

MEDICAL RESIDENTS ARE FACING BURNOUT, WHO ARE AT STAKE? A CROSS-SECTIONAL STUDY IN THREE UNIVERSITY HOSPITALS IN ISTANBUL

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ABSTRACT

Introduction: Residency has become a vulnerable period for burnout among physicians because many common and specific stress factors in healthcare. Our study aims to evaluate the burnout level among medical residents in three tertiary care hospitals and to identify the relationship between socio-demographic and occupational factors with the burnout level.

Material and Methods: We conducted a cross-sectional study in December 2019. Data was collected using self-administered questionnaires from 490 residents (64.2% of 763 eligible) who work at hospitals of three medical oriented universities in Istanbul, Turkey.

Results: Mean scores for subscales of Maslach Burnout Inventory (Turkish adaptation) are 19.1±7.7 for Emotional Exhaustion, 7.3±4.3 for Depersonalization, and 20.7±5.1 for Personal Achievement. Female residents or residents who pursue surgical specialties or have more night shifts, experience more Emotional Exhaustion than their counterparts. Depersonalization increases accordingly with the increase of years in residency and the number of night shifts. Residents working at the hospital of foundation universities feel higher Personal Achievement than those of the state university.

Conclusion: The burnout level of the participants is concerning and appears to be influenced by several modifiable occupational factors. Particularly, the impact of each year of residency training and the number of shifts should be considered carefully.

Key Words: Burnout, medical residents, medical education, physician, surgeon, tertiary care

INTRODUCTION

Burnout is broadly defined as “a state of mental and physical exhaustion related to work or caregiving activities” (1). It is usually characterized by three components: emotional exhaustion, depersonalization, and a lack of sense of personal accomplishment (2). Though it is not considered a medical condition, it was included in the 10th Edition of the International Classification of Disease of the

World Health Organization (1). Later, in the 11th edition, burnout was classified as a factor influencing health status and was described with the three well-accepted components (3).

There are considerable studies about burnout in health professionals because of its impact and predisposing factors. It has serious negative impacts on health professionals as well as on health organizations. It causes mental health problems,

such as anxiety, depression, suicidal tendency, substance abuse, and also, it causes physical health problems, such as cardiovascular diseases. In the professional aspect, it decreases job satisfaction, and it leads to impaired interprofessional relationships and the discontinuation of education. Beyond its effects on individuals, burnout also causes organizational and system-level problems, such as low safety and quality of care, increase in medical errors and recovery times, and decrease in patient satisfaction and productivity (1), (2), (4). Also, the consequences of burnout are likely to be quite costly for organizations (4).

Burnout occurs due to chronic exposure to stress (4). Many qualitative studies elaborated on the stress factors from the perspective of the physician who faced them. In a recent meta-synthesis of 33 studies, Sibeoni et al. (5) grouped those factors into three major categories: organizational, relational, and individual. Some of the most studied organizational factors are high workload, poor working conditions, lack of time, and direct exposure to life-threatening circumstances. Relational factors include the relationship problems in the team, too much empathy, and the lack of recognition from both patients and their families. Some individual stress factors are the burden of responsibility, doubts about their abilities, and the feeling of guilt (5). Besides those factors, studies suggested many potential factors related to burnout such as limited healthcare resources, long working hours, the lack of autonomy, work-life imbalance, and lawsuits (2).

As is emphasized in the previous studies, health professionals are vulnerable to burnout due to the demands of their work (1). Since many of those general stress factors have intensified and some specific factors have been added, the residency period is worthy of interest. Burnout can occur in residency when there is a high workload and responsibility combined with low salaries, control, less resting time, and less experience. (1), (4). A recent meta-analysis of 47 studies concluded that more than half of the medical and surgical residents experience burnout (2).

A cross-sectional study with a representative sample of physicians in Istanbul, Turkey showed that residents have significantly higher burnout levels than general practitioners and specialists (6). The same study also suggested that the public ownership of a health facility influences the burnout level (6).

Recent studies on the burnout of medical residents in Turkey are mostly limited to a single hospital or single-specialty and have small sample sizes (7). A study from a state-owned university hospital indicated that factors, such as the specialty type, daily working hours, the number of night shifts, and the appreciation from superiors create strongly significant differences in burnout levels of residents (8). In another study from a Teaching and Training Hospital pointed out the years in residency as an important factor (9). A study from a different university hospital endorsed the effects of the number of night shifts and years in residency (10).

The aim of our study is to evaluate the burnout level among the medical residents in three tertiary care hospitals and to identify the relationship between socio-demographic and occupational factors with burnout level. This study can contribute current literature by providing a better burnout level estimation for medical residents from multiple centers without having a specialty restriction.

MATERIAL AND METHODS

Subject group

We conducted a cross-sectional study among the medical residents of a group of tertiary care hospitals in İstanbul, Turkey. The study population was the clinical residents (n=763) of a state university hospital and two foundation university hospitals. All three universities were known as medical oriented universities. We did not use any sampling method and we planned to collect data from all residents on a voluntary basis.

Variables

We collected study data by two types of self-administered questionnaires. The first questionnaire included questions about the socio-demographic and occupational characteristics of the participants as independent variables. The dependent variable, burnout level was operationalized with second questionnaire which comprises the Turkish adaptation of the Maslach Burnout Inventory (MBI). The MBI is considered the gold standard measure for burnout (11), (12), (13). Ergin et al. (14) adapted the MBI to Turkish and controlled its validity and reliability. It is a questionnaire composed of twenty-two items with each item asking the frequency of the experience of certain feelings related to work using a 5-level rating scale ranging from 0 (never) to 4 (every

day). The MBI evaluates the burnout in three subscales: (i) the emotional exhaustion, consisting of nine items, measuring the reduced energy and job enthusiasm, emotional and cognitive distancing from the job; (ii) depersonalization, consisting of five items, measuring cynicism, lack of engagement and distancing from the patients, the treatment of patients as inanimate, unfeeling objects; and (iii) personal accomplishment, consisting of eight items, measuring perception of having an influence on others, working in harmony with others and dealing with potential problems efficiently (15). Independent scores are calculated for each subscale. High emotional exhaustion or depersonalization and low personal accomplishment scores indicate burnout. In our study group, the MBI was a reliable instrument with high coefficients of internal consistency (Cronbach's $\alpha=0.895$ for emotional exhaustion, $\alpha=0.768$ for depersonalization, and $\alpha=0.778$ for personal accomplishment subscales).

We collected data via self-filled forms in participants work settings in December 2019. Residents of laboratory-based specialties were not included in the study because the inventory was clinical-oriented.

Statistical Analysis

We analyzed the collected data by the SPSS v.22 software. The statistical significance was evaluated by Student's t-test for the variables which had two groups. One Way Analysis of Variance (ANOVA) was done for the variables which had more than two groups. The post-hoc one-by-one analysis was done by the Tukey test for the significant ANOVA results. Independent variables that had a significant effect on burnout scores were further evaluated by Multiple Regression Analysis for each of three subscales. The significance threshold was considered as 0.05 in statistical tests. The results' summaries are presented in tables.

Ethics

The study is conducted in compliance with The Principles of Helsinki Declaration. The informed consent of study participants was obtained before data collection. The ethical approval was obtained from the Ethics Committee for Non-invasive Clinical Studies of the *** University on November 27th, 2019 (No: 1018). This study did not receive any external funding. The authors declare no conflict of interest.

Table 1. Distribution of residents by their demographic and occupational characteristics

Characteristic	Number (n)	Percentage (%)
Gender		
Male	239	48.8
Female	251	51.2
Specialty Type		
Non-surgical	291	59.4
Surgical	199	40.6
Years in Residency		
1	152	31.0
2	133	27.1
3	104	21.2
4+	101	20.6
Number of Night Shifts (monthly)		
0	52	10.6
1-5	134	27.3
6-10	296	60.4
>11	8	1.6
Hospital Type		
State	291	59.4
Foundation	199	40.6
Total	490	100

RESULTS

The total number of medical residents who completed the questionnaires was 490 (participation rate=64.2%). The mean age was 27.9 ± 2.4 (range: 24 - 41). The distribution of the participants by demographic and occupational characteristics is given in Table 1.

Mean subscale scores of burnout syndrome by resident characteristics are presented in Table 2. As it is seen from Table 2, the differences between the mean Emotional Exhaustion scores are statistically significant for gender, specialty, and "years in residency" categories. Females have significantly higher scores than males (19.9 ± 8 and 18.3 ± 7.2 respectively; $p=.026$). Residents of surgical specialties have a higher mean Emotional Exhaustion score (20.3 ± 7.6) than non-surgical specialties (18.3

Table 2. Mean scores of burnout subscales by various characteristics of residents

Characteristics	Subscale Scores of Burnout		
	Emotional Exhaustion Mean \pm SD	Depersonalization Mean \pm SD	Personal Accomplishment Mean \pm SD
Gender			
Male (n=239)	18.3 \pm 7.2	7.3 \pm 4.3	21.0 \pm 5.4
Female (n=251)	19.9 \pm 8.0	7.3 \pm 4.3	20.5 \pm 4.8
	t=2.234 p=.026*	t=0.007 p=.995	t=-1.133 p=.258
Specialty Type			
Non-surgical (n=291)	18.3 \pm 7.6	7.0 \pm 4.2	20.9 \pm 5.0
Surgical (n=199)	20.3 \pm 7.6	7.7 \pm 4.4	20.5 \pm 5.3
	t=-2.753 p=.006*	t=-1.654 p=.099	t=0.723 p=.470
Years in Residency			
1 (n=152)	17.7 \pm 7.4	6.5 \pm 3.9	21.0 \pm 4.9
2 (n=133)	20.3 \pm 7.4	7.9 \pm 4.6	20.1 \pm 5.4
3 (n=104)	20.2 \pm 8.1	7.7 \pm 4.3	21.0 \pm 5.1
4+ (n=101)	18.5 \pm 7.5	7.1 \pm 4.3	20.7 \pm 5.1
	F=3.883 p=.009*	F=3.090 p=.027*	F=0.925 p=.428
Number of Night Shifts (monthly)			
0 (n=52)	17.3 \pm 7.5	5.9 \pm 3.8	20.3 \pm 5.2
1-5 (n=134)	19.0 \pm 7.9	7.4 \pm 4.1	20.4 \pm 5.1
6-10 (n=296)	19.4 \pm 7.6	7.4 \pm 4.4	21.0 \pm 5.1
>10 (n=8)	19.8 \pm 4.9	9.0 \pm 2.3	18.0 \pm 4.2
	F=1.196 p=.311	F=2.325 p=.074	F=1.433 p=.232
Hospital Type			
State (n=291)	18.9 \pm 7.9	7.3 \pm 4.4	20.2 \pm 5.0
Foundation (n=199)	19.4 \pm 7.3	7.2 \pm 4.2	21.5 \pm 5.2
	t=-0.715 p=.475	t=0.323 p=.747	t=-2.916 p=.004*
Total (n=490)	19.1 \pm 7.7	7.3 \pm 4.3	20.7 \pm 5.1

\pm 7.6), which is also significant ($p=.006$). The mean Emotional Exhaustion score of the 1st-year residents is significantly lower than the 2nd, 3rd, and 4th-year residents ($p=.009$) while the differences between 2nd, 3rd, and 4th-year residents are not significant.

Similarly, 1st year residents have significantly the lowest mean of depersonalization score compared to the other groups ($F=3.090$ $p=.027$). The differences between the mean depersonalization scores are not statistically significant among the groups of gender, specialty type, hospital type, number of night shifts.

The mean Personal Accomplishment scores of the residents of foundation university hospitals (21.5 ± 5.2) are significantly higher ($p=.004$) than public university hospital residents (20.2 ± 5). There is no statistically significant difference among the mean Personal Accomplishment scores of other variable groups. Multiple Regression Analysis results for each of the three subscales of the Maslach Burnout Inventory are presented in Table 3.

As it is seen in Table 3, variables which have a significant effect on the "Emotional Exhaustion" are

Table 3. Multiple linear regression results: Variables associated with Emotional Exhaustion, Depersonalization, and Personal Achievement scores

Independent variables	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	β	p	β	p	β	p
Age	-.019	.734	-.079	.155	.018	.743
Gender 1-Male 2-Female	.147	.002	.030	.521	-.055	.243
Specialty type 1-Non-surgical 2-Surgical	.109	.023	.037	.442	-.035	.462
Years in residency	.106	.066	.140	.016	-.012	.839
Number of night shifts	.113	.028	.121	.020	-.018	.726
Hospital type 1-State 2-Foundation	.035	.440	-.010	.824	.129	.005
	R ² = .045		R ² = .024		R ² = .021	

gender ($\beta=3.176$, $p=.002$), specialty type ($\beta=2.288$, $p=.023$), and the number of night shifts per month ($\beta=2.203$, $p=.028$). As it is identified in bivariate analysis, female residents have a higher mean Emotional Exhaustion score than males; residents of surgical specialties have a higher mean Emotional Exhaustion score than non-surgical specialties. The Emotional Exhaustion score increases accordingly with the number of night shifts per month.

The effects of independent variables on “Depersonalization” are shown in Table 3. As it is found in bivariate analysis, “years in residency” appears to be the most significant predictor of depersonalization ($\beta=2.421$, $p=.016$). Depersonalization increases with the years worked in residency. In the multivariate analysis, the number of night shifts per month seems to be another significant predictor of depersonalization ($\beta=2.333$, $p=.020$). The Depersonalization score increases by the increase of the number of night shifts per month.

The results of the multiple regression analysis for the “Personal Accomplishment” subscale of the Maslach Burnout Inventory are presented in Table 3. As it is seen in the table, only one independent variable, the type of the hospital, is significantly associated

($\beta=2.797$, $p=.005$) with Personal Accomplishment. Residents of foundation university hospitals have higher Personal Accomplishment scores in comparison to the residents of the public university hospital.

DISCUSSION

Evaluation of Burnout Levels of Residents

In our study on residents from three tertiary care hospitals, mean scores for subscales of Turkish adaptation of Maslach Burnout Inventory are 19.1 ± 7.7 for Emotional Exhaustion (EE), 7.3 ± 4.3 for Depersonalization (D), and 20.7 ± 5.1 for Personal Achievement (PA).

In comparison with the study of Ozyurt et al. (6), mean scores are higher than those of physicians in general and particularly, residents (EE: 17 ± 5.7 | D: 6.6 ± 3.8 | PA: 20.2 ± 4.5). While it supports that residents encounter burnout more than other physicians, it also points out that since 2006, except for the Personal Achievement dimension, the burnout levels of residents have worsened. It is likely to support the suspicions of Ozyurt et al. (6) about the depletive effect of performance evaluations. But further studies

are required to elaborate on the causes of the increase.

In the study of Çolak et al. (16), which was conducted in a university hospital in İzmir, the mean Emotional Exhaustion score of residents is similar to ours. However, the mean Depersonalization and Personal Achievement scores are higher. (EE: 19.2 ± 8.4 | D: 19 ± 7.7 | PA: 24.4 ± 6.3). Because each subscale is in a different direction, it is not possible to interpret burnout simply as higher or lower than our population. It is possible to think that cities or institutions have their own burnout profiles which vary in dimensions of burnout.

In the study of Pirincci et al. (8), the mean burnout scores of residents (EE: 22.3 ± 8.4 | D: 8.7 ± 4.7 | PA: 18.8 ± 5.9) indicate higher burnout levels than ours in each dimension. It is possible because that hospital provides service in a region which have more limited health resources.

Identification of Influencing Factors

As it is deduced from our multivariate analysis; gender, specialty type, years in residency, the number of night shifts per month, and the hospital type are important factors for different dimensions of burnout among medical residents.

Although Low et al. (2) conclude that the mean age of a resident is a significant moderator, it is not true for our study population as well as other studies that Ishak et al. (1) mentioned.

Female residents experience more emotional exhaustion than males. Ishak et al. (1) mention conflicting results about the effect of gender on burnout in literature. However, Rodrigues et al. (4) conclude that the female gender is a risk factor.

Differences between mean scores of genders in Depersonalization and Personal Achievement subscales are insignificant. Many studies conducted on residents in Turkey were unable to find a significant difference in any of the three MBI subscales (7, 9, 15, 16).

In accordance with the literature (2), we find that residents from surgical specialties have higher emotional exhaustion than non-surgical specialties. This may be due to “dealing directly with life-threatening situations” and “overload of the shifts” (4). It is worth mentioning that the effects of both specialty type and the number of night shifts were significant even after multivariate analysis.

Specialty does not create significant differences in other subscales. Although some studies on Turkish

residents show significant differences only in the Emotional Exhaustion subscale (7, 17), others show significance in other subscales too (16). However, the residents from surgical specialties usually face burnout more than other specialties since residents from surgical specialties experience heavier workload, higher risk, higher stress, and fatigue (17), and also, they spend more time in the operation room instead of having face-to-face conversations (10).

Depersonalization significantly increases with the increase of years in residency. But the effect of “years in residency” is most obvious in the second year of the residency. Though their scores are higher than our results, the change in the pattern of burnout level by years in residency is similar to the studies of Turgut et al. (9) and Göçen et al. (10). It peaks in the second year and, later decreases fairly. This means that burnout usually develops in the early years of residency. It is consistent with the meta-analysis of Ishak et al. (1) where they explain: “By the end of the first year, the rates had increased to 55.3%, with a significant increase in both the depersonalization and emotional exhaustion subscales”. So preventive and rehabilitative measures are better to focus on the first year of the residency.

We were unable to find a significant difference in other subscales by “years in the residency” variable. Turgut et al. (9) found a significance in the Emotional Exhaustion subscale along with Depersonalization. Göçen et al. (10) found significance only in the Emotional Exhaustion subscale. Pirincci et al. (8) were unable to find a significant change in any subscale by years in residency.

Some researchers suggest several causes that initiate burnout in the early years of residency and carry on later, such as low or lost commitment, feeling of incompetence, not gaining professional privileges, responsibility, vague career plans, lack of ability to cope with problems in work-life, starting the work with high workload, being under-experienced and not appreciated (8, 9).

The number of night shifts per month significantly increases Emotional Exhaustion and Depersonalization. It is consistent with previous studies on Turkish residents from different hospitals (6,8,10,17).

Çan et al. (17) think unhealthy lifestyle, loneliness, and taking responsibility for the patients can be the causes of the increase of Emotional Exhaustion with the number of night shifts.

The hospital type appears as the only significant factor in the Personal Achievement dimension since the residents of foundation universities have higher Personal Achievement scores than residents of the public university. It is possibly due to foundational universities provide better opportunities for residents to improve their professional skills.

Ozyurt et al. (6) found that physicians working at private hospitals have significantly higher Personal Achievement. From an administrative standpoint, foundation university hospitals may be considered similar to private hospitals, whereas state-owned university hospitals are considered to be more similar to public hospitals.

Strengths and Limitations of the Study

A recent systematic review identified an information gap about burnout among residents in Turkey in the existing literature (7). Many studies have insufficient sample sizes and mostly, they focus on a single specialty or hospital. The strengths of our study are: it is not limited to a single specialty, it is conducted in three centers, it has a relatively bigger sample of residents, and a good participation rate compared to existing literature. The multivariate analysis was able to enable us to obtain better insights from the data. We acknowledge that our findings cannot be extrapolated to the larger population, but even so, our study will contribute to insufficient knowledge on the current status of Turkey, and it will give information to management and their policies, and also, it will provide a reference point for further research. We did not use any sampling method and we planned to collect data from all residents on a voluntary basis. Participation was voluntary-basis and we do not know reasons for non-participation. Although participation rate was fair, it is possible that some characteristics may lead a selection bias. Not investigating the effect of family-life characteristics of residents, such as marital status and parenting (1), may be considered as another limitation of the study. Further studies that will measure the workloads of residents in detail would be better.

CONCLUSION

This study evaluated the burnout level among the medical residents from all clinical medical specialties in three different tertiary care hospitals in Turkey. The burnout level of residents in the study is concerning. Various dimensions of burnout are found to be influenced by several socio-demographic and

occupational factors, such as gender, specialty type, years in residency, the number of night shifts, and hospital type. It is suspected that most of these factors are due to modifiable conditions. Health care managers and policymakers may improve the status of medical residents by considering the findings of the study. Particularly, the patterns of the effects of years in residency and the number of night shifts are worth attention.

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Conflict of interests: The authors declare no conflict of interest.

Ethical approval: The study is conducted in compliance with The Principles of Helsinki Declaration. The informed consent of study participants was obtained before data collection. The ethical approval was obtained from the Ethics Committee for Non-invasive Clinical Studies of the İstanbul Medipol University on November 27th, 2019 (No: 1018).

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