PHYSICIAN BURNOUT LEVELS AND ASSOCIATED FACTORS IN THE COVID-19 PANDEMIC

Yilmaz Sinan,[1] Koşan Zahide,[1] Bilge Yerli Ezel,[1] Çınar Tanriverdi Esra,[2] İba Yılmaz Sibel[3]

[1] Atatürk University Faculty of Medicine Department of Public Health Erzurum, Erzurum, Turkey
[2] Atatürk University Faculty of Medicine Department of Medical Education Erzurum, Turkey
[3] University of Health Sciences Erzurum Faculty of Medicine Erzurum, Erzurum, Turkey

Abstract: **Introduction:** Burnout, characterized by emotional exhaustion, depersonalization, and low personal accomplishment, is frequently observed in physicians.

Aim: The purpose of this study was to determine burnout levels and associated factors in physicians during the pandemic.

Material and Method: This cross-sectional study was performed online with 288 physicians from various fields in Erzurum. Sociodemographic questions and the Maslach Burnout Inventory represented the data collection tools. The data were collected online in May and June 2021.

Statistical analysis: Descriptive statistics, Student's t and ANOVA tests And Multiple ordinal logistic regression analysis were used. *p* values < 0.05 were regarded as significant. Analysis was performed on SPSS 22.

Results: Physicians' mean emotional exhaustion, depersonalization, and personal accomplishment component scores were 20.1 ± 8.3, 6.7 ± 4.5, and 21.1 ± 4.5, respectively. Analysis showed that 49.7% of physicians exhibited moderate-high emotional exhaustion, 35.8% high-moderate depersonalization, and 69.8% signs of low personal accomplishment. Job title, regret concerning selecting the medical profession, satisfaction with the working environment, number of additional monthly out-of-hours shifts worked, regular sporting activity, and assessment of the physical conditions in the working environment emerged as factors affecting burnout components at regression analysis.

Conclusion: The participants' burnout levels were high. The planning of effective interventions addressing individual and work-related factors with a holistic approach is essential to halt this rapidly growing epidemic.

Keywords: Burnout, Physicians, COVID-19, Pandemic, Maslach Burnout Inventory.

INTRODUCTION

The concept of occupational burnout, first introduced by Freudenberg in the 1970s, has been defined as a state of exhaustion resulting from excessive demands on individuals' energy, strength, or resources (1). Maslach et al. conceptualized burnout under three dimensions (emotional exhaustion, depersonalization, and low personal accomplishment). Emotional exhaustion occurs when a worker has no more emotional resources to give to others. Depersonalization, characterized by a negative and mocking attitude, emerges in association with the exhaustion of emotional resources. The third component of the concept of burnout is that the individual develops a tendency to evaluate himself negatively in the context of his work, in other words, loss of personal accomplishment (2).

Burnout emerges as a result of work-related stress among workers with close interaction with other people and in high-intensity occupations (1). Burnout is therefore common among health sector workers, particularly physicians, and nurses (3). Prevalence figures for burnout reported among physicians vary widely, from 0% to 80.5% (4, 5).

Burnout is linked to a series of problems including organizational and personal factors (5, 6). In addition to certain demographic variables, studies have described mental fatigue and stress resulting from workload, an excessive burden of responsibility, extensive and complex medical record procedures, long and irregular working hours, compromise of work-life balance, malpractice anxiety, unsatisfactory salaries, time pressure, and high patient expectations as the principal causes of burnout (6–8).

Physician burnout must be considered due to its impacts on the health system, patient care, and doctor health (9). Research has linked physician burnout to

loss of productivity, lack of job satisfaction, and early departure from the profession (6, 9).

In addition to its deleterious effects on physician health, burnout is also an important factor requiring investigation due to its impacts on patient care and health systems. The determination of burnout levels becomes even more important in conditions involving heavy working conditions for many physicians, such as the COVID-19 pandemic.

The purpose of this study was to evaluate physician burnout levels and the direct and interactive roles of associated factors.

MATERIAL AND METHODS

The study population of this cross-sectional study consisted of physicians working in Erzurum.

The study sample was calculated for a 75% emotional burnout frequency (10), 5% error, and 95% confidence level on Epi-Info software, and we planned to contact 275 participants by applying 10% correction.

In the study, a 27-item personal information form investigating the sociodemographic characteristics of the participants and the Maslach Burnout Inventory (MBI) to measure their burnout levels were used as data collection tools. In addition to demographic questions, the personal information form consisted of questions about sports, vacation, habits, field of specialization, title, length of work in the profession, shift, thoughts about career choice, working environment, in-service training and congress activities, and academic publications.

Maslach Burnout Inventory was developed by Maslach and Jackson (2) and adapted into Turkish by Ergin (11). This Likert-type scale (1 = never, 2 = very seldom, 3 = sometimes, 4 = usually, 5 = always) consists of 22 items. Burnout is evaluated under three subdimensions; The emotional exhaustion (EE) dimension is evaluated in items 1, 2, 3, 6, 8, 13, 14, 16, and 20, depersonalization (DP) in items 5, 10, 11, 15, and 22, and personal accomplishment (PA) in items 4, 7, 9, 12, 17, 18, 19, and 21. The EE and DP dimensions consist of negative statements and the PA dimension of positive statements. High EE and DP scores and low PA scores are associated with higher levels of burnout. Scores obtained on the scale are associated with burnout at three different levels – EE, low ≤ 20, moderate 21-27, and high ≥ 28, DP - low ≤ 8, moderate 9-12, and high ≥ 13 and PA - low ≤ 23, moderate 24-27, and high ≥ 28 (12).

The study data were collected in May-June 2021.

Approval for the study was obtained from the Atatürk University Non-Interventional Clinical Research Ethical Committee. Participants completing the data collection tool sent to them electronically were regarded as consenting to take part. No personal information was collected within the scope of the study, and all data were kept secret.

Data analysis was performed on Statistics Package for Social Sciences (version 22). Categorical variables were presented as numbers and percentages, and numerical variables as mean ± standard deviation. Normality of the distribution of numerical variables was evaluated using the Kolmogorov-Smirnov test, z values calculated for skewness and kurtosis, and chart methods. Student's t-test and One-Way ANOVA, the Kruskal Wallis and Mann Whitney U tests, and the Mann Whitney U test with Bonferroni correction at posthoc analyses were employed in the analysis of continuous variables, while chi-square tests were applied in the analysis of categorical variables. Spearman's rho correlation analysis was applied to investigate relationships between continuous variables. Ordinal logistic regression analysis was applied to evaluate the independent variables affecting the probability of inclusion of participants in the EE, DP, and PA groups determined based on defined cut-off points. p values < 0.05 were regarded as significant for all analyses.

RESULTS

The mean age of the 288 physicians included in the study was 38.1 ± 8.6, and 147 (51%) were women. The physicians; mean EE, DP, and PA dimension scores were 20.1 ± 8.3, 6.7 ± 4.5, and 21.1 ± 4.5, respectively. The distribution of burnout dimensions of physicians according to cut-off points is presented in Table 1.

Male and female participants exhibited similar mean EE, DP, and PA scores (p > 0.05). Married physicians (73.3%) and those with children (63.9%) exhibited significantly lower DP scores (p = 0.030 and p = 0.012, respectively), while their PA scores were significantly higher (p = 0.029 and p = 0.002, respec-

Table 1. Distribution of physicians' burnout dimensions by cut-off points

Dimension	Categories		
	Low n (%)	Moderate n (%)	High n (%)
Emotional Exhaustion	145 (50.3)	88 (30.6)	55 (19.1)
Depersonalization	185 (64.2)	76 (26.4)	27 (9.4)
Personal Accomplishment	201 (69.8)	65 (22.6)	22 (7.6)

Table 2. Distribution of some personal characteristics according to physicians' burnout dimension scores

	n (%)	EE Mean ± SD / Median (Q_1-Q_3)	DP Mean ± SD / Median (Q_1-Q_3)	PA Mean ± SD / Median (Q_1-Q_3)
Gender		p = 0.474	p = 0.415	p = 0.255
Male	141 (49.0)	19.7 ± 8.7	6.4 ± 4.8	21.4 ± 4.4
Female	147 (51.0)	20.4 ± 7.9	7.0 ± 4.2	20.8 ± 4.5
Marital status		p = 0.238	**p = 0.030**	**p = 0.029**
Married	211 (73.3)	19.7 ± 8.4	6.4 ± 4.5	21.5 ± 4.4
Single/Widowed/Divorced	77 (26.7)	21.0 ± 8.0	7.7 ± 4.5	20.2 ± 4.8
Possession of children		p = 0.150	**p = 0.012**	**p = 0.002**
Yes	184 (63.9)	19.6 ± 8.0	6.2 ± 4.3	21.8 ± 4.3
No	104 (36.1)	21.0 ± 8.6	7.6 ± 4.7	20.0 ± 4.6
Monthly income		p = 0.733	p = 0.307	**p = 0.001**
5001-10.000 TL	103 (35.8)	19.9 ± 8.7	6.6 ± 4.2	19.9 ± 4.1[a, b]
10.001-15.000 TL	133 (46.2)	20.5 ± 7.9	7.1 ± 4.2	21.6 ± 4.7[a]
> 15.000 TL	52 (18.1)	19.5 ± 8.3	6.0 ± 4.4	22.5 ± 4.2[b]
Regular sporting activity		**p = 0.007**	**p = 0.001**	**p < 0.001**
Yes	45 (15.6)	16.0 (10.0-25.0)	4.0 (2.0-8.0)	25.0 (20.0-27.0)
No	243 (84.4)	21.0 (16.0-27.0)	7.0 (3.0-10.0)	21.0 (18.0-24.0)
Taking vacations		p = 0.166)	p = 0.666	p = 0.352
Every year	33 (11.5)	20.0 (13.0-25.0)	6.0 (3.0-10.0)	22.0 (18.0-25.0)
Occasionally	112 (38.9)	21.5 (16.0-27.5)	7.0 (3.0-10.0)	22.0 (18.0-25.0)
Never	143 (49.7)	18.0 (13.0-26.0)	8.0 (1.0-10.0)	20.0 (17.0-23.0)
Chronic disease		p = 0.352	p = 0.466	p = 0.255
Yes	67 (23.3)	20.9 ± 8.0	6.4 ± 4.0	21.7 ± 4.8
No	221 (76.7)	19.8 ± 8.3	6.8 ± 4.6	21.0 ± 4.4
Smoking status		p = 0.158	p = 0.260	p = 0.893
Smoker	65 (22.6)	22.0 (16.0-27.0)	7.0 (3.0-11.0)	21.0 (18.0-25.0)
Quit	36 (12.5)	23.0 (18.0-27.5)	8.0 (4.0-10.0)	20.0 (18.0-24.0)
Never smoked	187 (64.9)	19.0 (13.0-25.0)	7.0 (3.0-9.0)	21.0 (18.0-25.0)
Alcohol consumption status		p = 0.111	p = 0.288	p = 0.576
User	7 (2.4)	25.0 (18.0-35.0)	8.0 (7.0-16.0)	19.0 (16.0-25.0)
Occasional use	67 (23.3)	21.0 (16.0-27.0)	8.0 (4.0-10.0)	21.0 (19.0-25.0)
Non-user	214 (74.3)	20.0 (13.0-26.0)	6.0 (2.0-10.0)	21.0 (18.0-25.0)

[a, b, c]: Category pairs that differ significantly in terms of the relevant dependent variable at post hoc analysis.
EE: Emotional Exhaustion, DP: Depersonalization, PA: Personal Accomplishment

tively). There were significant differences between physicians' PA scores according to their income levels (p = 0.001), and PA increased with income level. Physicians who had regular sporting activity (15.6%) registered significantly lower EE and DP scores and significantly higher PA scores (p = 0.007, p = 0.001, and p < 0.001, respectively) (Table 2).

It was observed that the score distributions of the physicians for all three dimensions of burnout were similar according to the branches (p > 0.05 for all). EE and DP scores were significantly higher in physicians (51.7%) who were actively working in shifts (p < 0.001). The distribution of scores for all three dimensions of burnout differed significantly according to the

physicians' regret about their choice of profession (p < 0.001 for all) (Table 3). In addition, the score distributions for all three burnout dimensions were significantly different according to their satisfaction with the working environment and physical conditions, attending various training meetings, and following academic publications (p < 0.001 for all) (Table 3).

The results of multiple rank regression analysis applied to determine the factors affecting the burnout dimensions are presented in Table 4. In the EE dimension, female gender, low income, job title, regret about the choice of profession, and satisfaction with the working environment, were found to be significantly related factors (p < 0.05 for all). On the other hand, the

Table 3. *Distributions of physicians' burnout dimension scores according to occupational and workplace environment factors*

	n (%)	EE Mean ± SD / Median $(Q_1\text{-}Q_3)$	DP Mean ± SD / Median $(Q_1\text{-}Q_3)$	PA Mean ± SD / Median $(Q_1\text{-}Q_3)$
Job title		**p < 0.001**	**p = 0.030**	**p = 0.001**
General practitioner	60 (20.8)	23.5 (15.0-30.5)[a]	7.5 (4.0-10.0)	21.0 (19.0-24.0)
Research assistant physicians	57 (19.8)	21.0 (17.0-26.0)[b]	8.0 (4.0-11.0)[a]	19.0 (17.0-22.0)[a]
Specialist physician	96 (33.4)	23.0 (16.0-27.0)[c]	7.0 (3.0-9.0)	20.0 (17.5-24.0)[b]
Academic	75 (26.0)	16.0 (10.0-20.0)[a, b, c]	5.0 (2.0-8.0)[a]	23.0 (20.0-26.0)[a, b]
Branch of specialization		p = 0.100	p = 0.440	p = 0.152
Basic	26 (9.0)	18.5 (10.5-21.3)	7.0 (2.8-10.0)	20.0 (18.0-22.3)
Internal	135 (46.9)	20.0 (15.0-25.0)	6.0 (3.0-9.0)	21.0 (18.0-25.0)
Surgical	67 (23.3)	22.0 (16.0-26.0)	8.0 (2.0-11.0)	22.0 (18.0-25.0)
Out-of-hours shifts		**p < 0.001**	**p < 0.001**	p = 0.263
Yes	149 (51.7)	22.0 ± 8.0	7.7 ± 4.6	20.9 ± 4.7
No	139 (48.3)	18.1 ± 8.1	5.7 ± 4.1	21.4 ± 4.2
Regret about choice of profession		**p < 0.001**	**p < 0.001**	**p < 0.001**
No	90 (31.3)	14.5 (9.0-20.0)[a, b]	4.0 (2.0-8.0)[a]	23.0 (20.0-26.0)[a, b]
Sometimes	128 (44.4)	21.0 (16.0-25.5)[a, c]	7.0 (4.0-9.0)	21.0 (18.0-24.0)[a]
Frequently	70 (24.3)	27.0 (22.0-32.0)[b, c]	9.0 (4.0-11.0)[a]	19.0 (16.0-22.0)[b]
Satisfaction (with working environment)		**p < 0.001**	**p < 0.001**	**p < 0.001**
Yes	78 (27.1)	13.0 (8.0-18.0)[a, b]	4.0 (2.0-8.0)[a, b]	23.0 (20.0-26.0)[a, b]
Slightly	150 (52.1)	23.0 (18.0-27.0)[a]	7.0 (4.0-10.0)[a]	20.0 (17.0-23.0)[a]
No	60 (20.8)	24.5 (20.5-32.5)[b]	8.0 (4.0-10.5)[b]	20.0 (18.0-22.5)[b]
Evaluation of physical working conditions		**p < 0.001**	**p < 0.001**	**p < 0.001**
Adequate	81 (28.1)	16.0 (8.0-23.0)[a, b]	4.0 (2.0-7.0)[a, b]	23.0 (20.0-26.0)[a]
Slightly adequate	146 (50.7)	20.0 (16.0-26.0)[a, c]	7.5 (4.0-10.0)[a]	20.5 (18.0-24.0)
Inadequate	61 (21.2)	25.0 (20.0-30.0)[b, c]	8.0 (5.0-12.0)[b]	19.0 (17.0-23.0)[b]
Participation in training sessions, seminars, and congresses		**p < 0.001**	**p = 0.023**	**p < 0.001**
Yes	140 (48.6)	18.0 (12.5-32.5)	6.1 ± 4.3	22.0 (19.0-28.0)
No	148 (51.4)	23.0 (16.0-35.0)	7.3 ± 4.6	20.0 (17.0-29.0)
Reading academic publications		**p < 0.001**	**p < 0.001**	**p < 0.001**
Yes	131 (45.5)	18.0 (11.0-30.0)	5.0 (2.0-13.0)	22.0 (19.0-30.0)
No	157 (54.5)	23.0 (18.0-35.0)	8.0 (5.0-16.0)	20.0 (17.0-27.0)

[a, b, c]: Refers to category pairs that differ significantly in terms of the relevant dependent variable at post hoc analyses.
EE: Emotional Exhaustion, DP: Depersonalization, PA: Personal Accomplishment

number of non-working shifts, regular sporting activity, and regret about profession choice were factors related to the DP dimension. Regular sporting activity, regret about the choice of profession, and physical working conditions were significantly associated with the ranking categories of the PA dimension (p < 0.05 for all).

DISCUSSION

Burnout is a cognitive process emerging from the interaction of personal and work-related factors. This study produced a general framework in terms of burn-out levels among physicians and related factors during the COVID-19 pandemic, which involved difficult working conditions for many physicians. The study also yielded results concerning the interactive role of factors associated with burnout.

Moderate-high EE was observed in almost half the physicians in this study. Moderate-high DP was present in one-third of the physicians, and moderate-low PA levels in more than two-thirds. Our findings generally show high levels of burnout in physicians working in our region. High prevalences of burnout are reported for physicians in the majority of studies, although

Table 4. Results of multiple ordinal logistic regression analysis evaluating factors determining the probability of physicians being in the different burnout dimension categories

Dimensions	Variables	Categories	Estimate	SE	OR	CI 95% for OR Lower	CI 95% for OR Upper	Wald	p
EE	Gender	Female Male	0.542	0,274	1.719 1	1.005	2.942	3.913	**0.048**
	Regular sporting activity	No Yes	0.263	0.432	1.301 1	0.558	3.034	0.369	0.543
	Monthly income	5000-10,000 TL 10,001-15,000 TL ≥ 15,001 TL	-1.312 -0.605	0.428 0.404	0.269 0.546 1	0.116 0.247	0.623 1.205	9.388 2.245	**0.002** 0.134
	Out-of-hours shifts	No Yes	-0.522	0.304	0.593 1	0.327	1.077	2.947	0.086
	Job title	General practitioner Research assistant physician Specialist Academic	2.066 1.292 1.043	0.503 0.516 0.42	7.893 3.640 2.838 1	2.945 1.324 1.246	21.155 10.008 6.464	16.899 6.277 6.163	**< 0.001** **0.012** **0.013**
	Regret about choice of profession	No Sometimes Frequently	-1.936 -1.233	0.407 0.316	0.144 0.291 1	0.065 0.157	0.320 0.541	22.588 15.177	**< 0.001** **< 0.001**
	Satisfaction	Yes Some No	-2.49 -0.765	0.491 0.327	0.083 0.465 1	0.032 0.245	0.217 0.883	25.692 5.461	**< 0.001** **0.019**
	Reading academic publications	No Yes	0.355	0.334	1.426 1	0.741	2.745	1.129	0.288

Model fitting: $\chi^2 = 136.605$, p < 0.001; Cox&Snell R^2: 0.378, Nagelkerke R^2: 0.434

Dimensions	Variables	Categories	Estimate	SE	OR	CI 95% for OR Lower	CI 95% for OR Upper	Wald	p
DP	Number of out-of-hours shifts		0.228	0.074	1.256	1.086	1.452	9.38	**0.002**
	Marital status	Single Widowed / Divorced Married	0.894 0.986	0.603 1.12	2.445 2.680 1	0.750 0.298	7.972 24.076	2.199 0.775	0.138 0.379
	Children	No Yes	-0.713	0.588	0.490 1	0.155	1.552	1.475	0.225
	Regular sporting activity	No Yes	1.891	0.923	6.626 1	1.085	40.451	4.202	**0.040**
	Job title	General practitioner Research assistant physician Specialist Academic	1.333 0.164 -0.35	0.779 0.687 0.623	3.792 1.178 0.705 1	0.824 0.307 0.208	17.459 4.529 2.389	2.924 0.057 0.315	0.087 0.811 0.575
	Regret about choice of profession	No Sometimes Frequently	-0.608 -1.614	0.56 0.481	0.544 0.199 1	0.182 0.078	1.632 0.511	1.182 11.261	0.277 **0.001**
	Evaluation of physical conditions	Adequate Slightly adequate Inadequate	-0.129 0.668	0.518 0.568	0.879 1.950 1	0.318 0.641	2.426 5.937	0.062 1.382	0.803 0.240

Model fitting: $\chi^2 = 44.251$, p < 0.001; Cox&Snell R^2: 0.266, Nagelkerke R^2: 0.313

		B	SE	OR	CI	CI	Wald	p
PA	Age	-0.044	0.052	0.957	0.864	1.060	0.713	0.398
	Length of time in the profession	0.061	0.052	1.063	0.960	1.177	1.383	0.240
	Marital status — Single	-0.718	0.414	0.488	0.217	1.098	3.009	0.083
	Widowed / Divorced	0.569	0.635	1.766	0.509	6.132	0.802	0.370
	Married			1				
	Monthly income — 5000-10,000 TL	-0.811	0.443	0.444	0.187	1.059	3.343	0.068
	10,001-15,000 TL	0.208	0.371	1.231	0.595	2.548	0.314	0.575
	≥ 15001 TL			1				
	Regular sporting activity — No	-1.061	0.377	0.346	0.165	0.725	7.914	**0.005**
	Yes			1				
	Regret about choice of profession — No	1.422	0.416	4.145	1.834	9.369	11.695	**0.001**
	Sometimes	0.447	0.404	1.564	0.708	3.452	1.222	0.269
	Frequently			1				
	Evaluation of physical conditions — Adequate	-0,71	0,322	0.492	0.262	0.924	4.865	0.057
	Slightly adequate	-0,175	0,411	0.839	0.375	1.879	0.181	0.671
	Inadequate			1				

Model fitting: χ² = 63.172, p < 0.001; Cox&Snell R²: 0.197, Nagelkerke R²: 0.249

EE: Emotional Exhaustion, DP: Depersonalization, PA: Personal Accomplishment,
SE: Standart error, OR: Odds Ratio, CI: Confidence Interval

the results vary widely (3, 4, 10, 13). The prevalence of general and subdimension burnout may vary in association with regional, national, and cultural effects, the health system, human factors, and patients' levels of education. The methodology and measurement tools employed may also affect the results.

Mean age was negatively correlated with DP levels in this study and positively correlated with PA. However, no association was observed between EE categories and age. On the other hand, Koşan and Özkula reported low EE scores in the young physician group and high PA scores in the elderly physicians (10, 14). In a study of 2576 Chinese physicians investigating the relationship between organizational and patient factors and burnout, Cheng et al. observed the highest level of burnout in the 35-44 age group (13). Ashraf's study of physicians from Pakistan reported similar findings (15). According to Maslach, age is the demographic variable most consistently associated with burnout, with younger physicians having a higher risk of burnout (6).

Burnout component scores in the present study were similar between male and female physicians. However, the female gender was associated with higher EE levels in the regression model (OR = 1.7). Our findings are compatible with the previous literature (6, 10, 14, 15). However, it is clear that female doctors working in departments where workplace conflicts, workload, and stress are intense, are victims of burnout at higher levels than men (9, 16, 15). The gender differences observed in terms of burnout may be attributable to the greater responsibilities assumed by women outside their working lives compared to men, and the variation in this depends on prevailing social structures.

Married physicians registered significantly lower DP scores and higher PA scores in the present study. DP scores were lower among married physicians, but the difference was not statistically significant. These results are consistent with the local literature (14). In terms of marital status, non-married participants are known to be more disposed to burnout than married physicians (6, 17). However, some studies have also reported no association between marital status and burnout (18). The inconsistency in the results for burnout may be due to factors such as the nature of society and the meaning that individuals attach to the institution of marriage.

Physicians with children in this study registered lower DP scores and significantly higher PA scores. EE scores were lower among physicians with children, although the difference compared to those without children was not statistically significant. In a study of 324 general practitioners performed in 2019, Uyar et al. also reported significantly lower DP scores among participants with children (19). However, other studies have linked having children to high burnout levels. In their study of 1811 Chinese neurologists, Tian et al. reported a lower risk of burnout among participants with no children (17). Having children can sometimes affect burnout levels due to the psychological support it provides in terms of commitment to life and sometimes due to the various responsibilities it imposes on parents.

PA scores in the present study were significantly higher in the high-income physician group, and PA scores were correlated with income. Unsatisfactory physician salaries are regarded as one of the determinants of work-related stress factors and thus, burnout (6, 7). Although some studies have linked low wages to high burnout levels (13, 15), others have found no link between pay and burnout (17). It appears that physicians' satisfaction with their pay varies between countries and exhibits show differing relationships with burnout levels.

EE and DP scores were lower, while PA scores were higher, among physicians who engaged in regular sporting activity in this study. Similar findings have been reported in other studies from our region (10, 20). Regular sporting activity may be a means of coping with stress and preventing burnout.

No relationship was found in the present study between burnout and taking vacations, the presence of chronic disease, smoking, or alcohol use. However, Koşan reported a higher risk of burnout among physicians who did not take vacations and those who smoked (10). Burnout may increase the prevalence of alcohol use among troubled physicians (21–23).

Significant differences were observed in this study in burnout component scores depending on physicians' job titles. Being on the lower rungs of the career ladder appears to be associated with higher burnout levels. Being a general practitioner was found to be a significant predictor of being in a higher EE category compared to being an academic (OR = 7.9). Other risk factors increasing EE levels compared to academics were being a research assistant physician (OR = 3.6) or a specialist (OR = 2.8). Our findings are compatible with other studies from our region (10). In Dyrbye et al.'s study of 3574 general practitioners evaluating the factors associated with burnout symptoms and regret over career choice, burnout was reported in almost half of the participants (21). However, some studies have reported a low prevalence of burnout among general practitioners (3). The differences in burnout figures in career terms may derive from countries' different health systems.

Physicians who worked out-of-hours shifts registered significantly higher EE and DP scores in this study. A significant correlation was observed between the number of monthly out-of-hours shifts worked and component scores. Monthly out-of-hours shift numbers also emerged as an independent variable determining DP levels (OR = 1.2). Koşan also noted a high prevalence of burnout among physicians with extra shift duties and working more than six of these a month (10). Özkula reported significantly lower EE and DP scores among physicians not working out-of-

hours shifts but observed no variation in terms of the number of monthly out-of-hours shifts worked (14). There are results in the literature that support our findings (24). Intensive working hours also involving night shifts may exacerbate burnout levels due to loss of concentration, risk of error, and possibly also an increase in anxiety levels.

Physicians who frequently experienced regret over their choice of career exhibited the lowest EE and DP scores and the lowest PA scores in this study. Physicians with no regrets concerning their choice of profession have a much lower likelihood of low EE levels. However, occasional feelings of regret over career choice appear to be significantly associated with the likelihood of being in the low DP category. Similar findings have also been reported in previous studies (17, 21).

In addition to personal factors, environmental factors are also associated with burnout (9, 23). In the present study, physicians who were not satisfied with their working environment in general and found their physical conditions inadequate registered significantly higher EE and DP scores, and significantly lower PS scores. However, the likelihood of being in the higher DP category was significantly lower among physicians who were satisfied or slightly satisfied with their working environment. Our findings are consistent with those of Koşan (10). The positive effects of physician- and family-friendly institutional environments on physician well-being and burnout levels are important issues emphasized in the literature (25).

EE and DP scores were significantly lower, while PA scores were significantly higher, among physicians who had taken part in such activities as training sessions, seminars, and congresses in the previous year and who read academic publications in their fields. In contrast, Cheng reported that regular clinical gatherings adversely impacted physicians' burnout levels (13). It appears that physicians regard occasional training activities as an opportunity to socialize and get away from the work environment and that these can thus positively affect burnout levels.

CONCLUSIONS

This study identified significant relationships between burnout levels and personal and work-related factors. Burnout is damaging for physicians, patients, and applications performed. In conclusion, burnout is an important condition that must be carefully evaluated from all dimensions, and holistic approaches addressing individual and organizational factors are needed to combat it.

There are several limitations to this study. In particular, problems deriving from the study's cross-sectional

methodology need to be considered in terms of determining causality. This study focused more on individual determinants of burnout, and further studies are now needed to identify potential organizational and work environment-related determinants. In addition, the fact that the study data were collected online may have limited the representation capacity of the study population.

Study Information

Department of the study: Atatürk University Faculty of Medicine, Department of Public Health

Working place: Erzurum/Turkey

Abbreviations

DP — Depersonalization
EE — Emotional exhaustion
MBI — Maslach Burnout Inventory

PA — Personal accomplishment

Licensing

Author Contributions:

Sinan Yılmaz: Planning, Data collection, Statistical analysis, Article writing, Reduction, Editing; **Zahide Koşan:** Data collection, Article writing, Reduction, Editing; **Ezel Bilge Yerli:** Data collection, Article writing, Reduction, Editing; **Esra Çınar Tanrıverdi:** Data collection, Article writing, Reduction, Editing; **Sibel İba Yılmaz:** Data collection, Article writing, Reduction, Editing.

Sažetak

NIVOI BURNOUT SINDROMA I POVEZANI FAKTORI KOD LEKARA TOKOM PANDEMIJE KOVID-19

Yilmaz Sinan,[1] Koşan Zahide,[1] Bilge Yerli Ezel,[1] Çınar Tanriverdi Esra,[2] İba Yılmaz Sibel[3]

[1] Medicinski fakultet Univerziteta Ataturk, Katedra za Javno zdravlje Erzurum, Erzurum, Turska
[2] Ataturk Univerzitet, Medicinski fakultet, Katedra za medicinsku edukaciju Erzurum, Turska
[3] Univerzitet zdravstvenih nauka Erzurum, Medicinski fakultet Erzurum, Erzurum, Turska

Uvod: Sagorevanje na radu (burnout) koje karakteriše emocionalna iscrpljenost, depersonalizacija i niska lična dostignuća, često se primećuje kod lekara.

Cilj: Svrha ove studije bila je da se utvrdi nivo sagorevanja i povezani faktori kod lekara tokom pandemije.

Materijal i metode: Ova studija preseka je sprovedena onlajn sa 288 lekara iz različitih oblasti u Erzurumu. Sociodemografska pitanja i Maslaš upitnik za procenu sindroma sagorevanja na poslu su predstavljali alate za prikupljanje podataka. Podaci su prikupljeni onlajn u maju i junu 2021.

Statistička analiza: korišćena je deskriptivna statistika, Student t i ANOVA testovi i višestruka ordinalna logistička regresiona analiza. p vrednosti < 0,05 smatrane su značajnim. Analiza je obavljena na SPSS 22.

Rezultati: Prosečni rezultati emocionalne iscrpljenosti, depersonalizacije i ličnog postignuća lekara bili su 20,1 ± 8,3, 6,7 ± 4,5 i 21,1 ± 4,5, respektivno. Analiza je pokazala da je 49,7% lekara ispoljilo umereno-visoku emocionalnu iscrpljenost, 35,8% visoko umerenu depersonalizaciju, a 69,8% znake niskog ličnog postignuća. Titula, žaljenje zbog izbora medicinske profesije, zadovoljstvo radnim okruženjem, broj dodatnih mesečnih radnih smena van radnog vremena, redovna sportska aktivnost i procena fizičkih uslova u radnoj sredini pojavili su se kao faktori koji utiču na sagorevanje.

Zaključak: Nivoi sagorevanja učesnika su bili visoki. Planiranje efikasnih intervencija koje se bave individualnim faktorima i faktorima u vezi sa poslom sa holističkim pristupom je od suštinskog značaja za zaustavljanje ove brzo rastuće epidemije.

Ključne reči: Burnout, Lekari, COVID-19, Pandemija, Maslaš upitnik za procenu sindroma sagorevanja.

REFERENCES

1. Freudenberger HJ. Staff Burn-Out. Journal of Social Issues. 1974; 30(1): 159–65. doi: 10.1111/j.1540-4560.1974.tb00706.x.

2. Maslach C, Jackson SE. The measurement of experienced burnout. Journal of Organizacional Behavior, 1981; 2(2): 99-113. doi:10.1002/job.4030020205.

3. Bawakid K, Abdulrashid O, Mandoura N, Shah HBU, Ibrahim A, Akkad NM et al. Burnout of physicians working in

primary health care centers under Ministry of Health Jeddah, Saudi Arabia. Cureus. 2017; 9(11): e1877. doi:10.7759/cureus.1877.

4. Rotenstein LS, Torre M, Ramos MA, Rosales RC, Guille C, Sen S, et al. Prevalence of burnout among physicians: a systematic review. JAMA. 2018; 320(11): 1131–150. doi: 10.1001/jama.2018.12777.

5. Owoc J, Mańczak M, Jabłońska M, Tombarkiewicz M, Olszewski R. Association between physician burnout and self-reported errors: meta-analysis. J Patient Saf. 2022; 18(1): e180-8. doi: 10.1097/PTS.0000000000000724.

6. Maslach C, Schaufeli WB, Leiter MP. Job Burnout. Annu Rev Psychol. 2001; 52(1): 397–422. doi:10.1146/annurev.psych.52.1.397.

7. Beschoner P, Limbrecht-Ecklundt K, Jerg-Bretzke L. Psychische Gesundheit von Ärzten: Burnout, Depression, Angst und Substanzgebrauch im Kontext des Arztberufes [Mental health among physicians: Burnout, depression, anxiety and substance abuse in the occupational context]. Nervenarzt. 2019; 90(9): 961-74. German. doi: 10.1007/s00115-019-0739-x.

8. Grimes PE. Physician burnout or joy: Rediscovering the rewards of a life in medicine. Int J Womens Dermatol. 2019; 6(1): 34-6. doi: 10.1016/j.ijwd.2019.12.001.

9. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. J Intern Med. 2018; 283(6): 516-29. doi: 10.1111/joim.12752.

10. Kosan Z, Calikoglu EO, Guraksin A. Levels of burnout and their associated factors among physicians working in Northeast Anatolia. Niger J Clin Pract. 2018; 21(7): 875-81. doi: 10.4103/njcp.njcp_298_17.

11. Ergin, C. Burnout in doctors and nurses and adaptation of Maslach burnout scale. VII. National Psychology Congress;1992 , 22nd September Ankara, Turkey.

12. Ergin, C. Turkish health personnel norms of Maslach burnout scale. Journal of Psychiatry Psychology Psychopharmacology. 1996; 4(1): 28-33.

13. Cheng Y, Wang F, Zhang L, Zhang P, Ye B, Sun Y, Zhu X, Zhang N, Liang Y. Effects of organisational and patient factors on doctors' burnout: a national survey in China. BMJ Open. 2019; 9(7): e024531. doi: 10.1136/bmjopen-2018-024531.

14. Ozkula G, Durukan E. Burnout syndrome among physicians: the role of socio-demographic characteristics. Dusunen Adam. 2017; 30(2): 136–44. doi: 10.5350/DAJPN2017300207.

15. Ashraf F, Ahmad H, Aftab S. Interactive role of personal and work related factors in psychological burnout: a study of Pakistani doctors. J Pak Med Assoc. 2020; 70(8): 1413-7. doi: 10.5455/JPMA.35303.

16. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: a review. Behav Sci (Basel). 2018; 8(11): 98. doi: 10.3390/bs8110098.

17. Tian L, Pu J, Liu Y, Zhong X, Gui S, Song X, et al. Relationship between burnout and career choice regret among Chinese neurology postgraduates. BMC Med Educ. 2019; 19(1): 162. doi: 10.1186/s12909-019-1601-3.

18. Elhadi YAM, Ahmed A, Salih EB, Abdelhamed OS, Ahmed MHH, El Dabbah NA. A cross-sectional survey of burnout in a sample of resident physicians in Sudan. PLoS One. 2022; 17(3): e0265098. doi: 10.1371/journal.pone.0265098.

19. Uyar M, Eren G, Yücel M. Determining burnt level and job satisfaction of physicians working as research assistant in a university hospital and evaluation of affecting factors. Turkiye Klinikleri J Med Sci. 2021; 41(3): 234–41. doi: 10.5336/medsci.2021-81673.

20. Çinar Tanrıverdi E, Yılmaz S, Yerli Bilge E, Aras A, Koşan Z. Burnout levels of medical students in COVID-19 pandemic: a cross-sectional study. New Trends in Medicine Sciences. 2022; 3(1): 12–9.

21. Dyrbye LN, Burke SE, Hardeman RR, Herrin J, Wittlin NM, Yeazel M et al. Association of clinical specialty with symptoms of burnout and career choice regret among US resident physicians. JAMA. 2018; 320(11): 1114–30. doi:10.1001/jama.2018.12615.

22. Pförringer D, Mayer R, Meisinger C, Freuer D, Eyer F. Health, risk behaviour and consumption of addictive substances among physicians - results of an online survey. J Occup Med Toxicol. 2018; 13:27. doi: 10.1186/s12995-018-0208-7.

23. Lacy BE, Chan JL. Physician burnout: the hidden health care crisis. Clin Gastroenterol Hepatol. 2018; 16(3): 311-7. doi: 10.1016/j.cgh.2017.06.043.

24. Lin RT, Lin YT, Hsia YF, Kuo CC. Long working hours and burnout in health care workers: Non-linear dose-response relationship and the effect mediated by sleeping hours-A cross-sectional study. J Occup Health. 2021; 63(1): e12228. doi: 10.1002/1348-9585.12228.

25. Agency for Healthcare Research and Quality (AHRQ). Physician Burnout; 2022. Available from: https://www.ahrq.gov/prevention/clinician/ahrq-works/burnout/index.html.

Correspondence to/Autor za korespondenciju
Sinan Yılmaz
Phone: +90 505 546 76 93
Fax: +90 442 344 66 66
Address: Atatürk Mahallesi Atatürk Üniversitesi Tıp Fakültesi Morfoloji Binası A Blok Halk Sağlığı A.D.25240 Erzurum / Türkiye, email: dr_syilmaz@hotmail.com