RESIDENT & FELLOW SECTION

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Residency Training: Determinants of burnout of neurology trainees in Attica, Greece

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ABSTRACT

Objective: The purpose of our cross-sectional study was to estimate the rate of burnout and identify its determinants among neurology residents in Attica, Greece.

Methods: In total, 131 placements for neurology training over 18 hospitals were available. All residents were approached and were asked to participate in the study by anonymously completing a questionnaire. Job demands and resources (JD-R) were examined via a 31-item questionnaire assessing 8 factors based on the JD-R model. Burnout was measured with the Maslach Burnout Inventory (MBI). The emotional exhaustion + 1 criterion was used to distinguish respondents with and without burnout.

Results: A total of 116 residents participated in the study (response rate 88.5%). In total, 18.1% of the participants were experiencing burnout. Multivariate analysis showed that each increased point in the total score of the factor regarding opportunities for professional development was associated with lowering the odds of burnout by 28.7%.

Conclusions: Burnout among neurology residents is associated with decreased professional development. Educators and program directors need to identify those residents at high risk of burnout and design interventions to promote residents' resilience and mental health. ***Neurology*®** **2015;85:e81–e84**

GLOSSARY

DP = depersonalization; **EE** = emotional exhaustion; **JD-R** = job demands-resources; **MBI** = Maslach Burnout Inventory; **PA** = personal accomplishment.

Awareness that trainee doctors are prone to burnout has grown over recent years.[1] The consequences of burnout include less productive working hours, poor quality of life, poor mental health, and increased risk for medical errors.[2]

Several studies have focused on estimating the burnout rates among medical residents, showing that the rates vary among specialties. Neurology not only has a very high rate of burnout but also has the poorest work–life balance.[3]

As proposed by Demerouti et al.,[4] in the job demands-resources (JD-R) model, burnout can develop where demands are increased and resources are limited, as such environments can lead to physical exhaustion and reduce the employees' motivation. Studies that have used the JD-R or similar models among health care professionals have shown that time pressure,[5] lack of autonomy, and lack of opportunities for professional development may lead to burnout[6] as well as increased psychological distress.[7]

The purpose of our cross-sectional study was to estimate the rate of burnout and identify its determinants among neurology trainees in Attica, Greece, using the JD-R model.

METHODS

Procedure and participants. Attica is a region covering the metropolitan area of Athens, the capital of Greece. About 3.8 million people live in the region (more than 35% of the total Greek population). Within Attica, 18 hospitals provide neurology training. In total, 131 such placements are available (more than 55% of the total neurology training placements in Greece).

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Table 1 Items used to assess job demands and resources, grouped into factors

Autonomy
Can you decide by yourself how to carry out your job?
Do you resolve problems that come up at work by yourself?
Can you decide on your own the order in which you carry out your professional duties?
Professional development
Does your work offer you the sense that you can achieve something beneficial for the patient?
Do you feel that your work offers you the opportunity to learn new things?
Do you believe that there are opportunities to progress in your professional development?
Support from colleagues
Can you seek help from your colleagues when necessary?
In your work, do you feel that you are appreciated by your colleagues?
Can you count on your colleagues' support when difficulties arise?
Supervisor support
My supervisor informs me how satisfied he/she is with my work.
My supervisor shows an interest in my problems and my expectations regarding my job.
I feel that my supervisor appreciates me.
My supervisor uses his/her influence to help me resolve problems at work.
My supervisor is friendly and open toward me.
Workload
Are you working under time pressure?
Do you have too much work to do?
Do you need to work fast?
How often do you have to work very hard to complete tasks?
Intellectual demands
Does your work need increased caution or precision?
Is your work mentally very challenging?
Does your work require constant concentration?
Emotional demands
Is your job emotionally harsh?
Are you dealing with things that have an emotional impact on you at your work?
Do you face emotionally charged situations at your work?
Do you have to deal with patients or relatives who keep complaining despite your best efforts to help them?
Are you in contact with demanding patients or relatives at your job?
Do you have to face patients or relatives who do not respect you and are impolite?
Work–home interference
Are you irritable at home because your job was demanding?
Are you struggling to fulfill your family commitments because you are constantly thinking about work?
Do you have to cancel appointments with your partner, your family, or your friends because of work commitments?
Does your work timetable make it difficult for you to be fulfilling your family commitments?

Each item was rated on a 5-point Likert scale ranging from never to always.

All neurology residents in Attica were approached and asked to participate in the study. An anonymous questionnaire was administered to all trainees, who were asked to return it completed in a sealed envelope that was placed in a nontransparent empty box by the participant, in order to ensure the anonymity of the responses. Participation in the study was voluntary.

The study protocol was approved by the local ethics committee.

Measures. Collected data included demographic and other work-related characteristics such as stage of training, true working hours per day, number of on-calls per month, and overall compliance with the European Working Time Directive, which includes a maximum of 56 hours per working week (including overtime).

Job demands and resources were assessed via 31 items, which were rated on a 5-point Likert scale (ranging from never to always). These items were grouped into 8 factors (table 1). The score of each factor was calculated as the sum of its items' scores. The survey items were subsets of already validated instruments and constituted complete subdomains that were part of the original instruments.[6]

The Maslach Burnout Inventory (MBI), a validated 22-item questionnaire, was used to measure burnout.[8] Each item of the MBI is rated on a 7-point Likert scale (ranging from never to every day). The MBI yields 3 subscale scores (calculated as the sum of its subscale item scores) that assess burnout in relation to its 3 dimensions: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). Prins et al.[9] suggested that "the most effective way of diagnosing burnout seems to involve using a system of high scores on both EE and DP, or a high score on EE combined with a low score on PA. Scores $\geq$75% are considered high and scores $\leq$25% are considered low." In keeping with these suggestions, we defined burnout as a high score on EE, accompanied by high DP or low PA (i.e., EE + 1 criterion). Given that there were no established burnout cutoff scores for the Greek version of the MBI, distribution of each subscale score of our study population was divided into quartiles, and high scores meant scoring in the 75th percentile or higher, whereas low scores meant scoring in the 25th percentile or lower. Thus, a high score on both MBI-EE and MBI-DP, or a high score on MBI-EE combined with a low score on MBI-PA, were used to distinguish respondents with and without burnout.

Statistical analysis. A database was developed using the statistical software package SPSS (version 16.0 for Macintosh; Chicago, IL). Descriptive statistics were examined for each variable. Statistical comparisons were performed between the residents with and without burnout concerning demographic characteristics, job demands and resources, and the other measured work-related factors. Categorical variables were compared using the χ^2 test, normally distributed continuous variables by the Student t test, and non-normally distributed continuous variables by the Mann-Whitney U test.

Where statistically significant differences were found, these variables were entered in the logistic regression model, with burnout being the dependent variable. All accuracy and generalization assumptions for the model were checked. Level of significance was set at the 0.05 level.

RESULTS The study took place between October 2014 and November 2014. A total of 116 residents participated (response rate 88.5%). The study sample had a mean age of 34.5 ± 3.6 years (range 26–45); 64 (55.2%) were women and 69 (59.5%) were single. The mean remaining time to complete neurology training was 18.0 ± 10.8 months, the mean working hours per day, not including on-call duties, was 7.1 ± 1.1 hours, and the mean number of on-calls per month was 4.7 ± 1.7. The number of doctors exceeding the limit set up by the European Working Time Directive was calculated to be 14 (12.1%).

Table 2 Characteristics of neurology residents with and without burnout

	Residents with burnout (n = 21)	Residents without burnout (n = 95)	*p* Value
Demographics			
Age, y	34.6 (4.5)	34.5 (3.4)	0.968
Male sex	13 (61.9)	39 (41.1)	0.082
Marital status			0.704
Single	14 (66.7)	55 (57.9)	
Married	9 (33.3)	39 (41.1)	
Divorced	0 (0.0)	1 (1.1)	
Work-related characteristics			
Months remaining to complete training	19.3 (10.7)	17.7 (10.8)	0.525
Working hours per day (not including on-call duties)	7.3 (1.3)	7.1 (1.0)	0.398
On calls per month	4.6 (2.4)	4.7 (1.5)	0.851
Days off per month	1.8 (1.5)	2.5 (1.6)	0.057
EWTD violated	5 (23.8)	9 (9.5)	0.068
Job demands and resources			
Social support	11.5 (2.7)	12.3 (2.5)	0.163
Supervisor support	12.5 (5.1)	15.3 (4.6)	0.014[a]
Workload	15.1 (5.2)	14.7 (3.0)	0.663
Intellectual demands	11.6 (2.8)	11.8 (2.2)	0.762
Emotional demands	22.3 (4.3)	20.8 (3.8)	0.113
Work–home demands conflict	12.6 (3.8)	9.5 (2.7)	0.007[b]
Autonomy	7.4 (2.2)	9.6 (2.7)	0.001[b]
Opportunities for professional development	7.6 (2.3)	10.7 (2.9)	<0.001[c]

Abbreviation: EWTD = European Working Time Directive.
Noncontinuous variables are given as percentages. Continuous are presented as means with their corresponding SD.
[a] $p < 0.05$.
[b] $p < 0.01$.
[c] $p < 0.001$.

In total, 21 residents (18.1%) were found to experience burnout. Table 2 shows the characteristics of those with and without burnout syndrome. There were no statistically significant differences regarding demographic and work-related characteristics between the 2 groups. However, regarding the JD-R characteristics, residents with burnout had less support from their supervisor, experienced increased workload, had experienced conflicts in the interface between familial and professional life, had less autonomy at work, and had fewer professional development chances.

The following independent variables were entered into the multivariate logistic regression model: sex, age, supervisor support, work–home demands interface, autonomy, and opportunities for professional development. The model χ^2 value indicated that there was a statistically significant overall relationship between the dependent variable and the set of independent variables ($\chi^2 = 29.27$, $df = 6$, $p < 0.001$). The χ^2 value associated with the Hosmer-Lemeshow test ($\chi^2 = 6.17$, $df = 8$, $p = 0.628$) indicated a good overall model fit. The Nagelkerke R^2 was equal to 36.6%. According to the Wald criterion, only the unstandardized coefficient for opportunities for professional development ($\beta = -0.338$) was found to reach statistical significance ($p = 0.012$). Each increased point for opportunities for professional development was associated with a 28.7% decrease in the odds of burnout.

DISCUSSION The results of this cross-sectional study show that burnout is not uncommon among neurology residents of Attica, Greece. Almost 1 out of 5 residents has burnout syndrome. The novelty of our study is that it was designed to measure burnout specifically among neurology residents.

In their recent review of physician burnout, Sigsbee and Bernat[2] highlighted that studies of motivational factors in the workplace suggest several interventions to prevent burnout. These interventions include personal or group counseling, identification and elimination of meaningless required hassle factors, redesign of practice, and creation of a culture that promotes career advancement, mentoring, and recognition of accomplishments.[2] In our study, we used the JD-R model, showing, in the univariate analysis, that supervisor support, work–home demands interface, autonomy, and opportunities for professional development were factors significantly associated with burnout among neurology trainees. Thus, our findings may answer some of the fundamental questions set by Busis[10] in his editorial, as these findings showed that the stage of training and the working hours do not affect burnout probability, especially when opportunities for professional development remain unhampered.

Our study cannot answer other questions set by Busis,[10] such as whether burnout rates, determinants, and characteristics are different between trainee and trained neurologists. Another limitation of our study is that our study population comprised residents in Greek training programs and results may not be generalizable to other settings, such as in other countries of the European Union or the United States. Finally, although we cannot know what the answers of the nonrespondents would be, given the very high response rate, our results probably are not confounded by this.

Our results cast light on other important aspects of residency training as, along with gaining clinical experience and improving practical skills, residents are in need of good teachers and mentors, good support from colleagues, a manageable workload, and a working environment with fewer emotional demands. Autonomy is crucial, as well as having a good balance between home and work demands. Interestingly, the

multivariate analysis showed that opportunities for professional development remained the most significant determinant of burnout. Such opportunities may include research opportunities, chances of attending educational seminars or conferences, and active involvement in teaching medical students or more junior doctors.

Preventing burnout is crucial not only for health service employees but also for health service users. Regional health care systems should avail educators and program directors with the provisions needed to facilitate burnout prevention, initially by providing further opportunities for residents' professional development.

AUTHOR CONTRIBUTIONS

Panagiotis Zis: drafting/revising the manuscript, study concept and design, data collection, statistical analysis, accepts responsibility for conduct of research and final approval. Artemios K. Artemiadis, Maria Lykouri, Sophia Xirou, Andromachi Roussopoulou, Ermioni Papageorgiou, Eleni Bakola: drafting/revising the manuscript, data collection, accepts responsibility for conduct of research and final approval. Fotios Anagnostopoulos: drafting/revising the manuscript, study concept and design, accepts responsibility for conduct of research and final approval.

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DISCLOSURE

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