactory (5)”. The Turkish adaptation of the scale was made by Baycan (1985).<sup>14</sup> The lowest score that can be obtained from this scale is 20 and the highest score is 100. In our study, 25 and below means low JS, 26-74 means average JS, and 75 and above means high JS according to general satisfaction score values. In this study, Cronbach’s alpha of the MSQ was 0.89.

The Depression Anxiety Stress Scales-21 (DASS-21) is a 21-item, self-reporting questionnaire designed to measure the severity of depression (7 items), anxiety (7 items), and stress (7 items). It is a 4-point Likert scale ranging from “never (0)” to “almost always (3)” and evaluates symptoms from last week. DASS-21 evidenced excellent validity and test-retest reliability ( $r=0.99$ ) among clinical and general population samples. DASS-21 raw scores were doubled for comparability to full-length (42 items) DASS scores. The depression score results were classified as normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and extremely severe (28-42). The anxiety score results were classified as normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and extremely severe (20-42). The stress score results were classified as normal (0-10), mild (11-18), moderate (19-26), severe (27-34), and extremely severe (35-42).<sup>15,16</sup> Among the current sample, the DASS-21 subscales evidenced a Cronbach’s alpha of  $\alpha=0.81$  for depression,  $\alpha=0.77$  for anxiety and  $\alpha=0.82$  for stress.

### Statistical Analysis

The descriptive statistics were presented in median values and interquartile ranges (IQR; 25% to 75%) for the quantitative variables, and frequencies and percentages for the categorical variables. The normality of distribution for continuous variables was tested using the Kolmogorov-Smirnov test. The Kruskal-Wallis 1-way analysis of variance was used to evaluate possible differences of not normally distributed variables (EE, DP, RPA, JS, depression, anxiety, and stress;  $P < .05$ ) between the professional groups (GPs, residents, and specialists), and the level of significance was determined after the Dunn’s multiple comparison tests with Bonferroni’s correction test. The median and proportional

differences between groups are presented with Cohen’s *d* and 95% CIs. Multiple linear regression models were used with a backward elimination technique to investigate potentially predictive factors for the development of EE, DP, RPA, JS, depression, anxiety, and stress. The variables evaluated were determined as significant variables derived from our results and a literature review, in accordance with clinical experience. The common variables used for all the models are as follows: sex, age, marital status, monthly income, history of psychiatric disorders, satisfaction with EM career, 24-h shifts, work experience in EM (years), weekly working hours during COVID-19 outbreak, experiencing COVID-19 symptoms, being quarantined, being diagnosed with COVID-19, feeling safe while working, the chief taking opinions into account, the ED being properly arranged for the pandemic, and reorganized working hours for COVID-19 outbreak. Additionally, anxiety, depression, and stress scores were added for the EE, DP, and RPA models. The assumptions of homoscedasticity of residuals were checked with residual plots and quantile-quantile plots. All tolerance values were between 0.55 and 0.89, and all bivariate correlations between variables included in the model were  $\leq 0.70$ , indicating that multicollinearity was not an issue. All the analyses were 2-sided with alpha of 0.05 and performed with SPSS statistical software (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.).

## RESULTS

Among the 2063 EM physicians, 629 opened the e-mail advertising for the survey and 365 (58.02%) responded. Of these, 331 (52.62%) physicians who completed answers for all surveys and worked with COVID-19 patients were included in the study.

### Sociodemographic and Work-Related Characteristics

Sociodemographic and work-related characteristics of the participants are shown in Table 1. The median age was 29 years (IQR=27-35 years), median work experience in EM was 5 years (IQR=2-10 years), and median weekly working hours during the COVID-19 outbreak was 50 h (IQR=45-55 h). In this study, 65 (19.6%) of the 331 participants had history of psychiatric disorder. As for the 331 participants, 95 (28.7%) were specialists, 153 (46.2%) were residents, and 83 (25.1%) were GPs.

### Experience of EPs During COVID-19 and its Influences on Them

During the pandemic, 276 (83.4%) of the participants have experienced symptoms similar to COVID-19, 301 (90.9%) of them had taken the PCR test, 69 (20.8%) were quarantined and 54 (16.3%) were diagnosed with COVID-19. In this study, 219 (66.2%) of them stated that the EDs were properly arranged for the pandemic, and 212 (64.0%)

stated that the working hours were reorganized for the COVID-19 outbreak. Only 29 (8.8%) of the participants stated that they felt completely safe while working. On the one hand, 216 (65.2%) of them expressed that COVID-19 outbreak has increased their JS; on the other hand, 119 (36%) of them remarked that COVID-19 outbreak has decreased their willingness to work (Table 2).

### Burnout, JS, and Anxiety-Depression-Stress Levels

Among the EPs, high levels of EE, DP, and RPA were 71.3% (95% CI=65.9-76.1%), 55.3% (95% CI=49.6-60.4%), and 47.4% (95% CI=42.0-53.2%), respectively. The overall JS was mostly moderate with a ratio of 74.9% (95% CI=70.7-79.8%). Depression, anxiety, and stress symptoms were 89.1% (95% CI=85.8-92.4%), 70.1% (95% CI=65.3-75.2%), and 60.1% (95% CI=54.7-65.6%), respectively, from mild to extremely severe at any level (Table 3).

### Differences and Comparisons of Burnout, JS, and Anxiety-Depression-Stress Levels in Professional Groups

The Kruskal-Wallis test revealed statistically significant differences among professional groups in terms of EE, DP, depression, anxiety, and JS scores (Table 4).

The subscales of MBI: EE [ $H(2)=22.20, P < .001$ ] and DP [ $H(2)=9.37, P=.009$ ] were significantly different between profession groups, but there was no difference in PA [ $H(2)=5.24, P=.073$ ]. While the EE levels of the residents and GPs were significantly higher than the specialists (the median difference between the 2 groups [95% CI]; 4 [1.5 to 6], 3 [1.5 to 7]), there was no difference among them.

There were significant differences on JS scores between the professional groups [ $H(2)=41.18, P < .001$ ]. The JS levels of residents and GPs were found to be significantly lower than specialists (the median difference between the 2 groups [95% CI]; 9 [-14 to -1.5], 14 [-17 to -7], respectively), and the JS levels of GPs were significantly lower than residents (the median difference between the 2 groups [% 95 CI], 5 [0 to 8.5]).

The subscales of DASS-21: Depression [ $H(2)=28.07, P < .001$ ] and anxiety [ $H(2)=8.61, P=.013$ ] were significantly different between the professional groups, but there was no differences in stress [ $H(2)=1.88, P=.389$ ]. Both the depression (the median difference between the 2 groups [95% CI]; 6 [2 to 8], 4 [0 to 8], respectively) and anxiety (the median difference between the 2 groups [95% CI]; 2 [0 to 6], 2 [0 to 6], respectively) levels of the residents and GPs were significantly higher than the specialists, but there was no difference among them.

### Predictors of EE, DP, and PA

Multiple linear regressions were carried out for predicting EE, DP, and PA (Table 5). High depression and stress levels, low JS, experiencing COVID-19 symptoms, dissatisfaction with EM career, 24-h shifts, and low work experience in EM (years) predicted high EE levels ( $N=331, R^2=0.460, F(8,$

**Table 2.** The Experiences of Emergency Physicians During COVID-19 and Influences of Them,  $N=331$

Variable	<i>n</i> (%)	[95% CI]
Having adequate PPE		
No	16 (4.8)	[2.7-6.9]
Yes	315 (95.2)	[93.1-97.3]
Experiencing COVID-19 symptoms		
No	55 (16.6)	[12.7-20.9]
Yes	276 (83.4)	[79.1-87.3]
Being quarantined		
No	262 (79.2)	[74.5-83.3]
Yes	69 (20.8)	[16.7-25.5]
Being tested for COVID-19		
No	30 (9.1)	[6.1-12.4]
Yes	301 (90.9)	[87.6-93.9]
Being diagnosed with COVID-19		
No	277 (83.7)	[79.7-87.3]
Yes	54 (16.3)	[12.7-20.3]
Feeling safe while working		
No	107 (32.3)	[27.0-37.9]
Partially	195 (58.9)	[53.0-64.5]
Yes	29 (8.8)	[5.8-11.8]
The chief taking opinions into account		
No	169 (51.1)	[45.8-56.4]
Yes	162 (48.9)	[43.6-54.2]
The emergency department being properly arranged for the pandemic		
No	112 (33.8)	[28.8-39.4]
Yes	219 (66.2)	[60.6-71.2]
Reorganized working hours for COVID-19 outbreak		
No	119 (36.0)	[30.6-41.5]
Yes	212 (64.0)	[58.5-69.4]
The influence of the pandemic on job satisfaction		
Decreased	41 (12.4)	[9.1-16.4]
Not Changed	74 (22.4)	[17.9-27.3]
Increased	216 (65.2)	[59.4-70.6]
The influence of the pandemic on willingness to work		
Negative	119 (36.0)	[30.9-41.2]
Not affected	100 (30.2)	[24.8-34.8]
Positive	112 (33.8)	[28.8-39.1]

PPE: personal protective equipment.

322)=34.32,  $P < .001$ ). The high depression level, low JS level, low monthly income, low work experience in EM (years), and 24-h shifts predicted high DP levels ( $N=331, R^2=0.296, F(6, 324)=22.71, P < .001$ ). The low JS level predicted RPA ( $N=331, R^2=0.163, F(2, 328)=31.92, P < .001$ ).

**Table 3.** MBI Subscales (EE, DP, and PA), DASS-21 Subscales (Depression, Anxiety, and Stress), and JS of the Participants as Median, Interquartile Ranges, Frequencies, Percentages and 95 % CI, *N*=331

Scales		[95% CI]
<b>MBI</b>		
EE, median (IQR)	21 (17-26)	[20-22]
Low (0-11), <i>n</i> (%)	23 (6.9)	[4.2-10.0]
Moderate (12-17), <i>n</i> (%)	72 (21.8)	[17.5-26.3]
High ( $\geq 18$ )*, <i>n</i> (%)	236 (71.3)	[65.9-76.1]
DP, median (IQR)	10 (7-12)	[9-10]
Low (0-5), <i>n</i> (%)	37 (11.2)	[7.6-14.8]
Moderate (6-9), <i>n</i> (%)	111 (33.5)	[29.0-38.7]
High ( $\geq 10$ )*, <i>n</i> (%)	183 (55.3)	[49.6-60.4]
PA, median (IQR)	22 (18-25)	[21-23]
RPA-low ( $\geq 26$ ), <i>n</i> (%)	81 (24.5)	[19.6-29.0]
RPA-moderate (22-25), <i>n</i> (%)	93 (28.1)	[23.6-32.9]
RPA-high (0-21)*, <i>n</i> (%)	157 (47.4)	[42.0-53.2]
DASS-21-total, median (IQR)	42 (30-52)	[40-44]
Depression, median (IQR)	20 (14-24)	[18-20]
Normal ((0-9)), <i>n</i> (%)	36 (10.9)	[7.9-14.5]
Mild (10-12), <i>n</i> (%)	35 (10.6)	[7.3-13.6]
Moderate (13-20), <i>n</i> (%)	118 (35.6)	[30.8-41.1]
Severe (21-27), <i>n</i> (%)	95 (28.7)	[23.6-33.5]
Extremely severe (28-42), <i>n</i> (%)	47 (14.2)	[10.6-18.1]
Mild to extremely severe, <i>n</i> (%)	295 (89.1)	[85.8-92.4]
Anxiety, median (IQR)	10 (6-14)	[10-10]
Normal (0-6), <i>n</i> (%)	99 (29.8)	[25.4-34.4]
Mild (7-9), <i>n</i> (%)	46 (13.9)	[10.3-17.8]
Moderate (10-14), <i>n</i> (%)	114 (34.4)	[29.6-39.6]
Severe (15-19), <i>n</i> (%)	40 (12.1)	[8.8-15.7]
Extremely severe (20-42), <i>n</i> (%)	32 (9.7)	[6.6-13.0]
Mild to extremely severe, <i>n</i> (%)	232 (70.1)	[65.3-75.2]
Stress, median (IQR)	12 (8-18)	[12-14]
Normal (0-10), <i>n</i> (%)	132 (39.9)	[34.7-45.0]
Mild (11-18), <i>n</i> (%)	127 (38.4)	[33.8-43.5]
Moderate (19-26), <i>n</i> (%)	59 (17.8)	[13.6-21.8]
Severe (27-34), <i>n</i> (%)	10 (3.0)	[1.2-4.8]
Extremely severe (35-42), <i>n</i> (%)	3 (0.9)	[0.0-2.1]
Mild to extremely severe, <i>n</i> (%)	199 (60.1)	[54.7-65.6]
<b>MSQ</b>		
Job satisfaction, median (IQR)	65 (59-75)	[63-67]
Low (20-25), <i>n</i> (%)	0 (0)	[0-0]
Moderate (26-74), <i>n</i> (%)	248 (74.9)	[70.7-79.8]
High ( $\geq 75$ ), <i>n</i> (%)	83 (25.1)	[20.2-29.3]

\*At high risk for burnout according to MBI definitions; IQR: Interquartile range 25%, 75%; MBI: Maslach Burnout Inventory; EE: Emotional Exhaustion; DP: Depersonalization; PA: Personal Accomplishment; RPA: Reduced personal Accomplishment; DASS-21: Depression, Anxiety and Stress Scale-21 Items; JS: Job Satisfaction; MSQ: Minnesota Satisfaction Questionnaire.

### Predictors of Depression, Anxiety, and Stress

Second multiple linear regressions were carried out for predicting depression, anxiety, and stress (Table 6). Not feeling safe while working, 24-h shifts, being diagnosed with COVID-19, dissatisfaction with EM career, and low monthly income predicted high depression levels ( $N=331$ ,  $R^2=0.230$ ,  $F(5, 325)=19.40$ ,  $P < .001$ ). Being quarantined, history of psychiatric disorders, and low monthly income predicted high anxiety levels ( $N=331$ ,  $R^2=0.140$ ,  $F(3, 327)=17.71$ ,  $P < .001$ ). History of psychiatric disorders, being quarantined, and not reorganized working hours for COVID-19 outbreak predicted high stress levels ( $N=331$ ,  $R^2=0.115$ ,  $F(3, 327)=14.11$ ,  $P < .001$ ).

### DISCUSSION

In this study, we aimed to determine burnout, JS, depression, anxiety, and stress levels of EPs during the outbreak; identify their predictors; evaluate their differences between profession groups; and define the effects of stressful events on EPs.

Our results show that high-level EE, DP, and RPA among the EPs were 71.3%, 55.3%, and 47.4%, respectively. Studies conducted before the pandemic have similarly shown significant burnout risk among EPs.<sup>6,8</sup> In a recently published meta-analysis made before the pandemic, including research using MBI as the scale similar to our study, high levels of EE, DP, and RPA were 40%, 41%, and 35%, respectively.<sup>9</sup> In the studies conducted during the COVID-19 outbreak, high-level EE, DP, and RPA among HCWs in Italy were 31.9%, 12.1%, and 34.3%, respectively<sup>10</sup>; another study among frontline nurses in Wuhan, China, reported values of 41.5%, 27.6%, and 38.3%, respectively.<sup>17</sup> Our findings have shown that the pandemic itself or changes as a result of the pandemic lead to an increased rate of burnout among EPs, and EPs experienced a higher rate of burnout than other HCWs as before the pandemic.<sup>6-10,17</sup>

In this study, high depression and stress levels, low JS, experiencing COVID-19 symptoms, dissatisfaction with a career in EM, 24-h shifts and low work experience predicted high EE levels. High depression level, low JS level, low monthly income, low work experience, 24-h shifts for DP, and low JS levels for RPA were detected as predictors. The correlation of many of these variables with burnout were shown in studies conducted before and during the pandemic.<sup>6,8,18-21</sup> The relationship between experiencing COVID-19 symptoms and burnout can be considered as a new finding for the literature. This relationship can be explained as the symptoms experienced cause psychological distress and EE in the ongoing process. When the literature findings and the data of this study are interpreted, the correlation between the high depression level, low JS level, and low work experience with burnout come into prominence. In this study, JS was mostly moderate with

**Table 4.** The Results of Kruskal-Wallis Tests for Comparing Scores MBI Subscales (EE, DP, and PA), DASS-21 Subscales (Depression, Anxiety, and Stress) and JS Between Profession Groups (Specialists, Residents, and GPs)

N = 331 Variable	Groups			H*	P-value	d**	Differences Between Groups (95% CI) <sup>†</sup>			
	Specialists, n = 95	Residents, n = 153	GPs, n = 83				Residents vs Specialists	GPs vs Specialists	Residents vs GPs	
	Median (IQR)	Median (IQR)	Median (IQR)							
EE	19 (14-23) <sub>a</sub>	23 (18-26) <sub>b</sub>	22 (18-28) <sub>b</sub>	22.20	<.001	0.51	4 [1.5 to 6]	3 [1.5 to 7]	1 [-3 to 2]	Residents = GPs > Specialists
DP	8 (7-11) <sub>a</sub>	10 (8-12) <sub>b</sub>	10 (7-12) <sub>ab</sub>	9.37	.009	0.30	2 [0 to 3]	2 [-1 to 3]	0 [-1 to 2]	Residents > Specialists; Residents = GPs; Specialists = GPs
PA	23 (18-27)	21 (18-25)	21 (16-25)	5.24	.073	0.20	2 [-5 to 0.5]	2 [-6 to 1]	0 [-3 to 3.5]	Specialists = Residents = GPs
JS	74 (63-79) <sub>a</sub>	65 (59-73) <sub>b</sub>	60 (54-66) <sub>c</sub>	41.18	<.001	0.73	9 [-14 to -1.5]	14 [-17 to -7]	5 [0 to 8.5]	Specialists > Residents > GPs
Depression	16 (10-20) <sub>a</sub>	22 (16-26) <sub>b</sub>	20 (14-26) <sub>b</sub>	28.07	<.001	0.58	6 [2 to 8]	4 [0 to 8]	2 [-2 to 4]	Residents = GPs > Specialists
Anxiety	8 (4-12) <sub>a</sub>	10 (6-14) <sub>b</sub>	10 (8-14) <sub>b</sub>	8.61	.013	0.28	2 [0 to 6]	2 [0 to 6]	0 [-2 to 2]	Residents = GPs > Specialists
Stress	12 (6-18)	12 (8-18)	14 (6-18)	1.88	.389	0.03	0 [-2 to 6]	2 [-2 to 8]	2 [-4 to 2]	Specialists = Residents = GPs

\*: Kruskal Wallis test; \*\*: Cohen's d; IQR: Interquartile range 25%, 75%; EE: Emotional Exhaustion; DP: Depersonalization; PA: Personal Accomplishment; JS: Job Satisfaction. †: Values are presented as median differences with 95% CI.

Note. Median with different subscripts differ at the  $P = .05$  level by Dunn multiple comparison tests with Bonferroni correction test.

**Table 5.** Linear Regression Analyses for the Predictors of Emotional Exhaustion, Depersonalization, and Personal Accomplishment

Variables	B (SE)	$\beta$	95% CI	P Value
<b>Emotional exhaustion<sup>1</sup></b>				
Depression	0.36 (0.04)	0.40	[0.26, 0.45]	<.001
Stress	0.08 (0.04)	0.09	[0.00, -0.17]	.045
Job satisfaction	-0.07 (0.02)	-0.12	[-0.12, -0.01]	.013
Experiencing COVID-19 symptoms <sup>a</sup>	1.67 (0.81)	0.09	[0.08, 3.27]	.039
Marital status <sup>b</sup>	1.24 (0.67)	0.08	[-0.09, 2.58]	.068
Satisfaction with EM career <sup>a</sup>	-2.06 (0.66)	-0.14	[-3.38, -0.74]	.002
24-h shifts <sup>a</sup>	2.23 (0.85)	0.11	[0.54, 3.92]	.010
Work experience in EM (years)	-0.16 (0.05)	-0.16	[-0.27, -0.05]	.003
<b>Depersonalization<sup>2</sup></b>				
Depression	0.17 (0.02)	0.40	[0.13, 0.22]	<.001
Job satisfaction	-0.03 (0.01)	-0.12	[-0.06, 0.00]	.028
24-h shifts	1.48 (0.46)	0.15	[0.56, 2.40]	.002
Work experience in EM (years)	-0.09 (0.03)	-0.17	[-0.15, -0.02]	.006
Monthly income <sup>c</sup>	0.60 (0.26)	0.13	[0.07, 1.13]	.025
Weekly working hours during COVID-19 outbreak	-0.04 (0.02)	-0.09	[-0.08, -0.00]	.055
<b>Personal accomplishment<sup>3</sup></b>				
Job satisfaction	0.17 (0.02)	0.41	[0.13, 0.22]	<.001
Weekly working hours during COVID-19 outbreak	0.06 (0.03)	0.10	[0.00, 0.13]	.051

B: unstandardized coefficients; SE: standard error of the estimate;  $\beta$ : adjusted coefficients; <sup>a</sup>(0: No(ref.)), 1: yes); <sup>b</sup>(0: unmarried (ref.)), 1: married); <sup>c</sup>Range 1-3 scale higher score means higher income.

<sup>1</sup>N=331, R<sup>2</sup>=0.460, F(8, 322)=34.32, P < .001.

<sup>2</sup>N=331, R<sup>2</sup>=0.296, F(6, 324)=22.71, P < .001.

<sup>3</sup>N=331, R<sup>2</sup>=0.163, F(2, 328)=31.92, P < .001.

**Table 6.** Linear Regression Analyses for the Predictors of Depression, Anxiety and Stress

Variables	B (SE)	$\beta$	95% CI	P
<b>Depression<sup>1</sup></b>				
24-h shifts <sup>a</sup>	3.01 (1.09)	0.13	[0.85, 5.17]	.006
Feeling safe <sup>b</sup>	-1.96 (0.69)	-0.15	[-3.32, -0.60]	.005
COVID-19 diagnosis <sup>a</sup>	4.50 (1.04)	0.21	[2.45, 6.54]	<.001
Monthly income <sup>c</sup>	-2.36 (0.53)	-0.23	[-3.41, -1.32]	<.001
Satisfaction with EM career <sup>a</sup>	-2.88 (0.85)	-0.17	[-4.56, -1.20]	.001
<b>Anxiety<sup>2</sup></b>				
Being quarantined <sup>a</sup>	3.52 (0.78)	0.23	[1.96, 5.07]	<.001
Previous psychiatric disorder <sup>a</sup>	2.98 (0.80)	0.19	[1.39, 4.56]	<.001
Monthly income <sup>c</sup>	-1.61 (0.41)	-0.19	[-2.44, -0.79]	<.001
<b>Stress<sup>3</sup></b>				
Being quarantined <sup>a</sup>	3.21 (1.00)	0.16	[1.22, 5.16]	.002
Previous psychiatric disorder <sup>a</sup>	3.96 (1.02)	0.20	[1.94, 5.95]	<.001
Reorganized working hours for COVID-19 outbreak <sup>a</sup>	-2.42 (0.84)	-0.15	[-4.09, -0.76]	.004

B: unstandardized coefficients; SE: standard error of the estimate;  $\beta$ : adjusted coefficients.

<sup>a</sup>(0: No(ref.)), 1: Yes); <sup>b</sup>Range 1-3 scale higher score means feels more safe; <sup>c</sup>Range 1-3 scale higher score means higher income.

<sup>1</sup>N=331, R<sup>2</sup>=0.230, F(5, 325)=19.40, P < .001.

<sup>2</sup>N=331, R<sup>2</sup>=0.140, F(3, 327)=17.71, P < .001.

<sup>3</sup>N=331, R<sup>2</sup>=0.115, F(3, 327)=14.11, P < .001.

a ratio of 74.9%, similar to a study conducted in Turkey with ED workers.<sup>22</sup> It was reported that the HCWs with high JS levels were more productive and more loyal to the establishments they worked.<sup>23</sup> For this reason, it is important to identify interventions that will increase JS during the pandemic.

Our results show that the ratios of depression, anxiety, and stress symptoms were 89.1%, 70.2%, and 60.1%, respectively, from mild to extremely severe at any level. Both the lack of research focusing on the EPs and the use of different methods in the evaluation of psychological symptoms make one-to-one interpretation of the existing findings difficult. In a pre-pandemic study conducted in Turkey, rates of depression and anxiety among the EPs were 15.1% and 14.6%.<sup>24</sup> During the pandemic, in a study among HCWs in Turkey, the prevalence of depression and anxiety symptoms were 77.6% and 60.2%, respectively.<sup>25</sup> In a meta-analysis of the studies conducted that combines the studies on coronavirus and influenza pandemics, the ratios of depression, anxiety, and stress were 38%, 45%, and 31%, respectively.<sup>26</sup> The findings of our study show that EPs were significantly affected by the pandemic. We can say that these psychological impacts in EPs are greater than other HCWs both in Turkey and other countries.<sup>24-26</sup> The reasons for these differences may be because Istanbul, where this survey has been made, is the most crowded city from the population point of view in Turkey; the increase in the workload of the EDs during the pandemic; the lack of preparation, experience, and adequate training for the pandemic.

Not feeling safe while working, 24-h shifts, being diagnosed with COVID-19, dissatisfaction with an EM career, and low monthly income predicted high depression levels. For high anxiety levels, being quarantined, history of psychiatric disorders, and low monthly income were predictors; for high stress levels, history of psychiatric disorders, being quarantined, and not reorganized working hours for COVID-19 outbreak were determined to be the predictors. The results of our study were consistent with the results reported in the literature, despite the differences arising from disusing the same variables.<sup>27,28</sup> Our results show that the individuals being diagnosed with COVID-19, being quarantined, and having psychiatric disorder histories carry risk of worse mental health. Evaluation of these symptoms are necessary for early mental health support. However, providing convenient working hours and reasonable periods for rests, identifying the reasons for not feeling safe and dissatisfaction with the EM career, supporting for economic well-being, and logistics were required to avoid worse mental health outcomes among the EPs.

The EE levels of the residents and GPs and the DP levels of residents were significantly higher than the specialists. JS was significantly higher in specialists than residents and GPs and significantly higher in residents than GPs. These findings are consistent with previous studies comparing

residents and specialists.<sup>8,29</sup> To the best of our knowledge, our study is the first one that makes comparisons related to GPs. In most of the EDs, the GPs and the residents make the first examination of nearly all the patients who are referred to the emergency services for medical care and in case of necessity consult with the specialists; they come across a great number of patients in urgent/critical and uncritical conditions. After all, since the number of shifts and working hours are a lot more, their workloads are heavier than the specialists. Under this load, the education of the residents related to EM also continues. The residents are expected to progress in both theoretical and practical fields and to be successful in the exams they take. On the other hand, following graduation from the school of medicine, the GPs start work by being appointed by the government. Working in the ED is not a choice for them. The work experiences of the specialists are greater than residents and GPs. These features can be considered as the reasons for the differences detected between professional groups in terms of burnout and JS. In our study, depression and anxiety levels were found to be significantly higher in residents and GPs than specialists. Exposure of increased viral load due to increased 24-h shifts, excessive workload and working hours, not feeling safe because of these circumstances, dissatisfaction with the EM career, and low income may be the factors resulting in high levels of depression and anxiety. The most vulnerable group is seen as GPs, and this can be considered as an important finding showing that EM is a challenging and job satisfaction-oriented profession.

While only 8.8% of the participants felt completely safe while working, 36% had a reduced willingness to work. Uncertainties regarding the disease (such as transmission routes and prognosis), carelessness/insensitivity of the patients relating to the proper usage of medical masks and isolation precautions may have increased the risk of transmission and decreased the sense of feeling safe. In addition, participants whose opinions were not taken into account by their chiefs and whose working hours and areas were not organized in accordance with the pandemic may have not felt safe while working. All these circumstances may have reduced the willingness to work in the ED.

### Limitations

This research has some limitations. Since the study is a cross-sectional study involving hospitals in a single city, only the relationship, not causality, can be implied. There is a potential response bias, as participants may not have completed the survey because of psychological stress or due to the time constraints and high workload caused by the outbreak. In contrast, it is also possible that distressed participants participated more because the subject of the survey is related to them. Therefore, compared with interviews, complete or complex information may not be obtained in questionnaires. As the data related to the



mental health status such as individual depression, anxiety, and stress levels or burnout levels of the participants before the COVID-19 outbreak are not available, it will not be possible to precisely determine the effect of the pandemic. Longitudinal studies are required for this. Since only EPs are investigated, it will be difficult to draw conclusions in terms of comparison with other specialties. Factors not examined in our survey may affect the study's findings.

## CONCLUSION

In conclusion, due to the rapid spread of the disease, the lack of definitive treatment, the lack of vaccine development, uncertainty about the effectiveness, and global supply of the vaccines to be developed, the struggle against COVID-19 will take a long time. Preventing burnout and maintaining the mental health of EPs, who are at the forefront of this struggle, are just as important as fighting with disease. The results of this study show that EPs are under a considerable risk for burnout, depression, anxiety, and stress; residents and GPs have higher levels of emotional burnout, depression, and anxiety than specialists. This study presents the relations between the subscales of burnout, depression, anxiety, and stress symptoms and other investigated factors in detail. In the light of our findings and the findings in literature, it is recommended that evidence-based interventions that can promote mental well-being, increase JS, and prevent burnout be developed.

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