



Assessment of Working Conditions and Job Satisfaction of Neurology Specialists

Nöroloji Uzmanlarının Çalışma Koşullarının ve İş Memnuniyetlerinin Değerlendirilmesi

● Ahmet Onur Keskin¹, ● Aslı Şentürk², ● Ali Özhan Sıvacı³, ● Murat Çalık⁴, ● Bahar Erbaş⁵, ● Eylem Gül Ateş⁶, ● Mehmet Akif Topçuoğlu⁷

¹Baskent University Faculty of Medicine, Adana Dr. Turgut Noyan Practice and Research Hospital, Department of Neurology, Adana, Türkiye

²Istanbul Yeni Yüzyıl University Faculty of Medicine, Department of Neurology, Istanbul, Türkiye

³Bursa Yüksek İhtisas Training and Research Hospital, Clinic of Neurology, Bursa, Türkiye

⁴Samsun Training and Research Hospital, Clinic of Neurology, Samsun, Türkiye

⁵Demiroğlu Bilim University Faculty of Medicine, Department of Neurology, Istanbul, Türkiye

⁶Baskent University Faculty of Medicine, Department of Biostatistics, Ankara, Türkiye

⁷Hacettepe University Faculty of Medicine, Department of Neurology, Ankara, Türkiye

Abstract

Objective: This study aimed to examine the demographic characteristics and working conditions of neurology specialists working in Türkiye and to determine the factors that play a role in neurologists' resignations.

Materials and Methods: This study was designed as a multiple-choice survey. The study included 472 neurology specialists who were actively practicing in clinics. The data collected through the questionnaire were analyzed.

Results: Most (78.2%) of neurologist work in public hospitals, while 15.7% work in private hospitals, 3.6% work in foundation hospitals, and 2.5% work in private practices. 70.1% of the participants examine 41 or more patients per day. 37.7% of neurologists take on-call duty for ten or more days per month. 93.8% think their payment is not at a deserved level. 70% of the participants (n = 328) reported experiencing verbal violence. The rate of those who reported being exposed to mobbing is 62.5% (n = 295). 56% of the participants (n = 264) frequently feel burned out or depressed. Only 10% of them are satisfied with their working conditions. We used Logistic regression analysis to investigate factors for resigning. Accordingly, exposure to verbal or physical violence ($P = 0.033$), working in a particular institution ($P = 0.038$), and the number of emergency shifts affect the likelihood of resignation ($P = 0.046$). The probability of resigning for lecturers is significantly lower (OR: 0.05). The likelihood of resigning for those who report earning less than what they deserve is about 16 times higher than those who feel they are adequately paid.

Conclusion: The workload of neurology specialists is high. Neurologists have a high rate of exposure to violence and low job satisfaction. The workload of physicians varies significantly across different units and regions and is unequally distributed. To increase job satisfaction among healthcare workers and prevent physician migration, there is a need to improve working conditions, distribute workload and resources more equally among units.

Keywords: Neurologist, violence, resignation, job satisfaction, workload

Address for Correspondence/Yazışma Adresi: Lec, Ahmet Onur Keskin, MD, Baskent University Faculty of Medicine, Adana Dr. Turgut Noyan Practice and Research Hospital, Department of Neurology, Adana, Türkiye

Phone: +90 322 344 44 44 E-mail: aonurkeskin@gmail.com ORCID: orcid.org/0000-0002-2942-323X

Received/Geliş Tarihi: 06.03.2023 **Accepted/Kabul Tarihi:** 17.05.2023



©Copyright 2023 by the Turkish Neurological Society / Turkish Journal of Neurology published by Galenos Publishing House.
Licensed by Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND) International License.

Öz

Amaç: Çalışmamızda Türkiye’de çalışan nöroloji uzmanlarının demografik özelliklerini ve çalışma koşullarını incelemeyi, nörologların istifa etmesinde rol oynayan faktörleri belirlemeyi amaçladık.

Gereç ve Yöntem: Bu çalışma çoktan seçmeli anket çalışması olarak planlanmıştır. Araştırmaya dahil olma kriteri; nöroloji uzmanı olarak aktif klinik pratik yapmaya devam ediyor olmak olarak belirlenmiştir. Dört yüz yetmiş iki nöroloji uzmanı çalışmaya katılmış, elde edilen veriler istatistik yöntemleri ile değerlendirilmiştir.

Bulgular: Katılımcıların ortalama yaşı 43 ± 8 ’dir. Nöroloji uzmanlarının %78,2’si kamu hastanelerinde, %15,7’si özel hastanelerde, %3,6’sı vakıf hastanelerinde ve %2,5’i muayenehanelerde çalışmaktadır. Çalışmamıza katılan nörologların %70,1’i günde 41 veya daha fazla hasta bakmaktadır. Nörologların %37,7’si (n = 172) ayda on gün veya daha fazla icap nöbeti tutmaktadır. %93,8’i ücretinin hak ettiği düzeyde olmadığını düşünmektedir. Katılımcılardan %70’i (n = 328) sözel şiddete maruz kaldığını, ikisi ise sözel şiddet yanında fiziksel şiddete maruz kaldığını bildirmiştir. Mobbinge maruz kaldığını bildirenlerin oranı %62,5’tir (n = 295). Katılımcıların %56’sı (n = 264) kendisini sıklıkla tükenmiş veya depresif hissetmektedir. Çalışma koşullarından %10’u memnundur. İstifa üzerine etkili faktörler logistik regresyon analizi ile incelenmiştir. Buna göre; sözel ya da fiziksel şiddete maruz kalmak ($P = 0,033$), çalışılan kurum ($P = 0,038$) ve icap nöbeti sayısı istifa üzerinde etkilidir ($P = 0,046$). Öğretim görevlisi olanlarda istifa etme olasılığı, öğretim görevlisi olmayanlara göre anlamlı olarak düşüktür (Odds oranı: 0,05). Aylık kazancının hak ettiği düzeyden az olduğunu bildirenlerin istifa etme olasılığı, hak ettiğini düşünenlere göre yaklaşık 16 kat daha fazladır.

Sonuç: Nöroloji uzmanlarının iş yükleri fazladır. Nörologların sağlıkta şiddete maruz kalma oranı yüksektir ve iş memnuniyeti azdır. Nörologların iş yükü çalışılan birime ve bölgelere farklılık göstermekte ve iş yükü eşitsiz dağılmaktadır. Özellikle genç uzman hekimlerin ve kamu sektöründe çalışan nörologların istifa etme niyeti daha fazladır. Sağlıkta çalışan memnuniyetini artırmak ve hekim göçünü engellemek için çalışma koşullarının iyileştirilmesine, çalışma birimleri arasında iş yükü ve olanakların daha eşit dağılmasına ihtiyaç vardır.

Anahtar Kelimeler: Nöroloji uzmanı, sağlıkta şiddet, istifa, iş memnuniyeti, iş yükü

Introduction

Physician resignations and the number of physicians who leave Türkiye to go abroad to work have increased recently. Studies examining the reasons for these resignations have reported that the rate of resignation is relatively high for physicians who are called to the hospital in emergencies and whose working conditions are more stressful (1,2). Neurology specialists working in hospitals may be more prone to resignation due to their high workload during working hours and the fact that they undertake additional duties outside normal working hours, such as shifts and required hours of work. With the coronavirus disease-2019 (COVID-19) pandemic, the workload of physicians has increased and working conditions have worsened in many countries, and burnout and neuropsychiatric disorders have increased in healthcare workers (3,4). During the pandemic, most of the neurology specialists in Türkiye were assigned to outpatient clinics, services, and intensive care units that supported patients with COVID-19, rather than to neurology units.

No previous study has evaluated in detail the working conditions of neurology specialists in Türkiye. Conducting such a study and investigating the burnout they experience is crucial for understanding the workload of specialist physicians in Türkiye and the factors associated with their resignation. This study aimed to evaluate the working conditions of neurologists and examine the factors that may cause them to leave their jobs.

Materials and Methods

This study was planned as a multiple-choice survey study. The questionnaire consisted of 39 questions (Annex-1). The criterion for inclusion in the research was continuing active clinical practice as a neurologist. Participants were informed about the study, and their names and e-mail addresses were collected and recorded so that no individual would participate in the survey study twice. Neurology specialists participating in the study were asked to sign an informed consent form. The data obtained from the study were evaluated using statistical methods, and the relationships

between demographic data, working conditions, job satisfaction, and resignation behavior were investigated.

Statistical Analysis

The IBM SPSS Statistics for Windows software, version 25.0 (IBM Corp., 2012, Armonk, NY, USA) was used for statistical analysis. As descriptive statistics, categorical data were presented as numbers and percentages, and quantitative data were presented as median (minimum-maximum). The Shapiro-Wilk and Kolmogorov-Smirnov tests were used to test the normality assumption. The chi-square test and Fisher’s exact test were used when necessary to compare categorical variables in independent groups. The Kruskal-Wallis test was applied to compare more than two independent groups of continuous data that did not show normal distribution, and when a significant difference was detected between the groups, the Bonferroni post-hoc test was used to determine which group pairs differed from each other. In the univariate analyses for resignation, all variables with $P < 0.20$ were included in the multiple logistic regression model, and these variables were analyzed using backward stepwise variable selection methods. A value of $P < 0.05$ was considered statistically significant.

Results

A total of 472 neurologists, consisting of 334 women (70.7%) and 138 men (29.3%), with a median age of 41 (25-75) years, were included in the study. Geographically, the neurologists resided in the Marmara Region (40.7%), Aegean Region (15.7%), Central Anatolia Region (15.3%), Mediterranean Region (12.7%), Black Sea Region (7.2%), Southeastern Anatolia Region (4.7%), and Eastern Anatolia Region (3.8%). The neurologists were mostly employed in public hospitals (78.2%) (Table 1). Among the participants, 46.8% (n = 221) had been working as neurologists for 1-10 years, 33.9% (n = 160) for 11-20 years, 14.8% (n = 70) for 21-30 years, and 4.4% (n = 21) for more than 30 years.

Although 14% (n = 66) of the neurologists worked alone in their unit, 15% (n = 71) were working with one other

neurologist. In total, 19.2% (n = 90) examined 1-20 patients per day, 10.7% (n = 50) 21-40 patients per day, 33.1% (n = 155) 41-60 patients per day, 28% (n = 131) 61-80 patients per day, 7.4% (n = 35) 81-100 patients per day, and 1.5% (n = 7) more than 100 patients per day. Although 37.7% (n = 172) of the neurologists had 10 or more days of on-call duties per month, 16.6% (n = 78) had five or more “branch” night shifts per month, meaning that after a 24-hour shift, 65.7% of them continued to work. In November 2021, when the survey was conducted, 10% of them had a monthly income of less than \$1,000, 60% had an income of \$1,000-\$1,500, and 9% had an income of more than \$2,000, with 93.8% believing that their wages were below the level they deserved. When asked how frequently they felt exhausted or depressed, 56% (n =

264) replied “often” and 38% (n = 179) replied “sometimes”. In addition, 62.5% reported that they were exposed to mobbing at least once in their institution. In total, 70% of the neurologists (n = 328) reported that they were exposed to verbal violence, and two neurologists stated that they were exposed to physical violence as well as verbal violence. The number of neurologists who reported that they were satisfied with their working conditions was 47 (10%), but the majority reported that they were either not satisfied (n = 200, 42.6%) or sometimes dissatisfied (n = 107, 22.8%). The rate of those who had thought about resigning or changing their job in the previous year was 83.3%, with 27.5% wanting to work in a different line of business by changing sectors. Moreover, 60% stated that they would not choose to study at medical school

Table 1. Demographic and institution-related characteristics

	n	%
Gender		
Male	138	70.8
Female	334	29.2
What is the geographical region of the city you work in?		
Marmara Region	192	40.7
Aegean Region	74	15.7
Central Anatolia Region	72	15.3
Mediterranean Region	60	12.7
Black Sea Region	34	7.2
Southeastern Anatolia Region	22	4.7
Eastern Anatolia Region	18	3.8
What type of institution do you work in?		
Public hospital	369	78.2
Private hospital	74	15.7
Foundation hospital	17	3.6
Private practice	12	2.5
How many years have you been working as a neurologist?		
1-10 years	221	46.8
11-20 years	160	33.9
21-30 years	70	14.8
>30 years	21	4.4
Which level of healthcare institution do you work in?		
3 rd level	273	57.8
2 nd level	187	39.6
Private practice	12	2.5
How many patients do you examine on average per day in the outpatient clinic?		
1-20 patients	90	19.2
21-40 patients	50	10.7
41-60 patients	155	33.1
61-80 patients	131	28.0
81-100 patients	35	7.5
>100 patients	7	1.5

if they graduated from high school today, and 48.5% thought that no official institution or association could help them with judicial or administrative problems related to their work.

The gender-based evaluations determined that female neurologists resided mainly in the Marmara Region and in the west of the country, whereas the percentage of male neurologists residing in the East and Southeast Regions (7.2% and 6.5%, respectively) was significantly higher than that of female neurologists (2.1% and 3.9%, respectively) ($P = 0.019$). Female neurologists ($n = 222$, 67.1%) reported that they were more exposed to mobbing than male neurologists ($n = 70$, 51.1%) ($P = 0.004$). The income levels of neurologists differed by gender, with men earning more ($P < 0.001$). The rate of male neurologists earning over \$2,000 per month was 15.1%, but this rate was just 6% for female neurologists. Again, among female neurologists, 12.3% had an income of less than \$1,000, whereas this rate was 5.1% for male neurologists.

In comparisons made by age, the median age of neurologists who had thought about resigning or changing their job in the previous year was 40 (25-75) years, which was found to be significantly lower than that of neurologists who did not plan to change jobs or resign (median age 44; 31-67 years) ($P < 0.001$). The median age of neurologists who reported that they were exposed to violence (40; 25-67 years) was found to be lower than that of neurologists who reported that they were not exposed to violence (43; 29-75 years) ($P < 0.001$). In addition, dissatisfaction with working conditions ($P = 0.01$) and feeling

burnt out ($P = 0.002$) were also higher among relatively young neurologists.

The rate of being exposed to violence and feeling burnt out differed according to the institution ($P < 0.001$). Of the neurologists who said they often felt exhausted or depressed, 62.8% ($n = 125$) worked in a public hospital, 37.8% ($n = 28$) in a private hospital, and 29.4% ($n = 5$) in a foundation hospital. Although the percentage of neurologists exposed to violence was highest in public hospitals at 78.3% ($n = 82$), 16.7% ($n = 2$) of those working in private practice were also exposed to violence. The number of patients examined in the outpatient clinic differed between institutions ($P < 0.0001$). The percentage of neurologists who cared for 40 or fewer patients in public hospitals was 11.4% ($n = 42$), with 75.3% ($n = 55$) of neurologists working in private hospitals performing 20 or fewer outpatient clinic examinations per day. Among the neurologists working in private practice, none performed more than 20 outpatient examinations a day. Although 40.5% ($n = 134$) of neurologists in public hospitals could take leave after night shifts, only 3.2% of those in private hospitals could do this.

The opinions of experts working in different institutions on how long the outpatient clinic examination should be were significantly different ($P < 0.001$). Although 58.5% ($n = 10$) of the neurologists working in foundation hospitals thought that the examination time should be 20 minutes or more, only 10.2% ($n = 37$) of those working in public hospitals agreed.

Table 2. Factors related to the resignation of neurologists

	OR (95% CI)	P
Constant		0.038*
In what type of institution do you work? (ref: public hospital)		0.038*
Private hospital	0.18 (0.03-1.10)	0.064
Foundation hospital	4.60 (0.42-50.47)	0.212
If the institution you work for is a "training hospital", do you have any assignment in this regard? (ref: I'm not a lecturer)	0.06 (0.01-0.33)	0.002*
Have you been exposed to verbal or physical violence in the last year? (ref: no, I haven't)		0.033*
Yes, I have been subjected to verbal violence	NA	1.000
Yes, I have been subjected to physical violence	6.079 (1.57-23.62)	0.009*
If yes, how many days per month do you have night shifts? (ref: 1-3 days)		0.046*
1 week	0.26 (0.04-1.85)	0.177
10 days	2.79 (0.22-34.91)	0.427
15 days	31.37 (1.41-695.93)	0.029*
All month long	1.13 (0.10-12.69)	0.919
In your opinion, how many minutes should be allocated for a patient presenting with neurological complaints or being followed up with a neurological diagnosis in an outpatient clinic on average? (ref: 1-5 minutes)		0.040*
6-10 minutes	1.02 (0.02-46.24)	0.991
11-15 minutes	32.70 (2.20-485.71)	0.011
11-15 minutes	13.79 (1.06-179.69)	0.045*
21-30 minutes	2.89 (0.2-41.83)	0.437
Do you think your monthly income is at the level you deserve? (ref: yes)	16.07 (1.73-149.08)	0.015*

*: $P < 0.05$, NA: Not available, Cox & Snell R Square: 0.314, Nagelkerke R square: 0.550, OR: Odds ratio, CI: Confidence interval

In terms of monthly income, there was a significant difference among neurologists according to the type of institution ($P < 0.0001$). The percentage of specialists with an income of less than \$2,000 was 96.4% for those in public hospitals, whereas it was 70.3% and 63.6% for neurologists working in private hospitals and private practice, respectively. The percentages of neurologists considering changing jobs or institutions within the previous year differed between institutions ($P < 0.0001$): 89.6% ($n = 366$) for neurologists working in public hospitals, 66.2% ($n = 74$) in private hospitals, 70.6% ($n = 17$) in foundation hospitals, and 8.3% in private practice.

The evaluations based on geographical region identified a significant difference in terms of the number of outpatient clinic examinations ($P < 0.001$). Although 83.4% of the neurologists in the Eastern Anatolia region examined 60 or more patients a day, the average rate in Türkiye was 40.9%. Neurologists' monthly incomes were different according to geographical regions, with the highest incomes in the Eastern Anatolia region ($P < 0.001$).

The percentage of neurologists who reported that they were exposed to mobbing was found to be higher for those working in a training hospital ($P = 0.01$).

The factors affecting resignation, which were evaluated using logistic regression analysis, were the following: exposure to verbal or physical violence ($P = 0.033$); the institution where the neurologists worked ($P = 0.038$); not being a lecturer ($P = 0.002$); the number of on-call duties ($P = 0.046$); whether the monthly income was at the deserved level ($P = 0.015$). Those who were exposed to physical violence were 6.08 times more likely to resign than those who were not [95% confidence interval (CI): 1.565-23.619]. The probability of resignation among lecturers was significantly lower than that among non-lecturers [Odds ratio (OR): 0.05, 95% CI: 0.009-0.332]. Those who had 15 days of on-call duties per month were more likely to resign than those who had just 1-3 days. Those who reported that their monthly income was less than they deserved were approximately 16 times more likely to resign than those who thought that their monthly income was at the level they deserved (Table 2).

Discussion

Demographic data obtained in our study revealed that the participants were selected appropriately to represent neurologists working in Türkiye. Most were women working in the public sector. In Türkiye, the distribution of neurologists according to geographical regions is unequal. More neurologists work in the west of the country, which is consistent with the high population there. Moreover, most work in metropolitan cities and training hospitals, which might be associated with the increase in the population in metropolitan cities as well as the increase in the need for neurologists who can provide 24-hour emergency services in third-level hospitals with stroke centers.

The workload of physicians and healthcare workers in Türkiye is high (5,6). A study examining the working conditions of 524 orthopedic residents in Türkiye reported that 64% of the participants worked more than 90 hours a week (5).

Similarly, our study revealed that the workload of neurologists was heavy. In total, 70.1% cared for 41 or more patients per day, and the amount of out-of-hours work and on-call duty was also high. Violence against healthcare workers is common in Türkiye (6,7,8,9). In a study conducted in Kirikkale, where 120 health

personnel working in ambulances were evaluated in terms of burnout and exposure to violence, it was reported that 67.5% of the participants were exposed to verbal or physical violence, and more male health personnel were exposed to physical violence than female health personnel (7). There has been a striking increase in the number of reported incidents over the years since the introduction of the white code system in 2012, in which the health personnel of the Ministry of Health of the Republic of Türkiye report violence in the healthcare sector. The 7,751 incidents reported in 2017 increased tenfold in 2020, reaching 72,158 (8). Violence is also a serious problem for neurologists. In our study, 70% ($n = 328$) of the participants reported that they were exposed to verbal violence, with two neurologists reporting that they were also exposed to physical violence.

The annual income of 29.7% of orthopedic residents in Türkiye was reported as being less than \$17,700, and 69% of the participants experienced financial difficulties (5). The annual income of neurologists in Türkiye is significantly lower than that of neurologists working in the United States, where the annual income of a neurologist was reported in 2021 as being \$280,000 (10). Even after the increase in physician wages in Türkiye under the 2022 "Beyaz Reform," the annual income of neurologists remains less than that of neurologists in other OECD countries. According to the Turkish Medical Association, the purchasing power of physicians in Türkiye has decreased significantly in the last 20 years (8).

Güler et al. (11) investigated burnout in all health workers ($n = 232$) at Alanya Alaaddin Keykubat University, reporting that 77.8% of the workers had the condition. Similarly, in our study, the majority of neurologists stated that they felt exhausted and depressed. The intensive workload was thought to be one of the reasons for the emergence of burnout.

Forty-one physicians were included in a study examining the reasons for the resignation of emergency-medicine resident workers in Türkiye. The resident physicians reported violence/safety concerns (63.4%), intense working conditions (53.7%), and mobbing (26.8%) as the most common reasons for resignation (6). In a study examining the reasons for the resignation of resident orthopedic practitioners, it was reported that the most common reasons for resignation were heavy workload ($n = 45$, 72.6%) and long working hours ($n = 45$, 72.6%) (12). In a study performed on 440 physicians and primary care workers in China, low income (73.7%), high job risk (39.3%), job stress (37.2%), and improved career prospects (32.1%) were defined as factors associated with resignation (13). Similarly, in our study, the probability of resignation was high among neurologists who thought that they received an income less than they deserved, and the risk was 16 times higher than for those who did not. Bonenberger et al. (14) investigated factors associated with an intention to resign in 256 healthcare workers in Ghana and identified that workload (OR: 0.58, 95% CI: 0.34-0.99), career advancement (OR: 0.56, 95% CI: 0.36-0.86), organizational commitment (OR: 0.36, 95% CI: 0.19-0.66), and burnout (OR: 0.59, 95% CI: 0.39-0.91) played a part. In our study, it was determined that the professional satisfaction of neurologists was quite low. Being exposed to violence, working in a public hospital, having a high number of on-call duties, and earning a monthly income lower than they felt they deserved were put forward as factors directly related to their resignation. In

Türkiye, unlike other countries, violence in healthcare is clearly a significant reason for resignation.

A key problem in the healthcare sector in Türkiye in recent years has been the migration of physicians abroad. In 2012, the number of physicians who were admitted to the Turkish Medical Association to work abroad and received a certificate of good conduct was 59; in 2022, 1,402 physicians had left Türkiye to work in other countries by August of that year (8). In two separate studies examining physician migration in Ireland, it was reported that a heavy workload, long working hours, an unfavorable work environment, and inadequate career opportunities increased physician migration abroad (15,16). Similarly, it has been reported that doctors in Germany have longer working hours than those in Switzerland and the low labor-to-earnings ratio attracts doctors to work in Switzerland (17). According to our study, heavy workloads, a low effort-reward ratio, and frequent violence in healthcare were associated with resignations. In addition, young neurologists were found to be more dissatisfied with their working conditions, prompting resignations and a desire to work abroad. The increase in Türkiye in physician resignations and migration abroad has accelerated over the years, making improvements in working conditions for physicians a necessity.

Conclusion

The workload of neurologists in our study was high. They had increased exposure to violence and low job satisfaction. The workload of physicians differed significantly between the institutions and regions where they worked and was unequally distributed. In particular, young specialist physicians and neurologists working in the public sector were more likely to resign. In our study, the most important factors associated with the decision to resign were found to be insufficient wages, violence, and intense working conditions.

In recent years, the migration of physicians from Türkiye has increased. In 2022, a series of legal regulations and wage improvements in the country were made under the “Beyaz Reform”, which aims to improve the working conditions of physicians. In addition, there is a need to improve working conditions and distribute the workload and opportunities more evenly among institutions to increase employee satisfaction in healthcare and prevent resignations and physician migration.

Ethics

Ethics Committee Approval: Baskent University Ethics Committee (no: E-94603339-604.01.02-146034, no: KA22/334).

Informed Consent: Neurology specialists participating in the study were asked to sign an informed consent form.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: A.O.K., A.Ş., M.A.T., Design: A.O.K., A.Ö.S., Data Collection or Processing: A.O.K., A.Ş., A.Ö.S., M.Ç., Analysis

or Interpretation: A.O.K., A.Ö.S., M.Ç., B.E., E.G.A., M.A.T., Literature Search: A.O.K., A.Ş., A.Ö.S., B.E., E.G.A., Writing: A.O.K., B.E., E.G.A.

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

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

References

1. Heponiemi T, Presseau J, Elovainio M. On-call work and physicians' turnover intention: the moderating effect of job strain. *Psychol Health Med* 2016;21:74-80.
2. Lu Y, Hu XM, Huang XL, et al. The relationship between job satisfaction, work stress, work-family conflict, and turnover intention among physicians in Guangdong, China: a cross-sectional study. *BMJ Open* 2017;7:e014894.
3. Barello S, Palamenghi L, Graffigna G. Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. *Psychiatry Res* 2020;290:113129.
4. Song X, Fu W, Liu X, et al. Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China. *Brain Behav Immun* 2020;88:60-65.
5. Güleç B, Yalçın S, Sürücü S, et al. Orthopedics and traumatology residency - working conditions, training, and psychological stress. *Acta Chir Orthop Traumatol Cech* 2019;86:281-285.
6. Cerin M, Bicakci S, Canakci ME, Aydin MO, Bayram B. A Critical appraisal of emergency medicine specialty training and resignation among residents in emergency medicine in Turkey. *Emerg Med Int* 2019;2019:6197618.
7. Deniz T, Saygun M, Eroğlu O, Ülger H, Azapoğlu B. Effect of exposure to violence on the development of burnoutsyndrome in ambulance staff. *Turk J Med Sci* 2016;46:296-302.
8. Genc K. Turkish doctors emigrate amid low pay and rising violence. *Lancet* 2022;400:482-483.
9. Beyazadam D, Kaya F, Taşdemir İM, Alimoğlu O. Analysis of physical violence incidents against physicians in Turkey between 2008 and 2018. *Ulus Travma Acil Cerrahi Derg* 2022;28:641-647.
10. <https://www.medscape.com/slideshow/2021-compensation-neurologist-6013853#2>
11. Güler Y, Şengül S, Çaliş H, Karabulut Z. Burnout syndrome should not be underestimated. *Rev Assoc Med Bras* (1992). 2019;65:1356-1360.
12. Mert L, Demirel M, Kendirci AŞ, Akgül T, Kılıçoğlu Öİ. Reasons for resident resignations from Orthopedic Residency Programs in Turkey: A cross-sectional survey from residents' perspectives. *Acta Orthop Traumatol Turc* 2022;56:222-227.
13. Wen T, Zhang Y, Wang X, Tang G. Factors influencing turnover intention among primary care doctors: a cross-sectional study in Chongqing, China. *Hum Resour Health* 2018;16:10.
14. Bonenberger M, Aikins M, Akweongo P, Wyss K. The effects of health worker motivation and job satisfaction on turnover intention in Ghana: a cross-sectional study. *Hum Resour Health* 2014;12:43.
15. Humphries N, McDermott AM, Conway E, et al. 'Everything was just getting worse and worse': deteriorating job quality as a driver of doctor emigration from Ireland. *Hum Resour Health* 2019;17:97.
16. Humphries N, Crowe S, McDermott C, McAleese S, Brugha R. The consequences of Ireland's culture of medical migration. *Hum Resour Health* 2017;15:87.
17. Ohlander J, Weigl M, Petru R, Angerer P, Radon K. Working conditions and effort-reward imbalance of German physicians in Sweden respective Germany: a comparative study. *Int Arch Occup Environ Health* 2015;88:511-519.

Annex 1. Survey questions

1. How many years have you been working as a neurologist?

- a. 1-10
- b. 11-20
- c. 21-30
- d. 31 or higher

2. How old are you?

.....

3. What is your gender?

- a. Female
- b. Male

4. Which institution do you work for?

- a. Public hospital
- b. Private hospital
- c. Foundation hospital
- d. Private practice

5. What is the administrative unit of the city where the hospital you work in is located?

- a. District
- b. Province
- c. Metropolitan

6. What is the geographical region of the province you work in?

- a. Marmara
- b. Aegean
- c. Mediterranean
- d. Black Sea
- e. Southeastern Anatolia
- f. Central Anatolia
- g. Eastern Anatolia

7. What is the level of the hospital where you work?

- a. 2nd level
- b. 3rd level

8. Is your institution a training hospital?

- a. Yes
- b. No

9. How many physicians work with you in your unit?

- a. 1
- b. 2
- c. 3-5
- d. 6 or more

10. If the institution you work for is a training hospital, what is your assignment?

- a. I am a lecturer
- b. I am not a lecturer

11. Are you satisfied with your working conditions?

- a. Yes, I am
- b. No, I am not

12. Do you have difficulties due to drugs that you cannot prescribe or have no reimbursement although they have a neurological medical indication?

- a. No
- b. Yes, rarely
- c. Yes, oftenly

13. Do you think that the neurology clinic/discipline is given enough importance in your institution and has a say in the multidisciplinary approach?

- a. Yes
- b. No

14. Do you feel exhausted or depressed?

- a. Yes, sometimes
- b. Yes, oftenly
- c. No

15. Have you been exposed to mobbing in your institution?

- a. No
- b. Yes, rarely
- c. Yes, oftenly

16. Have you been exposed to verbal or physical violence in the last 1 year?

- a. No, I haven't
- b. Yes, I have been subjected to verbal violence
- c. Yes, I have been subjected to physical violence
- d. Yes, I have been subjected to verbal and physical violence

17. Which of the following branches are there in the unit you work?

- a. Neurosurgery
- b. Cardiology
- c. Cardiovascular surgery
- d. Radiology

18. Is there a radiology specialist (officially assigned) in your hospital that you can consult the imaging of patients in emergency and non-emergency conditions?

- a. Yes
- b. No

19. Do you have a minor specialization?

- a. No
- b. Clinical neurophysiology
- c. Intensive care
- d. Algology

20. Is there a neurology minor specialist in your institution?

- a. Yes
- b. No

21. Is there a comprehensive stroke center in your institution or nearby region where thrombectomy is performed ?

- a. There is a comprehensive stroke center in my institution
- b. There is a comprehensive stroke center in nearby region
- c. No

22. Do you follow up patients as a primary physician in the intensive care unit in your institution?

- a. Yes
- b. No

23. Do you have your own neurology intensive care unit or beds reserved for neurology patients in the general intensive care unit?

- a. Yes
- b. No

24. How is your shifts?

- a. Branch night shift
- b. On-call duty
- c. Hospital responsible physician (head physician) night shift
- d. I have no night shift or on-call duty

25. How many branch night shifts do you have per month?

- a. 6
- b. 4-6
- c. 3-5
- d. 1-2

26. How many on-call duties do you have per month?

- a. All month
- b. 15 days
- c. 10 days
- d. 1 days

27. On average, how many patients are consulted to you during an on-call duty or branch night shift?

- a. 0-2
- b. 2-4
- c. 4-6
- d. 6-8
- e. >10

28. Are you on leave after a night shift?

- a. Yes
- b. No

29. How many patients do you examine on average in a day?

- a. 1-20
- b. 20-40
- c. 40-60
- d. 80-100
- e. > 100

30. Which of the electrophysiological examinations are performed in your institution? You can mark more than one.

- a. None
- b. EMG
- c. EEG
- d. Polysomnography
- e. Video EEG monitoring

31. Is sufficient time allocated for education and/or scientific activities in your institution?

- a. There is sufficient time allocated for education
- b. There is sufficient time allocated for scientific activities
- c. There is sufficient time allocated for education and scientific activities

32. Can you find sponsors for participation in scientific congresses and meetings?

- a. Always
- b. Oftenly
- c. Sometimes
- d. No, I cannot

33. What is your average monthly income?

- a. <10.000 TL
- b. 10.000-15.000 TL
- c. 15.000-20.000 TL
- d. 20.000-25.000 TL
- e. >25.000 TL

34. Do you think your income is at the level you deserve?

- a. Yes
- b. No

35. Have you thought about quitting or changing your job in the last 1 year?

- a. Yes, sometimes
- b. Yes, oftenly
- c. No

36. Do you want to retire immediately when you qualify for retirement?

- a. Yes
- b. No

37. If you had just graduated from high school, would you choose to study medicine again?

- a. Yes
- b. No

38. If you graduated from medical school, would you choose neurology again?

- a. Yes
- b. No

39. When you have a legal or administrative problem related to your job, which of the following do you think you will get help from?

- a. Ministry of Health and administrative sciences affiliated to the ministry
- b. Medical Chambers and Turkish Medical Association
- c. Physician Associations
- d. Social Media