

# The effects of working and living conditions of physicians on burnout level and sleep quality

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**KEYWORDS:** Sleep disorders; burnout syndrome; violence; mobbing; occupational stress

## ABSTRACT

**Background:** Burnout is a multidimensional syndrome associated with intense working conditions and negative psychosocial factors in physicians. The purpose of this study is to investigate the effects of living and working conditions of physicians on burnout level and sleep quality in Turkey. **Methods:** In this internet-based questionnaire study, 1053 physicians [General Practitioners (n=233); Basic Medical Sciences (n=26); Internal Medical Sciences (n=530), and Surgery Sciences (n=264)] were included in the study, filling the forms consisting of study conditions, Maslach Burnout Inventory (MBI) and the Pittsburgh Sleep Quality Index (PSQI) questions. **Results:** Negative occupational factors such as physicians having a night shift, high number of patients who are cared for daily, short examination period, low financial gain, exposure to violence, and mobbing were associated with poor sleep quality and burnout. Factors such as being subjected to violence, mobbing, and age are predictive of increasing burnout in women. Working on night shifts or being on-call were associated with all aspects of burnout. The proportion of those with poor sleep quality was significantly higher in those working night shifts (74.6%) than those working daytime shifts (67.2%) and those who were exposed to violence (75.1%) compared to those who were not exposed to violence (43.2%) ( $p=0.013$ ,  $p<0.001$ , respectively). **Conclusions:** Impaired sleep quality, violence, mobbing, young age, excessive night shifts, short examination period, and low income may play a role in physician burnout. Our study data suggest that it is important to improve physicians' unfavorable working conditions and to prevent violence against burnout.

## INTRODUCTION

Burnout syndrome is an important mental health problem in many occupational groups exposed to increased workload and socioeconomic strain (1). The definition of burnout as accepted today was made by Maslach (2, 3). Burnout consists of three dimensions: *emotional exhaustion* of the individual due to problems at work; *depersonalization*, defined

as negative, cold-distance and dismissive behaviors and attitudes against the people or colleagues in the workplace; and sense of inadequacy and perceived *personal accomplishment* resulting from the previous two dimensions (3). Emotional exhaustion (EE) is seen as the basis of these three components, and then it is thought that depersonalization and finally a decrease in the sense of accomplishment occur (4). Fatigue, tension, inadequacy, unhappiness, procrast-

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tionation behavior, attention, and focusing difficulties are observed in burnout. Many factors such as personality traits, marital status, having children, and income level that may affect coping capacity have been associated with burnout (5–7). Many other factors such as young age, lack of experience, unwanted choice of profession, the branch of surgical specialty, prolonged daily working time, number of patients treated, and violence exposed also cause an increase in the level of burnout (8–10). These risk factors mentioned playing a key role on the road to burnout, creating a significant burden on the person, causing a reduction in internal resources and difficulty in dealing with external factors. Advanced age, high income, and being married are shown as protective factors against burnout (10).

The World Health Organization (WHO) defines violence as: The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either result in or have a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation (11). Health workers are at increased risk of violence all over the world. Between 8% and 38% of health workers suffer physical violence at some point in their careers. Many more are threatened or exposed to verbal aggression. Violence has not only a negative impact on the psychological and physical well-being of healthcare staff but also affects their job motivation (12).

The incidence of burnout syndrome in physicians is gradually increasing. A meta-analysis reported that burnout syndrome was seen in 35.7% of physicians during residency (6). The level of burnout in physicians is higher than in the general population, and sleep-related factors can be determinant in the burnout level differences between their specialties (9, 10). Especially working with the shift system, prolonged working hours cause poor sleep quality and decreased total sleep time (13, 14). Impaired sleep time and quality have been associated with reduced attention, learning speed, response speed, and reduced ability to cope with daily problems (15, 16). It has been suggested that all this makes the person more susceptible to burnout (13, 15, 17).

In recent years, burnout syndrome is considered an important public health problem in physicians, and

many studies are carried out in this regard. Burnout levels of physicians are a very dynamic process, which is affected by many factors due to working conditions, health policies, and rapidly changing practices in health institutions. Our study has two important aims. The primary one is to determine the sociodemographic characteristics and working conditions that may be related to the burnout of physicians in Turkey. Secondly, it was aimed to determine the variables related to the sleep quality of physicians and to examine their relationship with burnout.

## METHODS

This study is an online cross-sectional survey study. The information form and scales used in the research were prepared with Google Form and applied throughout September 2019. A brief informative letter containing information about the study was shared with 11560 people (Facebook: n=6500, E-mail group: n=2500, WhatsApp group: n=2560) through social media groups that physicians are members of. One thousand one hundred forty-one people clicked on the study link and viewed the details of the research. Seventy-six of them left the study after reading the detailed information. Eight of them left the study, indicating that they did not want to participate in the study (Figure 1).

Forms and scales were delivered to 1141 physicians using social media networks; as a result, 1053 physicians were included in the study (Figure 1).

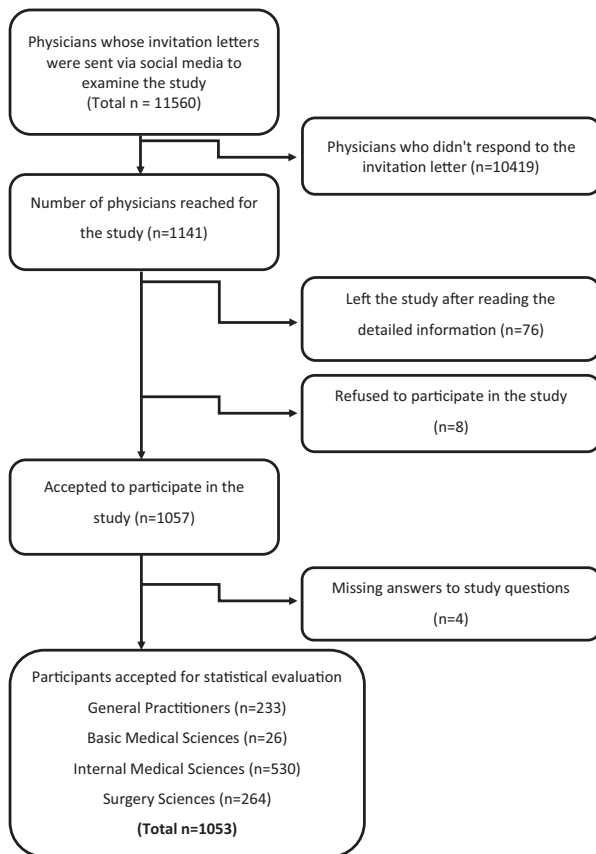
Informed consent of individuals has been obtained with Google Form. All stages of the research were carried out under the Helsinki Declaration, and the study was approved by the ethics committee (decision number: 2017-KAEK-189\_2018.06.20\_01).

## Measurement Tools

The sociodemographic data form, Maslach Burnout Inventory (MBI), and Pittsburgh Sleep Quality Index (PSQI) were applied to the participants.

### *The sociodemographic form*

The sociodemographic form was prepared by the researchers. It included the following in-



**Figure 1.** Flow chart of the participants in the study

formation: age, gender, marital status, number of children, the working conditions, professional information, whether they were exposed to physical, verbal, or both physical and verbal violence during their professional life.

### *Maslach Burnout Inventory*

Maslach Burnout Inventory was developed by Maslach and Jackson in 1981 (2). It consists of Emotional Exhaustion (EE), Personal Accomplishment (PA), and depersonalization (DP). Turkish validity and reliability study was done by Ergin in 1992 (18). EE and DP subscales are composed of negative expressions, and PA dimension consists of positive expressions. The increase in EE and DP scores indicates excessive burnout, and the increase in the PA score indicates low burnout.

### *Pittsburgh Sleep Quality Index*

Pittsburgh Sleep Quality Index was developed by Buysse et al. (19). The Turkish validity and reliability study was performed by Ağargün et al. (20). High scores indicate poor sleep quality and high sleep disturbance. A total score above 5 indicates that the sleep quality is poor clinically.

### **Statistical analysis**

SPSS (Statistical Package for Social Sciences, IBM Inc., Chicago, IL, USA) 22 package program was used for statistical evaluation. The significance level was determined as  $p < 0.05$ . Descriptive statistics of the data were calculated, and the Kolmogorov-Smirnov test was applied for normality distribution. The Chi-square test was used to compare categorical variables. Analysis of Variance (ANOVA) was applied in more than two independent group comparisons of variables such as burnout and PSQI scores according to physicians' group (general practitioners, residents, specialists, and academicians) that show normal distribution. Post hoc Tukey test was applied. Kruskal Wallis Test was applied in more than two independent group comparisons of variables such as burnout scores among specialist branches and sociodemographic data and PSQI scores that did not show the normal distribution in all groups, since the number of participants in the 'basic medical sciences' did not meet the parametric test conditions. For those with statistically significant results, the Mann-Whitney  $U$  test was applied along with Bonferroni correction to determine which groups were significant. These comparison results are given with 'corrected  $p$ ' in the article. Since sociodemographic data, information about working conditions, and scale scores did not show normal distribution, the Spearman correlation test was used in correlation examinations.

### **RESULTS**

Of 1053 participants, 59.8% were female, and 40.2% were men. Seventy-two point four percent of the physicians had poor sleep quality. When the sample divided into only those with night shifts (NS +), only those with on-call shifts (OS +), those with

both night shifts and on-call shifts (NSOS +), and those without night shifts or on-call shifts (NSOS -), the proportion of those with poor sleep quality was 79.9% in NS +, 70.9% in OS +, 71.1% in NSOS +, 67.2% in NSOS-. The difference between the groups was statistically significant ( $\chi^2=13.279$ ;  $p=0.004$ ). When the groups were divided into two as day shift workers and night shift workers, the proportion of those with poor sleep quality was 67.2% for those working during the day shift and 74.6% for those working night shifts. The proportion of those with

poor sleep quality, exposure to violence, and exposure to mobbing were statistically significantly higher in those working night shifts compared to those working in the daytime ( $p=0.013$ ,  $p<0.001$ ,  $p=0.009$ , respectively). The burnout levels (EE, DP, and PA) of night shift workers are significantly higher than day shift workers ( $p<0.001$ ) (Table 2).

Ninety-one point three percent of the physicians reported that they were exposed to any type of violence at least once in their professional lives. Other information about the sociodemographic

**Table 1.** Sociodemographic variables of physicians (n=1053) sleep quality, burnout levels, and exposure rates to violence.

Gender	n	%
Female	630	59.8
Male	423	40.2
Sleep Quality	n	%
Good	291	27.6
Poor	762	72.4
Exposure to violence	n	%
None	92	8.7
Verbal violence	769	73
Physical violence	12	1.1
Verbal and physical violence	180	17.1
Sociodemographic and working variables (n=1053)	Mean $\pm$ SD	Median (Minimum-maximum)
Age	39.75 $\pm$ 9.52	38 (24-67)
Number of children	1.15 $\pm$ 0.97	1 (0-4)
Duration in the profession (years)	15.12 $\pm$ 9.65	13 (1-42)
Working time in the last unit of duty (years)	1.28 $\pm$ 0.56	1 (1-3)
Used permit in a year (day)	18.23 $\pm$ 8.69	20 (0-70)
Income/monthly (TRY)	11133 $\pm$ 5375	10000 (1700-100000)
Number of patients examined in a day (n=1010)	56.91 $\pm$ 45.54	50 (1-360)
Examination time for a patient (minutes)	9.76 $\pm$ 9.27	5 (1-60)
Night shifts in a month (n=473)	5 $\pm$ 3.23	(1-16)
On-call shifts in a month (n=416)	10.65 $\pm$ 8-28	(1-31)
Preferring to be a physician <sup>a</sup>	7.87 $\pm$ 2.44	(1-10)
Recommend the profession of medicine to another person <sup>b</sup>	4.14 $\pm$ 2.63	(1-10)
Sleep quality and burnout levels	Mean $\pm$ SD	Median (Minimum-maximum)
PSQI	7.97 $\pm$ 3.47	8 (1-20)
Emotional exhaustion	21.02 $\pm$ 7.12	21 (0-36)
Depersonalization	7.65 $\pm$ 3.86	8 (0-20)
Personal accomplishment	19.31 $\pm$ 4.03	19 (2-31)

**PSQI:** Pittsburgh Sleep Quality Index; **SD:** Standard deviation; **n:** Number of participants; **\*1 point:** unwillingly, **10 points:** very willingly; **<sup>b</sup>1 point:** I would not recommend at all, **10 points:** I would definitely recommend.

data, working conditions, burnout levels, and sleep quality levels of the physicians are shown in Table 1. The burnout levels, PSQI scores, and poor sleep quality rates of physicians who experienced violence and thought that they were exposed to mobbing were significantly higher than those who did not experience violence and mobbing (Table 2). The effect of gender and marital status on burnout, sleep quality levels, and poor sleep quality are shown in Table 2.

Comparison of burnout levels, sleep quality, and income levels by general practitioners and specialist physicians (basic medical sciences, internal medical sciences, and surgical sciences) are presented in Table 3. The number of participants working in basic medical sciences was very small ( $n=26$ , 2.4%). Therefore, this group was excluded in the statistical analysis, and burnout dimensions and PSQI were compared among internal medical sciences, surgical sciences, and general practitioners. There was no statistically significant difference between the three groups in terms of burnout dimensions ( $p>0.05$ ). A statistically significant difference was found in terms of PSQI between these groups ( $p=0.008$ ). When physicians are divided into groups as general practitioners, residents, specialists, and academicians, statistically differences were found in EE, DP, PA, and PSQI. All aspects of burnout were significantly lower in academicians (in all  $p<0.001$ ). In addition, DP scores of residents were higher than specialists ( $p=0.039$ ). In terms of PA, residents have lower scores than general practitioners ( $p=0.014$ ), specialists ( $p=0.003$ ), and academicians ( $p<0.001$ ) (Table 3).

When the relationship with each burnout dimension was evaluated by including the professional duration, gender, and the number of children in the regression model, being a woman was found to be a significant predictor for EE ( $\beta=0,119$ ;  $t=3.901$ ;  $p<0.001$ ). The increase in professional duration explained the increase in PA scores ( $\beta=0.265$ ;  $t=8.035$ ;  $p<0.001$ ). The increase in professional duration was an important predictor in the decrease of EE ( $\beta=-0,228$ ;  $t=6.906$ ;  $p<0.001$ ) and DP scores ( $\beta=-0,282$ ;  $t=-8.645$ ;  $p<0.001$ ). When the effects on EE and DP scores were analyzed in the linear regression analysis by including gender and professional duration, the significant relationship between female gender and

EE was continued only ( $\beta=0,119$ ;  $t=3.899$ ;  $p<0.001$ ). The number of children and marital status did not contribute to the model in explaining any burnout dimension. Among the burnout dimensions among women, only EE significantly predicted the sleep quality ( $\beta=0.350$ ;  $t=6.980$ ;  $p<0.001$ ).

Women reported that they were exposed to more violence and mobbing than men (Table 2). At the same time, EE ( $t(609)=-0.557$ ;  $p<0.001$ ), DP ( $t(609)=-5.462$ ;  $p<0.001$ ) and PSQI total scores ( $p<0.001$ ) were higher in women who reported violence. When violence, mobbing, and gender variables were included in the regression model for evaluating further method, it was observed that significance was preserved in all models ( $p<0.001$ ), and their effects on EE were independent from each other. When mobbing and violence variables were included in the model, it was found that gender did not continue to explain DP scores significantly. In addition, violence ( $\beta=0.164$ ;  $t=5.324$ ;  $p<0.001$ ) and female gender ( $\beta=0.078$ ;  $t=2.547$ ;  $p=0.011$ ) were found to be significant predictors of the PA scores. When the sample divided into only those with NS+, only those with OS+, those with NSOS+ and those NSOS- there were significant differences between groups in EE ( $F(3,1026)=17.097$ ;  $p<0.001$ ), DP ( $F(3,1026)=17,082$ ;  $p<0,001$ ), PA ( $F(3,1026)=7,577$ ;  $p<0,001$ ), PSQI ( $F(3,1026)=3.022$ ;  $p=0.029$ ) scores.

EE was significantly lower in the NSOS- group ( $p<0.001$ ), but no difference was found between the other groups. DP scores of NSOS- group were found to be significantly lower than OS+ group ( $p=0.026$ ), NS+ group ( $p<0.001$ ) and NSOS+ group ( $p<0.001$ ). DP scores of NSOS+ group were higher than OS+ group ( $p=0.048$ ) but did not differ from NS+ ( $p=0.969$ ). The PA scores of NSOS- group was higher than OS+ group ( $p=0.033$ ), NS+ group ( $p<0.001$ ) and NSOS+ group ( $p=0.003$ ). There was a significant difference in sleep quality between NS+ and NSOS- groups ( $p=0.026$ ). In addition, the rate of exposure to violence was found to be higher in NS+ ( $\chi^2=24.728$ ;  $p<0.001$ ).

In the multiple regression model created to control the confounding factors related to sleep quality, a significant relationship was found between sleep quality and the number of night shifts. At the same time, there was no significant relationship with DP

**Table 2.** The effect of gender, mobbing, and violence on burnout, sleep quality levels, and poor sleep quality

Gender	Female (59.8%; n=630)		Male (40.2%; n=423)		Comparison	
	Mean ± SD		Mean ± SD		<i>t</i> +	<i>p</i>
EE	22.0±6.65		19.55±7.55		5.561	<0.001
DP	7.86±3.80		7.35±3.92		2.132	0.033
PA	19.02±3.82		19.75±4.29		-2.926	0.004
PSQI	8.22±3.50		7.62±3.41		2.767	0.006
	%	n	%	n	<i>x</i> <sup>2</sup>	<i>p</i>
Poor sleep quality	75.24	474	68.09	288	6.475	0.011
Exposure to violence	92.86	585	88.90	376	4.998	0.025
Exposure to mobbing	78.57	495	68.79	291	12.782	<0.001
Marital status	Single (23.84%; n=251) Mean ± SD		Married (76.16%; n=802) Mean ± SD		<i>t</i> +	<i>p</i>
EE	21.65±7.04		20.82±7.14		1.605	0.109
DP	8.54±3.81		7.38±3.83		4.182	<0.001
PA	18.82±4.16		19.47±3.98		-2.210	0.027
PSQI	8.53±3.61		7.80±3.41		2.921	0.004
	%	n	%	n	<i>x</i> <sup>2</sup>	<i>p</i>
Poor sleep quality	77.3	194	70.8	568	3.999	0.046
Shift working	Day shift workers (30.39%; n=320) Mean ± SD		Night shift workers (69.61%; n=733) Mean ± SD		<i>t</i> +	<i>p</i>
EE	18.73±7.45		22.01±6.74		-6.766	<0.001
DP	6.56±3.68		8.13±3.83		-6.186	<0.001
PA	20.04±4.34		18.99±3.84		3.918	<0.001
PSQI	7.53±3.55		8.17±3.41		-2.743	0.006
	%	n	%	n	<i>x</i> <sup>2</sup>	<i>p</i>
Poor sleep quality	67.2	215	74.6	547	6.161	0.013
Exposure to violence	84.1	269	94.4	692	29.892	<0.001
Exposure to mobbing	69.4	222	76.9	564	6.743	0.009
	No exposure to mobbing (25.4%; n=267) Median (IR)		Exposure to mobbing (74.6%; n=786) Median (IR)		<i>Z</i> ++	<i>p</i>
EE	18 (11)		22 (10)		-6.985	<0.001
DP	6 (6)		8 (6)		-5.632	<0.001
PA	20 (6)		19 (5)		-2.190	0.029
PSQI	6 (5)		8 (5)		-6.240	<0.001
	%	n	%	n	<i>x</i> <sup>2</sup>	<i>p</i>
Poor sleep quality	58.8	157	77.0	605	32.904	<0.001
	No exposure to violence (8.7%; n=92) Median (IR)		Exposure to violence (91.3%; n=961) Median (IR)		<i>Z</i> ++	<i>p</i>
EE	14 (8.75)		22 (9)		-8.367	<0.001
DP	4 (5)		8 (5)		-8.091	<0.001
PA	22 (4.75)		19 (6)		-5.712	<0.001
PSQI	5 (3.75)		8 (4)		-7.685	<0.001
	%	n	%	n	<i>x</i> <sup>2</sup>	<i>p</i>
Poor sleep quality	43.5	40	75.1	722	42.062	<0.001

+ Student *t*- test; ++ Mann-Whitney-*U* test; *x*<sup>2</sup>: Chi-square; **SD**: Standard deviation; **n**: Number of participants; **EE**: Emotional burnout; **DP**: Depersonalization; **PA**: Personal accomplishment; **PSQI**: Pittsburgh Sleep Quality Index; **IR**: Interquartile Range

**Table 3.** Comparison of income levels, burnout, and sleep quality levels by general practitioners and specialist departments

	General practitioners (n=233)		Basic Medical Sciences (n=26)		Internal Medical Sciences (n=530)		Surgery Sciences (n=264)		Comparison		
	Mean ± SD	Median (IR)	Mean ± SD	Median (IR)	Mean ± SD	Median (IR)	Mean ± SD	Median (IR)	Z+	p	
EE	21.32±7.20	22 (10)	17.03±6.17 <sup>a,b</sup>	17.5 (10)	21.39±7.13	21.5 (10)	20.39±6.99	21 (9)	12.418	0.006	
DP	7.77±3.84	8 (5)	7.0±3.86	7 (5.25)	7.62±3.84	8 (5)	7.67±3.91	7.5 (7)	0.934	0.817	
PA	19.23±3.95	19 (5.5)	18.57±5.13	20 (8)	19.16±3.93	19 (5)	19.73±4.14	20 (6)	3.245	0.355	
PSQI	8.39±3.54	8 (5)	6.69±3.15	6.5 (4.5)	7.74±3.48	7 (5)	8.20±3.35	8 (5)	11.984	0.008*	
Income/monthly (TRY)	9697±3345	9000 (3000)	9392±2885	9000 (3250)	11167±6367 <sup>c</sup>	10000 (5000)	12505±9307 <sup>d</sup>	11000 (5500)	82.896	<0.001	
	%	n	%	n	%	n	%	n	$\chi^2$	p	
Poor sleep quality	77.7	181	61.5	16	69.4	368	74.6	197	7.767	0.051	
	General practitioners (n=233)		Residents (n=133)		Specialists (n=561)		Academics (n=126)		F++		p
EE	21.32±7.20		21.30±6.76		21.60±6.99		17.53±6.98 <sup>e</sup>		11.926	<0.001	
DP	7.77±3.84		8.71±3.87		7.73±3.85		5.94±3.32 <sup>e</sup>		12.144	<0.001	
PA	19.23±3.95		17.93±3.90 <sup>f</sup>		19.27±3.96		21.08±3.96 <sup>g</sup>		13.834	<0.001	
PSQI	8.39±3.54		8.39±3.64		7.87±3.37		7.21±3.45 <sup>h</sup>		3.970	0.008	
	%	n	%	n	%	n	%	n	$\chi^2$	p	
Poor sleep quality	77.7	181	75.2	100	72.4	406	59.5 <sup>e</sup>	75	14.214	0.003	

+Kruskal-Wallis H, ++ANOVA (Analysis of Variance);  $\chi^2$ : Chi-square; **EE**: Emotional burnout; **DP**: Depersonalization; **PA**: Personal accomplishment; **PSQI**: Pittsburgh Sleep Quality Index; **SD**: Standard deviation; **n**: Number of participants; **IR**: Interquartile Range.

<sup>a</sup> Significantly lower than internal medical sciences (corrected  $p=0.015$ ). <sup>b</sup> Significantly lower than general practitioners (corrected  $p=0.019$ ). <sup>c</sup> Significantly higher than general practitioners (corrected  $p<0.001$ ). <sup>d</sup> Significantly higher than general practitioners, internal and basic medical sciences (corrected  $p<0.001$ ). <sup>e</sup> Significantly lower than general practitioners, residents, and specialists (corrected  $p<0.001$ ). <sup>f</sup> Significantly lower than general practitioners, specialists, and academicians (corrected  $p=0.014$ ;  $p=0.003$ ;  $p<0.001$ , respectively). <sup>g</sup> Significantly higher than general practitioners, residents, and specialists (corrected  $p<0.001$ ). <sup>h</sup> Significantly lower than general practitioners and residents (corrected  $p=0.012$ ;  $p=0.030$ , respectively)

\* When the Bonferroni correction was made, the statistical significance disappeared for the difference between the groups.

**Table 4.** The effect of EE, PA, DP levels and number of shifts on PSQI: Multiple regression analysis

	B <sup>a</sup>	Std. Error	$\beta^b$	t	p
EE	0.169	0.029	0.324	5.745	<0.001
Number of shifts	0.181	0.046	0.174	3.958	<0.001
DP	0.009	0.050	0.010	0.176	0.860
PA	0.056	0.043	0.063	1.294	0.196

F(4,468)=17.421;  $p<.001$ ; Total Adjusted R2: 0.122; Adjusted R2 for DT: 0.095

B<sup>a</sup>: non-standardized regression coefficient;  $\beta^b$ : standardized regression coefficient; **EE**: Emotional burnout; **DP**: Depersonalization; **PA**: Personal accomplishment; **PSQI**: Pittsburgh Sleep Quality Index

and PA (Table 4).

When the groups separated according to who determined the number of appointments, himself, partially himself, and completely someone else, a significant difference was found between the groups in terms of all burnout level measurements and sleep quality (in all  $p < 0.001$ ). While the EE scores of those who determined their appointment number themselves were significantly lower than those who partially determined themselves and those who did not determine themselves ( $Z = -4.419$ ;  $p < 0.001$ ,  $Z = -9.363$ ;  $p < 0.001$ ), DT scores of those who partially determined their appointment number themselves their number was significantly lower than those who did not determine themselves ( $Z = -4.837$ ;  $p < 0.001$ ). DP scores of those who determined the number of appointments themselves were significantly lower than the other two groups ( $Z = 4.109$ ,  $p < 0.001$ ;  $Z = -8.885$ ,  $p < 0.001$ , respectively). DP scores of those who partially determined their number of appointments were significantly lower than those who did not determine their number of appointments ( $Z = -4.705$ ;  $p < 0.001$ ). PA scores of those who determined the number of appointments themselves were significantly higher than the other two groups ( $Z = 5.055$ ,  $p < 0.001$ ;  $Z = 8.061$ ,  $p < 0.001$ , respectively).

In terms of sleep quality, the PSQI score was significantly lower than the other groups in those who determined the number of appointments themselves ( $Z = -4.323$ ,  $p < 0.001$ ;  $Z = -6.210$ ,  $p < 0.001$ , respectively). The model, which included the inability of the physician to determine the number of appointments, exposure to violence, mobbing, and shift working, was analyzed by logistic regression analysis. There was a 2.6-fold increase in the risk of

poor sleep quality in physicians who could not set their own appointments. In addition, there was a 2.6-fold increase in the risk of poor sleep quality in physicians who were exposed to mobbing and a 1.9-fold increase in those who were exposed to violence (Table 5).

The difference between EE and PA scores was statistically significant according to the place of residence (district, province, metropolitan) ( $p = 0.044$ ,  $p = 0.012$ , respectively). EE scores of those living in the district were significantly higher than those living in the metropolitan city ( $Z = 2.405$ ;  $p = 0.049$ ) and PA scores were significantly lower ( $Z = -2.671$ ;  $p = 0.023$ ). Those living in the metropolitan area had higher median income ( $Z = 3.438$ ;  $p = 0.002$ ) and age ( $Z = 3.259$ ;  $p = 0.003$ ) than those living in the county. To whom the home of the physicians belonged also had a significant effect on EE, DP, PA levels ( $p < 0.001$ ). EE scores ( $Z = 4.620$ ;  $p < 0.001$ ,  $Z = 3.147$ ;  $p = 0.010$ ) and DP scores of the residents living in a rented house or that of a family member were statistically significantly higher than those who lived in their own home ( $Z = 5.722$ ;  $p < 0.001$ ,  $Z = 4.063$ ;  $p < 0.001$ ). PA scores were statistically significantly lower ( $Z = -4.891$ ;  $p < 0.001$ ,  $Z = -4.000$ ;  $p < 0.001$ ).

## DISCUSSION

In this study, the effect of working and living conditions of physicians on burnout and sleep quality was investigated. According to the findings obtained, working on night shifts / on-call shifts, a high number of patients who are cared for daily, short examination time, low income, being exposed to physical violence and mobbing, young age, female

**Table 5.** The fact that the physician could not determine the number of appointments, exposure to violence, thinking that he was exposed to mobbing, and the effect of shift working on the presence of sleep disorder: Logistic regression analysis

	B	Wald	Exp (B)	95 % CI for Exp(B)		<i>p</i>
				Lower	Upper	
Inability to determine the number of appointments	0.948	24.601	2.579	1.774	3.751	<0.001
Exposure to violence	0.964	16.074	2.622	1.637	4.201	<0.001
Exposure to mobbing	0.659	17.147	1.932	1.415	2.639	<0.001
Shift working	0.062	0.150	1.064	0.778	1.455	0.698



gender, increase in the number of children and living in the county, was associated with poor sleep quality and burnout in general. The cutoff values used for MBI dimensions in the literature show a high level of heterogeneity, and therefore, a healthy comparison in terms of frequency is not possible (21). At the same time, since the cutoff values were not determined in the Turkish form, it was necessary to consider average scores instead of burnout-related rates. Despite this, it is seen that burnout rates are reported in studies conducted in Turkey (22, 23). The mean values of burnout points in our study are compatible with other studies in Turkey (24, 25). In parallel with other studies conducted in Turkey (24, 25), the PA score was lower than the European average in the study conducted by Soler et al. (22). It is known that factors such as not being appreciated, being worthless, and having control over someone else play a role in PA (26, 27). In Turkey, the violence against physicians is high compared to other European countries. Also, other negative factors related to the health system may cause a decrease in the sense of PA (4, 28, 29).

Our study found that emotional burnout and depersonalization were higher in women, while perceived personal success was lower, in line with the majority of the literature (7, 22, 30–32). It is also possible that gender differences can be affected by cultural characteristics. As a matter of fact, in a large sample study, while burnout was more common in women in the United States ( $n=7868$ ), it was reported that it was seen more in men in another multicenter study ( $n=1393$ ) in which European countries were evaluated (22, 33). Purvanova et al. reported that EE is more common in women and DP in men in their study on the gender difference in burnout (34). In our research, it was seen that all burnout dimensions were affected by the female gender. Emphasis was placed on the importance of both occupational and psychosocial factors in these differences (32–34). It has been shown that challenging situations such as the number of children, conflict of home, and work demands cause more EE and decreased perception of PA (32, 33, 35, 36).

On the other hand, high burnout in women was found independent from the number of children, shifts, and marital status in our study. This may

be related to the study sample, where the number of children, the number of shifts, the rate of being married is higher in men. Therefore, the possible effects of these variables may not be demonstrated. Factors such as exposure to discrimination due to their gender, difficulty in academic promotion, exposure to more verbal violence, especially in surgical branches, are known to play a role in burnout (35, 36). In our study, it was found that women had higher rates of violence and mobbing. At the same time, it was observed that the EE and PA scores in the entire sample were independent of gender and mobbing, but that the high DP score in women was dependent on reporting that they experienced mobbing and violence. According to the findings of the study, it can be said that the relationship between EE score and female gender and age, DP score with age, violence and mobbing, and PA score with violence and female gender are more specific.

In previous studies, being single is shown as a risk factor for burnout (10, 22). In a study involving physicians working in the oncology department, all burnout dimensions of singles were higher (37). In our research, it was found that singles had higher DP scores and lower PA scores. At the same time, it was observed that the quality of sleep was worse in singles. In other studies, there are no data on how marital status affects burnout. In this study, it was found that the age, which was shown to be significantly associated with burnout, was lower, and the rate of the female sex was higher in singles. However, the effect of age on the marital status and burnout relationship could not be analyzed because these variables correlated low with burnout scores. At the same time, the fact that there was no difference in terms of EE, which is accepted as the main dimension of burnout, may be related to the fact that the number of patients examined daily showing the highest relationship with EE did not differ significantly between the two groups. EE mean score was found to be relatively high in both groups compared to other studies (22, 24, 30, 33).

In our study, the median professional duration and the median age of men were found to be higher. At the same time, shorter professional duration was shown to predict EE in women. Studies have suggested that the higher age of male physicians may

be a reason for determining relatively higher burnout levels for women (35). Because it is thought that young age is a risk factor for burnout in physicians (7, 33). Our study found that EE and DP levels decreased, and PA scores increased as the age increased in the entire sample. It has been shown that as the professional experience increases, the sense of control over the job and the ability to cope with professional problems are increased (38). This condition is associated with a reduction in burnout (7). However, studies also showed differences between burnout dimensions in relation to age. In a meta-analysis study of French physicians, it was found that as the professional duration increased, EE increased, DP decreased, and PA increased (39). In another meta-analysis, data from European countries were evaluated, no difference was found between PA and age (40). In a multicenter study in which family physicians working in 12 European countries were assessed, there was no relationship between DP and age, while EE and PA increased with increasing age (22). However, studies conducted in Turkey found similar results to our findings (24, 26, 41). It can be said that the literature information about the relationship between burnout level and age shows inconsistencies just like in gender, the working conditions, and the effect of the general health system are determinant.

One of the most challenging factors in terms of working conditions in physicians is prolonged working hours and night or on-call shifts. In our study, increased EE was found in those working with both the night shifts and on-call shifts compared to those working with on-call shifts or night shifts. On the other hand, no significant relationship was found between the number of shifts and EE. Studies have consistently reported that the number of shifts, working with the shift system, prolonged working hours, decreased sleep time are associated with burnout (42–44). In a study evaluating oncologists, pediatricians, and family physicians in Switzerland, it was found that working more than 50 hours a week predicted aspects of burnout (45). In our study, it was thought that the physicians who had night/on-call shifts had increased EE as a group effect, but the absence of this relationship with the number of them may be due to the recall bias of the participants or other uncontrolled factors. Work-

ing with the night/on-call shifts also appears as a risk in terms of depersonalization. In our study, it was revealed that working with night/on-call shifts was again associated with negative personal success perception independent of their number. Violence and mobbing, which the workers with night/on-call shifts are more exposed to, points to the low level of positive feedback received by people despite the intensive work pace. Although not evaluated in the study, it can be estimated that night/on-call shifts may also cause a restriction in the time that a person can devote to their professional skills, which may be associated with an increase in the sense of failure. As a matter of fact, the decrease in vocational training hours, social support, and autonomy was associated with a reduction in the sense of personal success (45). The relationship between night shifts and all burnout dimensions is known, but no study evaluating the on-call shifts and burnout relationship has been found in the literature. Considering that the time spent in the hospital due to on-call shifts is somehow prolonged, there may be a decrease in the quality time allocated to rest, and that the person may be in anticipation of work outside of working hours, may cause emotional wear and tear of the spiritual energy that he invests in his profession.

It was observed that the number of shifts and emotional burnout had a significant effect in explaining the quality of sleep. It is known that burnout and insomnia are a mutual interaction (17, 43). With increased stress, sleep quality deteriorates, and in a chronic ineffective sleep state, the risk of depression and burnout increases (17). In a study, a relationship between EE and sleep quality, especially in terms of burnout was found (43). On the other hand, the fact that the total score of PSQI has a significant relationship with the number of shifts and EE, but the absence of this relationship between the number of shifts and EE may indicate that the increased number of shifts disrupts sleep quality and causes emotional exhaustion. Sonnenschein et al. found that people with burnout syndrome predicted prolonged return to work, regardless of depressive mood (46). At the same time, the risk of deterioration in sleep quality was found to be 2.6 times higher in those who stated that they were exposed to mobbing in our study. Seventy-four percent of the participants

indicated that they were exposed to mobbing. Although this high rate does not directly reflect being subjected to mobbing, it provides indirect data by showing that the thoughts of pressure and wear perceived by the people are frequent. In a study conducted in Turkey, the rate of mobbing in residents of internal medical sciences and surgical sciences was found higher than residents of basic medical sciences (24). In accordance with our findings, mobbing has been shown to be associated with an increase in EE and DP levels and a decrease in PA in the same study. In our study, however, no difference was found between the branches in terms of reporting violence or mobbing.

In our study, a 2.6-fold increase was found in the risk of deterioration in sleep quality of physicians who could not determine their appointments themselves. It was observed that physicians who could not determine the number of patients examined more patients in a shorter time. These factors that point to intense working conditions, have been associated with poor sleep quality and worsening in all aspects of burnout.

It is believed that the intensity of working conditions differs among branches of specialists due to the situations discussed above. In our study, there was only a difference between EE levels in terms of burnout. This difference was due to physicians working in basic medical sciences where emotional burnout was lower than in other departments. In a study conducted in Turkey, it was found that residents working in surgical and internal medical sciences showed more burnout in terms of EE, DP, and PA compared to residents working in basic medical sciences (24). In another study, EE scores were found to be higher in residents of internal medical sciences than surgical sciences. It is expected that burnout is high in the branches directly facing the patient. However, the reason for the absence of differences between internal/surgical medical sciences and general practitioners may be due to the lack of difference in terms of duration of the examination, who determined the number of appointments, exposure to violence, or mobbing. It may also be due to the internal dynamics of the departments that cannot be measured in the study, which may affect burnout.

In studies conducted in Turkey, burnout levels were found to be low in academicians consistently (26, 47, 48). In a study conducted with physicians, it was found that specialists had lower levels of EE and DP compared to residents and academicians (47). In our study, similar to the results of other studies, it was found that academicians showed less burnout in all dimensions compared to specialists, residents, and general practitioners. On the other hand, PA score was different in all groups, with an increase from general practitioners to academicians. Additionally, in line with literature DP scores of residents was found higher than specialists and academicians. There are expected findings that the ability to cope with professional problems and sense of competence will gradually increase with the time spent and training received in the profession.

In our study, the EE scores of those living in the county were higher than those living in the metropolitan area, and the PA scores were low. It may be thought that physicians working in the county are emotionally exhausted and have less sense of success due to possible reasons such as having more socially limited opportunities, more difficult access to opportunities such as vocational education, limited equipment, absence of teamwork. Studies have reported that burnout is higher in physicians working in cities or large hospitals; living in a more complex social environment can lead to burnout associated with difficulties caused by increased levels of expectation in patients and a decrease in the sense of control (49, 50).

In studies conducted, EE and DP were found higher, and PA was found lower in those who did not want to be a physician (41, 47). In our study, it was found that wanting to be a physician had a specific relationship with PA, independent of other dimensions of burnout. It can be thought that choosing the profession intended is a factor that enables struggling with the demand and less exhaustion in the face of professional difficulties. It may also provide an increase in the sense of personal success as a driving force in taking steps to increase the person's sense of success. Contrary to other studies that evaluated 'choosing to be a physician willingly' as a category, we considered it from a dimensional perspective because of the nature of wanting. The difference

in our findings may be due to this situation. In our study, when all the participants were evaluated, the rate of poor sleep quality was 72.4%. The proportion of those with poor sleep quality was 67.2% in those working during the day shift and 74.6% in those working at night shifts. Working at night can be an essential factor in disrupting sleep quality. Tür et al. (2015) reported poor sleep quality in 83% of physicians working night shifts (51). In another study, 83.8% of emergency physicians and 50.7% of family physicians reported poor sleep quality (52). In another study, the rate of poor sleep quality in physicians with functional gastrointestinal disorders was 89.6%, while it was 66.4% in those without functional gastrointestinal disorders (53). In the study of Surani et al. (2015), the rate of poor sleep quality among house officer doctors was 36.8% (54). Working in the hospital can be a factor in disrupting sleep quality. In general, it can be said that physicians have a high rate of impaired sleep quality. However, there are also studies in physicians that find poor sleep quality to be low. Differences in rates may vary depending on the region and the characteristics of the participants in the working group.

Our study has some limitations. First of all, it is not possible to show the cause-effect relationship since the study is cross-sectional. Secondly, the study is a questionnaire study, and it was not possible to check the recall bias related to the working conditions. Since it is a questionnaire study, the sleep quality of the participants was evaluated with PSQI alone. Other than verbal reporting, biological parameters that would more objectively show sleep quality could not be applied to the participants. Thirdly, the fact that some specializations were low in the sample prevented further analysis. Specialization branches are handled in general titles, and department-specific examinations could not be done due to sample limitation. Fourthly, personality traits that affect burnout levels have not been studied, as they can significantly increase the length of the questionnaire and decrease the response rate. Fifth, the respondents were asked whether they had been subjected to violence, but not how many times they had been exposed to violence. For this reason, a correlational evaluation could not be made between the number of being exposed to violence and the lev-

el of burnout and sleep disturbance. Finally, a randomization method was not used in the selection of the study sample. Among the people invited online, those who volunteered to fill out the questionnaire constituted the study sample. Although the sample of our study is relatively large, as in other self-report online survey studies, the results should be evaluated carefully in order to be generalized to all clinicians.

## CONCLUSIONS

Burnout in physicians is two times higher than in other professions (10). The effects of burnout in physicians are important not only because of their well-being but also because of their reflection on the service and health system they provide. Short interventions are not effective for preventing burnout. Therefore, long intervention plans are planned to prevent burnout. Burnout can be reduced by interventions such as the number of patients examined daily and the duration of patient examinations, the physician's ability to determine working hours, and the number of shifts. These factors, which are thought to cause burnout and violence may also play a role in the deterioration of sleep quality. Impaired sleep quality is thought to predict increased EE more specifically than other dimensions. It is thought that examining each burnout dimension with different groups and other large sample studies is important in early intervention and prevention of burnout. Our study is the first research that examines the burnout level and sleep quality in a large population in Turkey.

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