

Burnout in European family doctors: the EGPRN study

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Introduction. The aim of this study was to determine the prevalence of burnout, and of associated factors, amongst family doctors (FDs) in European countries.

Methodology. A cross-sectional survey of FDs was conducted using a custom-designed and validated questionnaire which incorporated the Maslach Burnout Inventory Human Services Survey (MBI-HSS) as well as questions about demographic factors, working experience, health, lifestyle and job satisfaction. MBI-HSS scores were analysed in the three dimensions of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA).

Results. Almost 3500 questionnaires were distributed in 12 European countries, and 1393 were returned to give a response rate of 41%. In terms of burnout, 43% of respondents scored high for EE burnout, 35% for DP and 32% for PA, with 12% scoring high burnout in all three dimensions. Just over one-third of doctors did not score high for burnout in any dimension. High burnout was found to be strongly associated with several of the variables under study, especially those relative to respondents' country of residence and European region, job satisfaction, intention to change job, sick leave utilization, the (ab)use of alcohol, tobacco and psychotropic medication, younger age and male sex.

Conclusions. Burnout seems to be a common problem in FDs across Europe and is associated with personal and workload indicators, and especially job satisfaction, intention to change job and the (ab)use of alcohol, tobacco and medication. The study questionnaire appears to be a valid tool to measure burnout in FDs. Recommendations for employment conditions of FDs and future research are made, and suggestions for improving the instrument are listed.

Keywords. Burnout, Europe, general practice, job satisfaction, job stress.

Introduction

Job-related 'burn out' or 'burnout' has been identified as an occupational hazard for various professionals involved in people-oriented services. Burnout is a syndrome, with reported symptoms including exhaustion,

frustration, anger, cynicism and a feeling of ineffectiveness and/or failure. An important element of the syndrome is a negative impact on job performance.^{1,2}

The predominant multidimensional model of burnout defines it as a psychological response to chronic interpersonal job stressors, characterized by overwhelming

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exhaustion, feelings of cynicism and detachment from the job.¹ Three dimensions of the syndrome are described: emotional exhaustion (EE) is the depletion of one's emotional resources and reflects the basic stress dimension of burnout; depersonalization (DP) usually develops due to the effect of EE and exhibits features of detachment and, eventually, dehumanization; and reduced personal accomplishment (PA) reflects reduced feelings of competence and productivity at work, which are linked to depression.^{1,2}

Factors related to burnout amongst professionals, including doctors, include situational factors [organizational commitment and hierarchy, absence of job resources (e.g. inadequate pay), overload, role conflict and ambiguity, poor career progression and lack of feedback] and individual characteristics (demographic variables, personality characteristics, external locus of control, job satisfaction, job withdrawal and lack of social support), with the effect of the situational factors being stronger.^{1,3,4}

Although burnout has been described in health professionals⁴⁻⁶ and has been reported to be common in family doctors (FDs),^{5,7-9} there are few published studies, and there is an evident need for further research. This study is an attempt to address this lacuna in the field of research of burnout in FD populations in Europe.

The scale which has demonstrated the strongest psychometric [Psychometrics: the field of study concerned with the theory and technique of psychological measurement, which includes the measurement of knowledge, abilities, attitudes and personality traits. The field is primarily concerned with the study of differences between individuals (<http://en.wikipedia.org/wiki/Psychometrics>)] properties, has been shown to distinguish job-related neurasthenia from other mental disorders¹ and continues to be used most widely by researchers is the Maslach Burnout Inventory—Human Services Survey (MBI-HSS) developed by Maslach and Jackson in the early 1980s.¹⁰ It comprises 22 seven-point Likert-type questions on frequency of symptoms (ranging from '0 = never' to '6 = every day'). The three dimensions are each measured by subscales: EE on a subscale with nine items and a maximum score of 54, DP on a five-item subscale with a maximum score of 30 and a decreased sense of PA (inverse scale, low scores indicate high burnout) on a subscale with eight items and a maximum score of 48.¹⁰ The MBI-HSS has demonstrated good external validity in FDs and similar subscale correlations as in Maslach's normative sample.¹¹

The instrument of choice for this study of burnout is consequently also a questionnaire. Thus, the MBI-HSS was incorporated (unaltered) into a questionnaire designed to measure other factors previously reported to be associated with burnout in FDs.^{8,12-16} The study instrument (Fig. 1) was based on a similar questionnaire piloted previously in the population of interest.¹⁷

This cross-sectional study was designed to address two specific research questions.

Study research questions

- 1) What is the prevalence of burnout in European FDs?
- 2) Which factors are associated with high levels of burnout in European FDs?

Methodology

Study idea

This study was developed from an original idea to study burnout in Turkish medical and education students presented at a meeting of the World Organization of Family Doctors (WONCA) European region¹⁸ and was developed during various meetings of the European General Practice Research Workshop [EGPRW—since renamed 'European General Practice Research Network' (EGPRN)] from 1999 to 2002.^{19,20} Twenty-four EGPRW members from 16 European countries formed an interest group and worked as a team to develop an instrument to collect data on burnout and on factors associated with burnout.

Instrument

Questionnaire design process. A literature search was performed to identify instruments and tools which measure burnout and to identify factors associated with high levels of burnout. The questionnaire instrument was developed on the basis of such literature. It was pilot tested in 2000, the results being published in 2002.¹⁷

Translation of the questionnaire instrument. In those countries where the use of an English-language instrument could potentially pose a language barrier, the questionnaire was translated to the native language by the key co-ordinating FD in that country, and the translation process was cross-checked by cross-translation in most cases (see Table 1).

Questionnaire instrument structure. The final validated questionnaire instrument (Fig. 1) comprised, in order:

- a) a 25-item questionnaire including questions regarding age, gender, marital status, years since qualification as a doctor, years in current workplace, earning, workplace conditions (solo/group, rural/urban setting), working conditions (working hours per week, patients per week, night shifts, weekends worked), intention of changing job, sick leave utilization, sleep patterns, alcohol consumption, smoking and psychoactive medication use;
- b) a seven-point Likert-type job satisfaction question and
- c) the MBI-HSS.

Human services survey

The information you record in this questionnaire will be treated with extreme confidentiality. Your identity will be unknown to us.

Please answer *all* questions as truthfully as you can.

Please only complete this questionnaire if you are a *full-time general practitioner or family doctor*, working either in state employment (including academic or educational work) or private practice, or both.

Please *do not* return this questionnaire if you work 50% or more of your time in another *specialty* besides general practice or family medicine, or if you are presently *retired*.

Thank you for your time.

Age: _____

Sex: _____

Marital status: _____ (married, single, divorced/separated, widowed)

Number of children: _____ (number under 5 years of age: _____)

Years since qualification as M.D.: _____ Years in current position / workplace: _____

Further qualifications: _____

Type of work: (please tick all that apply)

State-employed private practice education/academic

currently in training

other (e.g. occupational health physician) – please specify _____

Do you work solo or in a group setting? (solo/group)

Is your practice mainly rural or urban? rural urban mixed

How much do you earn a month from all your GP/FM work, approximately?

Euro _____

How many patients do you see in one week, on average? _____

How many hours do you work in one week, on average? _____

How many hours a day do you sleep, on average?

_____ (> or = 8) _____ (> 4 but < 8) _____ (< or = 4)

Do you do night visits, or work night shifts (after 8 pm, before 6 am)? (Y/N)

If you do work at night, how many nights a month you do work on average? _____

Do you work on the weekend, or work weekend shifts? (Y/N)

If you do work on the weekend, how many weekends a year are you off? _____

How many days were you off work on sick leave last year? _____

Have you seriously considered changing your job at least once over the past months? _____

yes no undecided

How satisfied are you with your current job? (0 = very little, to 6 = very much) _____

Do you smoke tobacco regularly? (Y/N)

Has your consumption of tobacco increased during the last year? (Y/N)

Do you drink alcohol regularly? (Y/N)

Has your consumption of alcohol increased during the last year? (Y/N)

Have you taken psychoactive medication in the last year? (Y/N)

Please reply to each question below with a score from 0 to 6 (one choice only per question). The meaning of the scores is explained below:

0 = never,

1 = a few times a year or less frequently,

2 = once a month or less frequently,

3 = a few times a month,

4 = once a week,

5 = a few times a week,

6 = every day

FIGURE 1 *Questionnaire instrument*

1. I feel emotionally drained from work
Score =
2. I feel used up at the end of the workday
Score =
3. I feel fatigued when I get up in the morning and have to face another day on the job
Score =
4. I can easily understand how my patients feel about things
Score =
5. I feel I treat some patients as if they were impersonal objects
Score =
6. Working with people all day is really a strain for me
Score =
7. I deal very effectively with the problems of my patients
Score =
8. I feel burned out from my work
Score =
9. I feel I am positively influencing other people's lives through my work
Score =
10. I have become more callous towards people since I took this job
Score =
11. I worry that this job is hardening me emotionally
Score =
12. I feel very energetic
Score =
13. I feel frustrated by my job
Score =
14. I feel that I am working too hard on my job
Score =
15. I do not really care what happens to some patients
Score =
16. Working with people directly puts too much stress on me
Score =
17. I can easily create a relaxed atmosphere with my patients
Score =
18. I feel exhilarated after working closely with my patients
Score =
19. I have accomplished many worthwhile things in this job
Score =
20. I feel like I am at the end of my rope
Score =
21. In my work I deal with emotional problems very calmly
Score =
22. I feel patients blame me for some of their problems
Score =

Thank you for your time.

TABLE 1 *Details of the study process in each participating country: co-ordinator, translation and mailing procedure, sample selection and response rates*

Country	Name of the co-ordinator	Translation from English original version	Cross-translation	Method of distribution	Target population of GPs	Method of sample selection	Number of questionnaires sent out	Date of mailshot	Responses <i>n</i> (%)
Bulgaria	Radost Spiridonova Asenova	Yes	No	Post	5222	Random selection	250	May to September, 2003	69 (27.6)
Croatia	Milica Katić and Zlata Ožvačić	Yes	Yes	Post	2400	Stratified random selection	350	November, 2003	117 (33.4)
France	Alain Moreau	Yes	No	Post	3113	Partly from college list, partly random selection	324	June to September, 2003	178 (54.9)
Greece	Christos Lionis	Yes	Yes	Not specified	1103	Random selection	85	Late 2003 to early 2004	45 (52.9)
Hungary	Péter Kotányi	Yes	Yes	Post	7000	Random selection	299	February, 2003	87 (29.1)
Italy	Francesco Carelli	Yes	No	E-mail		Non-random selection from scientific society and continuing medical education (CME) events	230	not specified	147 (63.9)
Malta	Jean Karl Soler	No	N/A	Post	260	Sent to entire population	260	March, 2003	129 (49.6)
Poland	Pawel R. Nowak	Yes	No	Post	5500	Random selection	282	May to September, 2003	150 (53.2)
Spain	Magdalena Esteve	Yes	Yes	Post	15 474	Stratified random selection	286	April, 2003	86 (30.1)
Sweden	Eva Marklund	No	N/A	E-mail and Fax	5000	Non-random snowball sample	>250	not specified	109 (<43.6)
Turkey	Mehmet Ungan	Yes	Yes	E-mail	500	Non-random selection from Turkish college e-mail distribution list	500	not specified	112 (22.4)
England (UK)	Dick Churchill	No	N/A	Post	30 000	Stratified random sample by region of all the GPs in England	300	April to June, 2003	164 (54.7)
Total							3416		1393 (40.8)

N/A, not applicable.

Data collection procedure

Sampling procedure. The country co-ordinators, one lead FD in each of 12 participating countries who was selected from the burnout study interest group, were tasked to send the questionnaire to a representative sample of their country's FDs.

Sample size. The original target was a sample size of 160 completed questionnaires from each country, calculated to allow the discrimination of a population difference of 10% or more in the mean MBI-HSS burnout scores in any one dimension between two countries to an α -value of 0.05 with a power (β) of 80%, based on the variability of the data obtained from the pilot study. The inclusion criteria were: practising FDs working in private, or state employment. Retired FDs and those working less than 50% full time in family practice were excluded.

Ethical approval

International ethical approval. Many, but not all, country co-ordinators did apply for and obtain ethical approval in their country.

Data entry

Data coding. Each country co-ordinator coded the data from the returned questionnaires into a custom-designed Microsoft Excel²¹ spreadsheet template, and these were then imported into SPSS version 11²² by HY.

Missing values. Up to one missing response per dimension of burnout in the MBI-HSS instrument was replaced with the average score of the rest of that respondent's responses for that dimension (rounded to an integer value). If more than two responses were missing for any one dimension, the score for that dimension was replaced with a 'missing value' code recognized as such by SPSS.

Coding of burnout outcome variables. MBI-HSS scores were output in the three dimensions of burnout and were then transformed into dummy categorical variables for high, average and low burnout in the dimensions of EE, DP and PA as recommended by Maslach using the cutoff values applicable for doctors, as listed below (Maslach C, personal communication, July 6, 2004).¹⁰ However, the burnout outcome variables were re-coded into high and not-high (average or low burnout) for the statistical analyses.

EE: low burnout ≤ 13 , average burnout 14–26, high burnout ≥ 27 (The scoring guide actually recommends that average scores for EE range from 19 to 26. Scores in the range from 14 to 18 are thus difficult to classify. For the purposes of the description of rates of burnout found in this study, EE scores in the range of 14 to 18 were classified as average, to avoid unclassified cases. However, all the statistical analyses performed on the data set used the outcome variable of high as against not high burnout in the three dimensions.)

DP: low burnout ≤ 5 , average burnout 6–9, high burnout ≥ 10 .

PA: high burnout ≤ 33 , average burnout 34–39, low burnout ≥ 40 (inverse scale).

Statistical analysis

Validation of questionnaire instrument in each country. The MBI-HSS section of the questionnaire was internally validated by calculating a Cronbach's alpha coefficient for each dimension [for the nine questions which scored for EE, the five for DP and eight for PA in turn against the respective total for each dimension], for each translation of the questionnaire used in the 12 different countries.

Respondents. Descriptive statistics have been used to tabulate the characteristics of the respondents as

TABLE 2 Cronbach's alpha coefficient of the MBI-HSS instrument scores for each dimension of burnout in each of the versions/translations of the questionnaire used in the 12 countries

Country	Alpha for EE	Worst item-total correlation	Alpha with worst item deleted	Alpha for DP	Worst item-total correlation	Alpha with worst item deleted	Alpha for PA	Worst item-total correlation	Alpha with worst item deleted	MBI-HSS language
England	0.91	0.62 (Q6)	0.91	0.78	0.37 (Q22)	0.80	0.74	0.25 (Q4)	0.75	Original English version
Malta	0.89	0.44 (Q14)	0.90	0.75	0.29 (Q22)	0.77	0.76	0.25 (Q4)	0.77	Original English version
Sweden	0.90	0.44 (Q6)	0.90	0.68	0.29 (Q22)	0.68	0.69	0.12 (Q18)	0.75	Original English version
Bulgaria	0.90	0.16 (Q14)	0.92	0.69	0.26 (Q15)	0.71	0.67	0.09 (Q4)	0.69	Bulgarian one-way translation
Croatia	0.92	0.53 (Q14)	0.92	0.73	0.27 (Q15)	0.75	0.77	0.20 (Q4)	0.78	Croatian one-way translation
Italy	0.88	0.46 (Q20)	0.88	0.73	0.33 (Q11)	0.74	0.83	0.30 (Q12)	0.84	Italian one-way translation
France	0.88	0.45 (Q14)	0.89	0.69	0.37 (Q22)	0.67	0.85	0.49 (Q4)	0.84	French one-way translation
Poland	0.92	0.60 (Q3)	0.91	0.73	0.39 (Q15)	0.71	0.76	0.21 (Q4)	0.76	Polish one-way translation
Greece	0.90	0.45 (Q1)	0.90	0.91	0.67 (Q5)	0.92	0.87	0.07 (Q4)	0.91	Greek, cross-translation
Hungary	0.86	0.25 (Q14)	0.88	0.73	0.31 (Q22)	0.76	0.80	0.40 (Q4)	0.79	Hungarian, cross-translation
Spain	0.86	0.41 (Q3)	0.86	0.75	0.40 (Q22)	0.75	0.78	0.19 (Q4)	0.79	Spain, cross-translation
Turkey	0.87	0.33 (Q16)	0.89	0.46	0.70 (Q15)	0.58	0.80	0.31 (Q21)	0.81	Turkish, cross-translation

For each dimension and for each country, the Cronbach's alpha for the scores from the relevant set of MBI-HSS questions against the total score is tabulated, followed by the worst individual question Cronbach's alpha (question number in parenthesis) and the corrected Cronbach's alpha if that one question were to be deleted. The lowest item-total correlation is highlighted.

TABLE 3 Respondent characteristics (*n* = 1393) as measured by the questionnaire instrument

Categorical variables	Frequencies, <i>n</i> (%, percentage valid) ^a
Country	
Bulgaria (Bu)	69 (5.0)
Croatia (Cr)	117 (8.4)
Hungary (Hu)	87 (6.2)
Italy (It)	147 (10.6)
France (Fr)	178 (12.8)
Malta (Mt)	129 (9.3)
Poland (po)	150 (10.8)
Spain (Sp)	86 (6.2)
Sweden (Sw)	109 (7.8)
Turkey (Tu)	112 (8.0)
England (UK)	164 (11.8)
Greece (Gr)	45 (3.2)
Total	1393 (100.0)
Gender	
Male	758 (54.4, 54.6)
Female	630 (45.2, 45.4)
Missing	5 (0.4)
Marital status	
Married	952 (68.3, 68.7)
Single	325 (23.3, 23.5)
Divorced-separated-widowed	108 (7.8, 7.8)
Missing	8 (0.6)
Number of children less than 5 years old	
0	1002 (71.9, 82.7)
1	170 (12.2, 14.0)
2	40 (2.9, 3.3)
Missing	181 (13.0)
Further qualifications	
Yes	663 (47.6, 70.7)
No	275 (19.7, 29.3)
Missing	455 (32.7)
Type of work	
State employed	717 (51.5, 51.9)
Private practice	607 (43.6, 43.9)
Education/academic	58 (4.2, 4.2)
Missing	11 (0.8)
All choices type of work	
State employed only	571 (41.0, 41.3)
Private practice only	496 (35.6, 35.8)
Education/academic only	58 (4.2, 4.2)
State and private employment	77 (5.5, 5.6)
Private and education/academic	49 (3.5, 3.5)
Private and in training	36 (2.6, 2.6)
State employed and in training	32 (2.3, 2.3)
Other combinations not otherwise specified	65 (4.7, 4.7)
Missing	9 (0.6)
Setting	
Solo	715 (51.3, 53.1)
Group	631 (45.3, 46.9)
Missing	47 (3.4)
Type of practice	
Rural	367 (26.3, 26.6)
Urban	643 (46.2, 46.6)
Mixed	371 (26.6, 26.9)
Missing	12 (0.9)
Hours of sleep	
>8 hours	192 (13.8, 13.9)
≤8 hours	1193 (85.6, 86.1)

TABLE 3 Continued

Categorical variables	Frequencies, <i>n</i> (%, percentage valid) ^a		
Missing	8 (0.6)		
Night visits			
Yes	705 (50.6, 51.0)		
No	676 (48.5, 49.0)		
Missing	12 (0.9)		
Weekend shifts			
Yes	917 (65.8, 66.6)		
No	460 (33.0, 33.4)		
Missing	16 (1.1)		
Sick leave last year			
0 days	834 (59.9, 66.7)		
1 or 2 days	130 (9.3, 10.4)		
3 days or more	286 (20.5, 22.9)		
Missing	143 (10.3)		
Intention of changing job			
Yes	450 (32.3, 32.4)		
No	836 (60.0, 60.1)		
Undecided	105 (7.5, 7.5)		
Missing	2 (0.1)		
Job satisfaction			
1 (low)	74 (5.3, 5.5)		
2	133 (9.5, 9.9)		
3	307 (22.0, 22.9)		
4	410 (29.4, 30.6)		
5	293 (21.0, 21.9)		
6 (high)	122 (8.8, 9.1)		
Missing	54 (3.9)		
Smoking			
Yes	210 (14.4, 14.9)		
No	1152 (82.7, 85.1)		
Missing	40 (2.9)		
Increasing smoking			
Yes	64 (4.6, 33.2)		
No	129 (9.3, 66.8)		
Not applicable (non-smokers)	1152 (82.7)		
Missing	48 (3.4)		
Alcohol consumption			
Yes	386 (27.7, 28.5)		
No	969 (69.6, 71.5)		
Missing	38 (2.7)		
Increasing alcohol consumption			
Yes	73 (5.2, 19.3)		
No	305 (21.9, 80.7)		
Not applicable (non-drinkers)	969 (69.6)		
Missing	46 (3.3)		
Psychotropic medication use			
Yes	200 (14.4, 14.8)		
No	1151 (82.6, 85.2)		
Missing	42 (3.0)		
North/South/East Europe			
North (Sw, UK)	273 (19.6)		
South (Cr, Gr, Tu, Sp, Fr, It, Mt)	814 (58.4)		
East (Hu, Bu, Po)	306 (22.0)		
Continuous variables	<i>n</i> (%)	Mean	SD
Age in years	1391 (99.9)	45.4	8.5
Number of children	1362 (97.8)	1.8	1.1
Years since graduation	1387 (99.6)	19.2	8.5
Years in current position	1365 (98.0)	12.2	9.0
Income difference/income per capita	1313 (94.3)	0.09	1.1
Patients per week	1344 (96.5)	151	83

TABLE 3 *Continued*

Continuous variables	<i>n</i> (%)	Mean	SD
Hours per week	1360 (97.6)	45.9	14
Nights per month	1188 (85.3)	2.3	3.0
Weekends off per year	1119 (80.3)	32.2	17.4
Monthly earning (Euro)	1313 (94.3)	2100	3700
Sick leave days availed of last year	1250 (89.7)	0	2
EE score	1392 (99.9)	24	16
DP score	1393 (100.0)	7	7
PA score	1391 (99.9)	37	11

For categorical variables, *n*, percentage of respondents and percentage of valid responses (ignoring missing values, in italics) are tabulated; for continuous variables, *n*, mean and SD (or *n*, median and IQR if the distribution is non-normal) are tabulated.

^a% valid when missing data excluded.

measured by the questionnaire instrument, including the MBI-HSS scores. Continuous variables which were severely non-normal were re-coded as categorical variables or transformed (income was re-coded as a difference from average for that country, expressed as a proportion of the Organization for Economic Cooperation and Development (OECD) income per capita for that country).

Point prevalence of burnout—research question 1.

Descriptive statistics have been used to present the proportion of respondents who scored as high burnout, average burnout or low burnout in each dimension, with the 95% confidence interval (CI).

Factors associated with high burnout—research question 2.

The associations between each of the three principal yes/no outcome variables (high burnout present or not in each of the three dimensions of EE, DP and PA) and each variable in the questionnaire were explored.

The statistical significance and strength of the associations between the categorical variables and the burnout outcome variables were analysed using Pearson's chi-square test and Cramer's *V* [Cramer's *V* is a chi-square-based measure of the strength of association, which can be used for nominal variables. Values range from 0 (no association) to 1]. The statistical analyses of the distributions of the continuous normal variables within the two categories of the three burnout outcome variables (i.e. high burnout against not high burnout in the three dimensions) were performed using the independent samples *t*-test. Besides the one-way analysis of associations between the independent variables and the three burnout outcome variables as above, a sensitivity analysis was performed to test the associations in a two-way model with country as a control variable.

A multivariate analysis was subsequently performed using SPSS complex samples logistic regression

analysis,²² stratifying samples by country and including as main effects all variables which reached an α level of at least 0.25 ($P \leq 0.25$) in the one-way analysis, with the same burnout outcome variables as the dependent variables. The final model was the one which resulted from a stepwise backward elimination process using the maximum likelihood method. SPSS was used to calculate odds ratios for all independent variables and the 95% CI for the estimate and the α -value (corrected for multiple comparisons using the sequential Bonferroni method).

Results

Table 1 details the sample selection process and study execution in the 12 countries. A total of 1393 completed and analysable questionnaires were returned from more than 3416 sent (the reported number sent out in Sweden was an estimate), giving a response rate of approximately 41%.

Table 2 lists the Cronbach's alpha coefficients of the MBI-HSS instrument and its elements in each translation of the questionnaire. The worst correlation between a question and the total burnout score per dimension is also tabulated, along with the Cronbach's alpha for the scale if that question were to be deleted. The scores for all three dimensions in the various translations range from good to excellent.

Table 3 gives the frequency distribution of the categorical variables and describes the distribution of continuous variables for the respondents. The 1393 respondents (758 males, 54.6%) had a mean age of 45.4 years (SD 8.5 years) and had graduated 19 years previously to filling in the questionnaire (SD 8.5 years), worked 46 hours per week (SD 14 hours), saw 150 patients per week (SD 83 patients) and were roughly evenly distributed amongst the 12 countries (somewhat less respondents in Greece at 45, whilst France and England were the only two countries that achieved the target of 160 responses), with 58% of respondents coming from the South of Europe.

Burnout point prevalence—research question 1

Table 4a lists the frequency distributions of respondents by degree of burnout (high, average or low) in the three dimensions (EE, DP, PA). Table 4b gives the frequency distribution of respondents by presence of high burnout scores in none (0), one or more of the three dimensions (1, 2 or 3). For both tables, 95% CI of the proportion is tabulated. In all, 43% of respondents scored high for EE (95% CI = 40.5–45.6%), 35.3% for high DP (32.9–37.9%), 32.0% low for PA (29.6–34.5%) and 12% of respondents (10.4–13.8%) scored high for burnout in all three dimensions. Only 35.1% of doctors (32.6–37.7%) did not score high for burnout in any dimension.

TABLE 4a Frequency and cumulative frequency distributions of respondents by degree of burnout (high, average and low) with 95% CI in each of the three dimensions

Burnout	EE (n = 1392)	% (95% CI)	Cumulative %	DP (n = 1393)	% (95% CI)	Cumulative %	PA (n = 1391)	% (95% CI)	Cumulative %
High	599	43.0 (40.5–45.6)	43.0	492	35.3 (32.9–37.9)	35.3	445	32.0 (29.6–34.5)	32.0
Medium	557	40.0 (37.5–42.6)	83.0	379	27.2 (24.9–29.6)	62.5	396	28.5 (26.2–30.9)	60.5
Low	236	17.0 (15.1–19.0)	100.0	522	37.5 (35.0–40.0)	100.0	550	39.5 (37.0–42.1)	100.0

TABLE 4b Frequency and cumulative frequency distributions of respondents by high burnout score in none (0) or any one, any two or all three dimensions (1, 2 or 3) with 95% CI

High burnout	n = 1390	% (95% CI)
No dimension	488	35.1 (32.6–37.7)
One dimension	438	31.5 (29.1–34.0)
Two dimensions	297	21.4 (19.3–23.6)
All three dimensions	167	12.0 (10.4–13.8)

Figure 2 depicts the distribution of respondents by percentage with a high burnout score in each of the three dimensions and in all three dimensions by country and for all countries together (with error bars representing 95% CI for proportions). Bulgarian, Italian and English respondents demonstrated high proportions of high EE burnout, Greek, Italian and English respondents demonstrated high proportions of high DP burnout, whilst Greek and Turkish respondents demonstrated high proportions of high PA burnout.

Factors associated with high burnout—research question 2

Tables 5a and 5b list the results of the analysis of association between the three dichotomous burnout outcome variables (a categorical yes/no variable for high burnout in each of the three dimensions of EE, DP and PA) and the questionnaire categorical and continuous variables, variable by variable, respectively. Also listed are the results of the analysis of the association between the categorical and continuous variables measured in the questionnaire and the three dichotomous burnout outcome variables, all questionnaire responses from all countries being analysed together (one way; except for the variable controlled for, i.e. country). Finally, Tables 5a and 5b also list the results of the analysis of association between the categorical and continuous variables measured in the questionnaire and the three dichotomous burnout outcome variables, variable by variable, controlling for country (two way). The strongest associations include those between the burnout outcome variables and country, European region, job satisfaction and intention to change job, the (ab)use of tobacco, alcohol and psychotropic drugs, male sex, age, type of work and sick leave utilization.

Table 6 lists the results of the logistic regression analysis of the categorical and continuous variables measured in the questionnaire controlling for country. The odds ratios, 95% CI and *P*-values are presented. The three models each correctly classify approximately three-quarters of all cases in the database. The model for high EE burnout correctly classifies two-thirds or respondents as having high burnout, whilst the models for high DP and PA burnout perform considerably better in predicting absence rather than presence of burnout. Again, the highest odds ratios were found for job satisfaction and intention to change job, the (ab)use of tobacco, alcohol and psychotropic drugs, male sex, age, type of work and sick leave utilization.

Discussion

In summary, this EGPRN study of burnout in FDs from 12 European countries with a validated tool to measure burnout achieved a response rate of 41%. In all, 43% of respondents scored high for EE burnout, 35% scored high for DP burnout and 32% scored high for PA burnout. Only 35% of respondents did not score high for burnout in any dimension, whilst 21% scored high for burnout in at least two dimensions and 12% scored high for all three. There was a wide variation in the proportions of respondents with high burnout in the various countries. In the 12 countries, between 15% and 68% of respondents scored high for EE burnout, between 12% and 73% for DP burnout, between 12% and 93% for PA burnout, and between 2% and 25% scored high for burnout in all three dimensions. FDs from Southern European countries had significantly lower levels of EE burnout but higher levels of PA burnout. After controlling for country, low job satisfaction, expressed intention to change job, (ab)use of alcohol, tobacco and psychotropic medication, sick leave utilization, younger age, male sex and type of work were associated with high burnout, as previously reported.¹

Table 7 summarizes the comparisons between burnout scores and rates reported previously in the literature and the data from this EGPRN study.^{8,9,17,23–27} Some earlier studies did report lower rates of burnout, but a similar number of recent studies did report

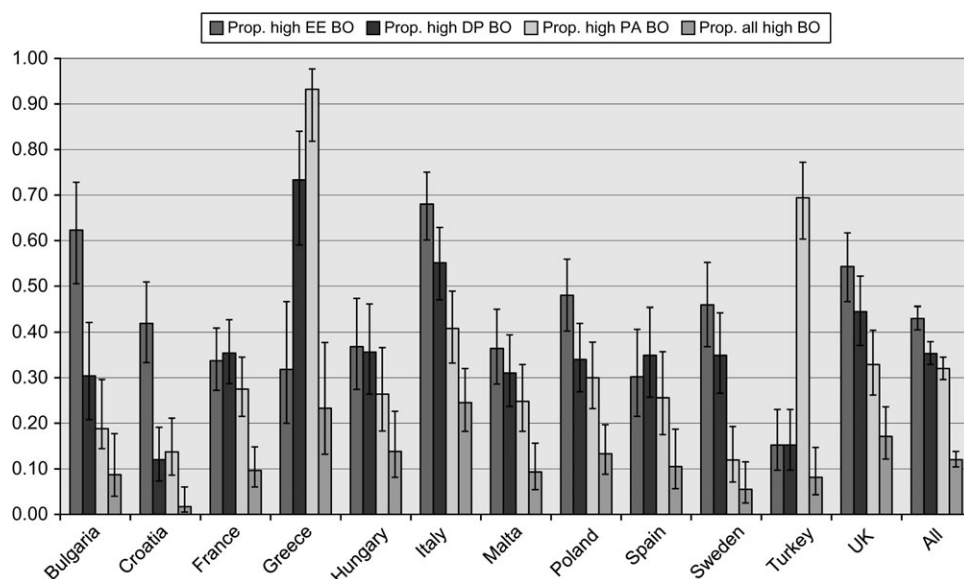


FIGURE 2 Distribution of the proportions of respondents by high burnout score in each of the three dimensions and in all three dimensions in one respondent, by country and for all countries together (with error bars representing 95% CIs for proportions)

similar data. As expected, high burnout was more likely with low job satisfaction and intention to change job.^{1,5,9,28} Additionally,^{1,3,4,8,28} high levels of burnout were found to be more likely with certain organizational factors (country of origin, as surrogate for health care system, and type of work) and increased sick leave utilization, and less so with high workload (patients per week and hours per week) and other job stressors (working nights and weekends). Personal factors such as younger age, sex, marital status and number of children were also linked with burnout, but male sex more strongly so.^{1,28} Academic work type was linked to lower EE, but higher PA burnout, as previously reported.¹ Low self-esteem has been previously reported to be associated with burnout.¹ In this study, we observed that burnout was more likely with increasing smoking, increased use of alcohol and use of psychotropic medication, which may be manifestations of low self-esteem.⁹ Other variables, such as income, were surprisingly rather weakly linked with high burnout, whilst others (non-academic type of work, years since graduation, not having further qualifications, increasing smoking) seemed to be linked with high EE burnout, but make high PA burnout less likely; however, such ambiguous findings have been previously described in burnout research in doctors, for example, by Deckard *et al.*⁴ Generally, the pattern of associated variables appears similar to that reported by Goehring *et al.*⁸ for those variables which were included in both studies.

The questionnaire was constructed with reference to the current literature at the time and included those variables that had been reported to be associated with, or to cause, burnout. Nonetheless, the possibility exists that other variables may have an important role to play. For example, FDs may be more likely to suffer

burnout if they perceive that they have poor control of their place of work,²⁸ but this variable was unfortunately not included in our questionnaire. The rather low response rate in many countries and the consequent failure to achieve the target sample size weakened the power of this study to answer the principal research questions, especially the second one using the regression models. The survey was administered differently in the 12 countries, and also not concurrently. This may have had a variable influence on the non-response rate, potentially introducing bias.

The validity of the questionnaire has been tested in a pilot study, and the results have been published separately by Yaman and Soler.¹⁷ In the pilot study, factor analysis confirmed that the three constructs of EE, DP and PA are distinct and identified which items loaded to which dimension. The results were consistent with Maslach's scoring key except for item 16.¹⁰ The Cronbach's alpha for EE, DP and PA in the pilot study was all high, at 0.67, 0.66 and 0.70, respectively.¹⁷ The MBI-HSS section of the questionnaire has again been validated in the main study using Cronbach's alpha analysis (Table 2). The Cronbach's alpha coefficients for each dimension in each country were, in fact, higher than those found in the pilot study, for most countries (i.e. 0.9 for EE, 0.5 to 0.9 for DP and 0.7 to 0.9 for PA). In general, deleting questions would not improve the internal consistency, with few exceptions. The validity and reliability of the questionnaire appear to be high, based on the analyses and comparisons performed, and the good consistency of the results was obtained between countries and between the pilot and main studies.

The sample size calculation, in retrospect, should have been more precise since the calculated sample

TABLE 5a Associations between categorical variables in the questionnaire and the three burnout outcome variables (high burnout in each of the three dimensions) explored using Pearson chi-square (or Somer's d) and Cramer's V test (or Spearman correlation) as appropriate

Categorical variables	EE high burnout, <i>n</i> (% , 99% CI)	DP high burnout, <i>n</i> (% , 99% CI)	PA high burnout, <i>n</i> (% , 99% CI)
Country			
Overall (95% CI)	599 (43.0, 40.5–45.6)	492 (35.3, 32.9–37.9)	445 (32.0, 29.6–34.5)
Bulgaria (Bu; 95% CI)	43 (62.3, 50.5–72.8)	21 (30.4, 20.8–42.1)	13 (18.8, 14.4–29.6)
Croatia (Cr; 95% CI)	49 (41.9, 33.3–50.9)	14 (12.0, 7.3–19.1)	16 (13.7, 8.6–21.1)
France (Fr; 95% CI)	60 (33.7, 27.2–40.9)	63 (35.4, 28.7–42.7)	49 (27.5, 21.5–34.5)
Greece (Gr; 95% CI)	14 (31.8, 20.0–46.6)	33 (73.3, 59.0–84.0)	41 (93.2, 81.8–97.7)
Hungary (Hu; 95% CI)	32 (36.8, 27.4–47.3)	31 (35.6, 26.4–46.1)	23 (26.4, 18.3–36.6)
Italy (It; 95% CI)	100 (68.0, 60.1–75.0)	81 (55.1, 47.0–62.9)	60 (40.8, 33.2–48.9)
Malta (Mt; 95% CI)	47 (36.4, 28.6–45.0)	40 (31.0, 23.7–39.4)	32 (24.8, 18.2–32.9)
Poland (Po; 95% CI)	72 (48.0, 40.2–55.9)	51 (34.0, 26.9–41.9)	45 (30.0, 23.2–37.8)
Spain (Sp; 95% CI)	26 (30.2, 21.5–40.6)	30 (34.9, 25.7–45.4)	22 (25.6, 17.5–35.7)
Sweden (Sw; 95% CI)	50 (45.9, 36.8–55.2)	38 (34.9, 26.6–44.2)	13 (11.9, 7.1–19.3)
Turkey (Tu; 95% CI)	17 (15.2, 9.7–23.0)	17 (15.2, 9.7–23.0)	77 (69.4, 60.3–77.2)
England (UK; 95% CI)	89 (54.3, 46.6–61.7)	73 (44.5, 37.1–52.2)	54 (32.9, 26.2–40.4)
<i>P</i> -value (one way)	<0.0005**	<0.0005**	<0.0005**
Cramer's <i>V</i> (one way)	0.283	0.280	0.383
Controlling for country (two way)	Greater proportion in Bu, It and UK; smaller in, Fr, Sp and Tu	Greater proportion in Greece, It and UK; smaller in Croatia and Tu	Greater proportion in Greece, It and Tu; smaller in Bu, Croatia and Sw
North/South/East European			
North countries	139 (50.9, 43.2–58.6)	111 (40.7, 33.3–48.5)	67 (24.5, 18.5–31.8)
South countries	313 (38.5, 34.2–43.0)	278 (34.2, 30.0–38.6)	297 (36.6, 32.3–41.0)
East countries	147 (48.0, 40.8–55.4)	103 (33.7, 27.1–40.9)	81 (26.5, 20.5–33.4)
<i>P</i> -value	<0.0005**	0.199	<0.0005**
Cramer's <i>V</i>	0.110		0.117
One-way effect	Smaller proportion in South	None statistically significant	Greater proportion in South
Sex			
Male	337 (44.5, 39.9–49.2)	316 (41.7, 37.2–46.4)	256 (33.8, 29.5–38.4)
Female	260 (41.3, 36.3–46.4)	175 (27.8, 23.4–32.6)	185 (29.4, 25.0–34.3)
<i>P</i> -value	0.224	<0.0005**	0.080
Cramer's <i>V</i>		0.145	
One-way effect	None statistically significant	Greater proportion in males	None statistically significant
Controlling for country (significant two-way effects)	It greater if male	Bu, Tu and UK, as above	None statistically significant
Marital status			
Married	434 (45.6, 41.5–49.8)	343 (36.0, 32.1–40.1)	271 (28.5, 24.9–32.4)
Single	103 (31.7, 25.5–38.7)	104 (32.0, 25.7–39.0)	136 (42.0, 35.1–49.1)
Divorced–separated	58 (53.7, 41.5–65.5)	42 (38.9, 27.8–51.3)	37 (34.3, 23.7–46.6)
<i>P</i> -value	<0.0005**	0.304	<0.0005**
Cramer's <i>V</i>	0.134		0.121
One-way effect	Smaller proportion in singles	None statistically significant	Greater proportion in singles
Controlling for country (significant two-way effects)	Tu, as above	Tu greater in divorced–separated	Fr, Hu and Tu, as above
Children under 5			
0	427 (42.7, 38.7–46.7)	336 (33.5, 29.8–37.5)	292 (29.1, 25.6–33.0)
1	64 (37.6, 28.7–47.5)	52 (30.6, 22.3–40.3)	65 (38.5, 29.4–48.4)
2	15 (37.5, 20.9–57.7)	13 (32.5, 17.1–52.9)	11 (27.5, 13.5–47.9)

TABLE 5a Continued

Categorical variables	EE high burnout, <i>n</i> (% , 99% CI)	DP high burnout, <i>n</i> (% , 99% CI)	PA high burnout, <i>n</i> (% , 99% CI)
<i>P</i> -value	0.404	0.750	0.047*
Cramer's <i>V</i>			0.071
One-way effect	None statistically significant	None statistically significant	Greater proportion if only one child
Controlling for country (significant two-way effects)	It greater if none	It greater if none; Tu if 2	It greater if 1; Sp if 2
Further qualifications			
Yes	299 (45.1, 40.2–50.1)	241 (36.3, 31.7–41.3)	208 (31.4, 26.9–36.2)
No	151 (54.9, 47.1–62.4)	93 (33.8, 26.9–41.5)	64 (23.3, 17.4–30.4)
<i>P</i> -value	0.006**	0.461	0.013*
Cramer's <i>V</i>	0.089		0.081
One-way effect	Greater proportion if no	None statistically significant	Greater proportion if yes
Controlling for country (significant two-way effects)	None statistically significant	None statistically significant	Po greater if no
Type of work (first choice)			
Public	292 (40.8, 36.1–45.6)	269 (37.5, 33.0–42.3)	250 (34.9, 30.5–39.6)
Private	289 (47.6, 42.4–52.8)	212 (34.9, 30.1–40.1)	149 (24.6, 20.4–29.4)
Academic	13 (22.4, 11.6–38.9)	8 (13.8, 5.8–29.2)	40 (69.0, 52.0–82.0)
<i>P</i> -value	<0.0005**	0.001**	<0.0005**
Cramer's <i>V</i>	0.110	0.098	0.199
One-way effect	Smaller proportion if academic	Smaller proportion if academic	Smaller proportion if private; greater proportion if academic
Controlling for country (significant two-way effects)	It greater if private	It greater if private; Mt and Tu if public	It and Mt greater if public
Type of work all choices			
State employed only	240 (42.1, 36.9–47.5)	216 (37.8, 32.8–43.2)	211 (37.0, 32.0–42.4)
Private only	249 (50.2, 44.4–56.0)	179 (36.1, 30.7–41.8)	131 (26.5, 21.7–31.9)
Academic only	13 (22.4, 11.6–38.9)	8 (13.8, 5.8–29.2)	40 (69.0, 52.0–82.0)
Private and state employed	35 (45.5, 31.8–59.9)	26 (33.8, 21.7–48.5)	22 (28.6, 17.4–43.1)
Private and academic	13 (26.5, 13.8–44.9)	14 (28.6, 15.3–45.7)	4 (8.2, 2.5–23.9)
Private and in training	16 (44.4, 25.7–65.0)	7 (19.4, 7.9–40.6)	8 (22.2, 9.6–43.5)
State employed and in train	5 (15.6, 5.4–37.7)	14 (43.8, 24.2–65.4)	6 (18.8, 7.1–41.2)
Others	24 (36.9, 23.4–52.9)	27 (41.5, 27.3–57.4)	19 (29.2, 17.2–45.2)
<i>P</i> -value	<0.0005**	0.005**	<0.0005**
Cramer's <i>V</i>	0.164	0.122	0.221
One-way effect	Greater proportion if private only; smaller proportion if academic only or state employed and in training	Smaller proportion if academic only	Greater proportion if public only or academic only; smaller proportion if private only or private and academic
Controlling for country (significant two-way effects)	It greater if private only	It greater if private only; Tu if public only; Mt if works both public and private	It greater if public only; Mt if public only or both private and public
Setting			
Solo	312 (43.7, 39.0–48.5)	238 (33.3, 28.9–38.0)	222 (31.1, 26.8–35.7)
Group	271 (42.9, 38.0–48.1)	236 (37.4, 32.6–42.5)	188 (29.8, 25.3–34.7)
<i>P</i> -value	0.782	0.115	0.606
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (significant two-way effects)	It greater if solo	Tu greater if group	None

TABLE 5a *Continued*

Categorical variables	EE high burnout, <i>n</i> (% , 99% CI)	DP high burnout, <i>n</i> (% , 99% CI)	PA high burnout, <i>n</i> (% , 99% CI)
Type of practice			
Rural	176 (48.0, 41.3–54.7)	126 (34.3, 28.3–41.0)	117 (32.0, 26.0–38.5)
Urban	258 (40.1, 35.3–45.2)	240 (37.3, 32.6–42.4)	208 (32.4, 27.8–37.3)
Mixed	157 (42.4, 36.0–49.1)	124 (33.4, 27.4–40.0)	115 (31.0, 25.2–37.5)
<i>P</i> -value	0.053	0.396	0.899
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (significant two-way effects)	Bu and It greater if rural	It greater if rural; Sw smaller if urban	It, Sp and Tu greater if rural; Gr smaller if rural
Hours of sleep			
>8	71 (37.0, 28.6–46.3)	57 (29.7, 22.0–38.8)	61 (31.8, 23.8–40.9)
≤8	527 (44.2, 40.5–47.9)	433 (36.3, 32.8–40.0)	380 (31.9, 28.5–35.5)
<i>P</i> -value	0.060	0.076	0.970
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (significant two-way effects)	None statistically significant	Tu greater if >8	None statistically significant
Night visits			
Yes	305 (43.3, 38.5–48.1)	265 (37.6, 33.0–42.4)	216 (30.7, 26.4–35.3)
No	291 (43.0, 38.2–48.0)	219 (32.4, 27.9–37.2)	219 (32.4, 27.9–37.2)
<i>P</i> -value	0.936	0.043*	0.493
Cramer's <i>V</i>		0.054	
One-way effect	None statistically significant	Greater proportion if yes	None statistically significant
Controlling for country (significant two-way effects)	Tu greater if yes; UK if no	None	None statistically significant
Weekend shifts			
Yes	396 (43.2, 39.0–47.4)	340 (37.1, 33.1–41.3)	263 (28.7, 25.0–32.7)
No	199 (43.3, 37.4–49.3)	141 (30.7, 25.4–36.4)	172 (37.4, 31.8–43.4)
<i>P</i> -value	0.978	0.018*	0.001**
Cramer's <i>V</i>		0.064	0.088
One-way effect	None statistically significant	Greater proportion if yes	Greater proportion if no
Controlling for country (significant two-way effects)	Tu greater if yes	Tu, as above	It and Sp greater if no; Tu if yes
Sick leave			
0 days	316 (37.9, 33.7–42.3)	261 (31.3, 27.35–35.6)	249 (29.9, 26.0–34.1)
1–2 days	68 (52.3, 41.2–63.2)	54 (41.5, 31.1–52.8)	37 (28.5, 19.5–39.5)
3 days or more	143 (50.2, 42.6–57.7)	114 (39.9, 32.7–47.5)	111 (38.9, 31.8–46.6)
<i>P</i> -value	<0.0005**	0.006**	0.012*
Cramer's <i>V</i>	0.124	0.091	0.084
One-way effect	Smaller proportion if 0 days	Smaller proportion if 0 days	Greater proportion if ≥3 days
Controlling for country (significant two-way effects)	It greater if 0; Fr, Tu, UK smaller if 0	It greater if 0	Fr and It, as above
Changing job			
Yes	298 (66.4, 60.45–71.8)	212 (47.1, 41.1–53.2)	190 (42.3, 36.5–48.4)
No	248 (29.7, 25.8–33.9)	244 (29.2, 25.3–33.4)	222 (26.6, 22.8–30.7)
Undecided	51 (48.6, 36.5–60.9)	35 (33.3, 22.8–45.9)	33 (31.4, 21.1–43.9)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Cramer's <i>V</i>	0.341	0.172	0.155

TABLE 5a *Continued*

Categorical variables	EE high burnout, <i>n</i> (% , 99% CI)	DP high burnout, <i>n</i> (% , 99% CI)	PA high burnout, <i>n</i> (% , 99% CI)
One-way effect	Greater proportion if yes; smaller proportion if no	Greater proportion if yes; smaller proportion if no	Greater proportion if yes, smaller proportion if no
Controlling for country (significant two-way effects)	All except Gr, as above	Bu, Fr, Hu, It, Mt, Sw and UK, as above	Fr, Hu, Tu and UK, as above
Satisfaction			
High (5–6)	78 (18.8, 14.4–24.2)	97 (23.4, 18.5–29.1)	66 (15.9, 11.8–21.1)
Moderate (3–4)	359 (50.1, 45.3–54.9)	277 (38.6, 34.1–43.4)	255 (35.7, 31.2–40.4)
Low (0–2)	127 (61.4, 52.4–69.6)	98 (47.3, 38.6–56.2)	98 (47.3, 38.6–56.2)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Cramer's <i>V</i>	0.326	0.178	0.240
One-way effect	Greater proportion if low or moderate, smaller proportion if high	Greater proportion if low, smaller proportion if high	Greater proportion if low, smaller proportion if high
Controlling for country (significant two-way effects)	All, as above	Fr, It, Mt, Po, Sw, Tu and UK, as above	Hu, It, Mt, Po, Sw, Tu and UK, as above
Smoking			
Yes	90 (44.8, 36.0–53.8)	76 (37.8, 29.5–46.9)	79 (39.3, 30.9–48.4)
No	497 (43.1, 39.4–46.9)	387 (33.6, 30.1–37.3)	332 (28.8, 25.5–32.4)
<i>P</i> -value	0.666	0.245	0.003**
Cramer's <i>V</i>			0.081
One-way effect	None statistically significant	None statistically significant	Greater proportion if yes
Controlling for country (significant two-way effects)	None statistically significant	None statistically significant	It, as above
Increasing smoking			
Yes	41 (64.1, 48.0–77.5)	31 (48.4, 33.2–63.9)	22 (34.4, 21.2–50.5)
No	45 (34.9, 25.0–46.2)	41 (31.8, 22.3–43.0)	50 (38.8, 28.5–50.1)
<i>P</i> -value	0.001**	0.043*	0.029*
Cramer's <i>V</i>	0.106	0.068	0.063
One-way effect	Greater proportion if yes	Greater proportion if yes	Greater proportion if no
Controlling for country (significant two-way effects)	It and Sp, as above	None statistically significant	It and Tu, as above
Alcohol			
Yes	196 (50.8, 44.3–57.3)	166 (43.0, 36.7–49.6)	111 (28.8, 23.2–35.0)
No	394 (40.7, 36.7–44.8)	299 (30.9, 27.2–34.8)	300 (31.0, 27.3–34.9)
<i>P</i> -value	0.001**	<0.0005**	0.419
Cramer's <i>V</i>	0.092	0.115	
One-way effect	Greater proportion if yes	Greater proportion if yes	None statistically significant
Controlling for country (significant two-way effects)	Hu and Mt greater if no; It if yes	Tu, as above	None statistically significant
Increasing alcohol			
Yes	58 (79.5, 65.1–88.9)	46 (63.0, 47.9–75.9)	23 (31.5, 19.5–46.6)
No	133 (43.6, 36.5–51.0)	114 (37.4, 30.6–44.7)	82 (26.9, 20.9–33.9)
<i>P</i> -value	<0.0005**	<0.0005**	0.380
Cramer's <i>V</i>	0.176	0.157	
One-way effect	Greater proportion if yes	Greater proportion if yes	None statistically significant
Controlling for country (significant two-way effects)	Hu, Fr, It, Mt, Tu and UK, as above	Fr as above	None statistically significant

TABLE 5a Continued

Categorical variables	EE high burnout, <i>n</i> (% , 99% CI)	DP high burnout, <i>n</i> (% , 99% CI)	PA high burnout, <i>n</i> (% , 99% CI)
Psychotropic drugs			
Yes	130 (65.0, 55.9–73.1)	89 (44.5, 35.8–53.6)	76 (38.0, 29.7–47.1)
No	457 (39.7, 36.1–43.5)	373 (32.4, 29.0–36.1)	331 (28.8, 25.5–32.3)
<i>P</i> -value	<0.0005**	0.001**	0.009**
Cramer's <i>V</i>	0.181	0.091	0.071
Controlling for country (significant two-way effects)	Greater proportion if yes; Fr, It, Po, Sw, Tu and UK, as above	Greater proportion if yes; Fr, as above	Greater proportion if yes Tu, as above

N, proportion (%) of respondents with high burnout and 99% CI (to correct for multiple comparisons; *except* for the control variable 'country') in brackets, *P*-value for the statistical significance of a one-way association, Cramer's *V* for significant one-way associations, text description of statistically significant one-way trends and text description of associations found to be statistically significant (*P* ≤ 0.05) when controlling for country (where applicable) are tabulated.

*Significant to an α -value of 0.05.

**Significant to an α -value of 0.01. Recommended minimum α level for multiple comparisons.

would only have achieved enough power to measure the projected differences if the rate of burnout was considerably lower. Additionally, the effect of non-response was not fully considered. The responses from the various European countries were pooled together in the one-way analyses of association; if the variability of burnout rates within the countries is less than that between countries, then an α -value of 0.05 may be too large to exclude associations due to chance.²⁹

Multicollinearity is present when the independent variables in a multiple regression equation are highly correlated, and this causes a lack of precision of the regression coefficient estimates (here expressed as odds ratios in Table 6). During the logistic regression analysis, interfactor correlation was examined, and in fact, there was only one correlation greater than 0.6, that between age and years since graduation (0.9, data not tabulated).

This is the first reported study investigating the prevalence of burnout in an European FD workforce, designed to investigate the factors associated with high burnout. The limitations of this study include the fact that it is cross-sectional, that it has not been conducted concurrently in all countries, that the cultural and linguistic equivalence of the concept of burnout and the MBI-HSS instrument itself have not been fully investigated in Europe and that the study involved FDs in various European countries and working in different health care systems without measuring the complexity of this environment. The response rate was moderate, but it is quite possible that non-respondents might have scored differently to respondents to the MBI-HSS. However, similar response rates are common in anonymous questionnaire studies. The burnout scores found appeared comparable or high with respect to earlier studies. However, the Italian respondents in this study, which response rate was the highest in this study, scored very high for burnout, suggesting that non-responders may also have high levels of burnout.

Conclusions

Burnout seems to be a common problem in FDs across Europe, with high levels apparently affecting two-thirds of respondents in this study. In all, 41% of respondents reported high levels of EE, 35% DP and 32% low feelings of PA. There is considerable variation between countries, with doctors from Southern European countries reporting lower rates of EE but also lower feelings of PA.

High burnout was found to be more likely in association with several of the variables under study, especially those relative to respondents' country of residence and European region, job satisfaction, intention to change job, sick leave utilization, the (ab)use of alcohol, tobacco and psychotropic medication, younger age and male sex.

TABLE 5b *The associations between continuous variables and the three burnout outcome variables (high burnout in each of the three dimensions) explored using the independent samples t-test, one-way ANOVA or two-way ANOVA F-tests, as appropriate*

Continuous variables	EE burnout mean (99% CI)	DP burnout mean (99% CI)	PA burnout mean (99% CI)
Age			
BO high	46.1 (45.3–46.9)	45.4 (44.5–46.4)	44.7 (43.7–45.8)
BO not high	44.9 (44.1–45.8)	45.4 (44.7–46.2)	45.8 (45.1–46.5)
P-value	0.011*	0.953	0.030*
One-way effect	Greater mean with high BO	None statistically significant	Smaller mean with high BO
Controlling for country (two way)			
P-value for interaction	<0.0005**	0.002**	n.s.
P-value for main effect	n.s.	0.001**	n.s.
Effect	Varies	Mostly smaller mean with high BO	
Number of children			
BO high	1.9 (1.8–2.0)	1.9 (1.7–2.0)	1.6 (1.5–1.8)
BO not high	1.8 (1.7–1.9)	1.8 (1.7–1.9)	1.9 (1.8–2.0)
P-value	0.106	0.495	<0.0005**
One-way effect	None statistically significant	None statistically significant	Smaller mean with high BO
Controlling for country (two way)			
P-value for interaction	n.s.	n.s.	n.s.
P-value for main effect	n.s.	n.s.	n.s.
Years since graduation			
BO high	19.9 (19.0–20.7)	19.1 (18.2–20.1)	18.7 (17.7–19.8)
BO not high	18.8 (18.0–19.6)	19.3 (18.6–20.1)	19.5 (18.8–20.2)
P-value	0.016*	0.681	0.108
One-way effect	Greater mean with high BO	None statistically significant	None statistically significant
Controlling for country (two way)			
P-value for interaction	n.s.	0.002**	n.s.
P-value for main effect	n.s.	0.001**	n.s.
Effect		Mostly smaller mean with high BO	
Years in current job			
BO high	12.6 (11.7–13.5)	12.8 (11.8–13.8)	11.7 (10.6–12.9)
BO not high	11.9 (11.1–12.8)	11.9 (11.1–12.7)	12.5 (11.7–13.2)
P-value	0.182	0.087	0.164
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (two way)			
P-value for interaction	n.s.	n.s.	n.s.
P-value for main effect	n.s.	n.s.	n.s.
Patients per week			
BO high	160 (151–169)	150 (141–159)	148 (138–159)
BO not high	146 (138–154)	153 (145–160)	153 (146–160)
P-value	0.003*	0.605	0.330
One-way effect	Greater mean with high BO	None statistically significant	None statistically significant
Controlling for country (two way)			
P-value for interaction	0.0005**	0.0005**	n.s.
P-value for main effect	0.0005**	0.017*	n.s.
Effect	Mostly greater mean with high BO	Varies	
Hours per week			
BO high	47.5 (45.9–49.0)	47.2 (45.7–48.7)	44.7 (42.9–46.5)
BO not high	44.8 (43.5–46.0)	45.2 (44.0–46.5)	46.5 (45.3–47.7)
P-value	0.001**	0.013*	0.029*
One-way effect	Greater mean with high BO	Greater mean with high BO	Smaller mean with high BO
Controlling for country (two way)			
P-value for interaction	0.009**	n.s.	n.s.
P-value for main effect	0.0005**	n.s.	n.s.
Effect	Mostly greater mean with high BO		
Nights per month			
BO high	2.4 (2.0–2.8)	2.8 (2.4–3.2)	2.6 (2.1–3.1)
BO not high	2.2 (1.9–2.5)	2.0 (1.7–2.3)	2.1 (1.9–2.4)
P-value	0.191	<0.0005**	0.019*
One-way effect	None statistically significant	Greater mean with high BO	Greater mean with high BO
Controlling for country (two way)			
P-value for interaction	n.s.	0.004**	n.s.
P-value for main effect	n.s.	0.001**	n.s.
Effect		Mostly greater mean with high BO	
Weekends off per annum			
BO high	33 (31–35)	32.3 (30.2–34.4)	31.3 (28.9–33.9)
BO not high	32 (30–33)	32.1 (30.3–33.8)	32.5 (31.0–34.0)
P-value	0.165	0.804	0.293

TABLE 5b *Continued*

Continuous variables	EE burnout mean (99% CI)	DP burnout mean (99% CI)	PA burnout mean (99% CI)
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (two way)			
<i>P</i> -value for interaction	0.0005**	n.s.	0.0005**
<i>P</i> -value for main effect	n.s.	n.s.	n.s.
Effect	Varies		Varies
Income—median income/IPC			
BO high	13.5% (2.1–24.8%)	13.1% (1.4–24.8%)	10.7% (0–25.7%)
BO not high	5.2% (0–12.7%)	6.3% (0–15.9%)	8.1% (0–16.4%)
<i>P</i> -value	0.155	0.262	0.666
One-way effect	None statistically significant	None statistically significant	None statistically significant
Controlling for country (two way)			
<i>P</i> -value for interaction	0.0005**	n.s.	0.010*
<i>P</i> -value for main effect	0.002**	0.04*	n.s.
Effect	Varies	Greater mean with high BO	Varies

n.s., not significant; ANOVA, analysis of variance. The mean, 99% CI (to correct for multiple comparisons) and *P*-value of the test of difference in means for the distribution of each variable in each of the categories of the three main outcome variables are tabulated. The two-way ANOVA *F*-test with Bonferroni correction analysis is summarized textually as such: *P*-value for the interaction effect of country and burnout category if significant ($\alpha \leq 0.05$), *P*-value for the main effect of burnout high/not high if significant ($\alpha \leq 0.05$) and a text description of the observed graphical trend for different countries.

*Significant to an α -value of 0.05.

**Significant to an α -value of 0.01. Recommended minimum α level for multiple comparisons.

Future research is needed to explore the problem in depth, develop models to describe the phenomenon and to identify causative factors and effective intervention strategies. Job satisfaction is an important element in such research, and it should be prioritized by EGPRN and WONCA Europe as an action point for research and intervention.

Future research

Recent research work on burnout aims to develop new theoretical frameworks that explicitly integrate both individual and situational factors, using a model of job–person fit. Maslach and Leiter³⁰ address the challenge by formulating a model that focuses on the degree of match or mismatch between the person and six domains of the job environment, namely workload, control, reward, community, fairness and values. Research has indicated that the greater the mismatch, the greater the potential for burnout.

Future research into the phenomenon should address these factors when studying burnout in FDs, and the focus should be on positive rather than negative states, dealing with job engagement and satisfaction and not just job stress.¹ In this regard, the strong relationships found in this study between low job satisfaction and burnout support the notion of focusing future research on improving job satisfaction rather than addressing burnout directly.

Surprisingly, little research has been conducted into interventions for burnout. Although research indicates that it is the organizational attributes that seem to have stronger associations with burnout, most interventions

have in the past ironically been centered on changing individuals.¹ Various intervention strategies have been studied, some focusing on prevention of burnout and others on treatment when it has already occurred, and results have been varied.¹ This is another important area where levels of knowledge should improve. A controlled trial of organizational interventions for FDs to improve job satisfaction should be considered.

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TABLE 6 Logistic regression analysis, controlling for country

Variable	EE high burnout, odds ratio (95% CI)	DP high burnout, odds ratio (95% CI)	PA high burnout, odds ratio (95% CI)
Intercept	-4.32	-2.99	-0.19
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Sex			
Female	1.00 reference	1.00 reference	1.00 reference
Male	1.05 (1.01–1.10)	1.83 (1.77–1.89)	1.71 (1.63–1.79)
<i>P</i> -value	0.031*	<0.0005**	<0.0005**
Marital status			
Single	1.00 reference		1.00 reference
Married	1.08 (1.04–1.12)		0.79 (0.75–0.83)
Divorced–separated	1.10 (0.99–1.22)		0.97 (0.85–1.10)
<i>P</i> -value	0.179		0.003**
Children under 5			
0			1.00 reference
1			0.86 (0.81–0.92)
2			0.72 (0.56–0.92)
<i>P</i> -value			0.019*
Further qualifications			
No	1.00 reference		1.00 reference
Yes	0.60 (0.58–0.62)		1.58 (1.52–1.64)
<i>P</i> -value	<0.0005**		<0.0005**
Type of work (first choice)			
Public	1.00 reference	1.00 reference	1.00 reference
Private	1.51 (1.43–1.59)	1.51 (1.49–1.63)	0.84 (0.79–0.89)
Academic	0.07 (0.07–0.08)	0.43 (0.41–0.44)	1.94 (1.82–2.08)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Setting			
Solo		1.00 reference	
Group		1.34 (1.28–1.41)	
<i>P</i> -value		<0.0005**	
Type of practice			
Urban	1.00 reference		
Rural	1.19 (1.12–1.27)		
Mixed	0.68 (0.64–0.73)		
<i>P</i> -value	<0.0005**		
Hours of sleep			
≤8	1.00 reference	1.00 reference	
>8	1.15 (1.08–1.22)	1.02 (0.96–1.08)	
<i>P</i> -value	<0.0005**	0.501	
Night visits			
No		1.00 reference	
Yes		0.85 (0.81–0.90)	
<i>P</i> -value		<0.0005**	
Weekend shifts			
No		1.00 reference	1.00 reference
Yes		1.33 (1.27–1.40)	1.01 (0.95–1.08)
<i>P</i> -value		<0.0005**	0.697
Sick leave			
0 days	1.00 reference	1.00 reference	1.00 reference
1–2 days	2.20 (2.06–2.35)	1.54 (1.48–1.60)	1.44 (1.35–1.55)
≥3 days	1.02 (0.96–1.08)	1.21 (1.17–1.26)	1.50 (1.42–1.60)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Changing job			
No	1.00 reference	1.00 reference	1.00 reference
Yes	3.36 (3.14–3.59)	1.70 (1.63–1.77)	1.08 (1.00–1.16)
Undecided	1.39 (1.31–1.47)	1.03 (0.99–1.08)	1.16 (1.08–1.24)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Satisfaction			
High (5–6)	1.00 reference	1.00 reference	1.00 reference
Low (0–2)	22.8 (21.1–24.7)	3.66 (3.48–3.86)	5.08 (4.54–5.67)
Moderate (3–4)	3.85 (3.63–4.10)	2.34 (2.22–2.47)	3.89 (3.47–4.29)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Increasing smoking			
No	1.00 reference	1.00 reference	1.00 reference
Yes	2.89 (2.61–3.20)	2.10 (1.95–2.27)	0.56 (0.49–0.64)

TABLE 6 Continued

Variable	EE high burnout, odds ratio (95% CI)	DP high burnout, odds ratio (95% CI)	PA high burnout, odds ratio (95% CI)
Non-smoker ^a	1.45 (1.37–1.54)	1.00 (0.94–1.06)	0.50 (0.46–0.54)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Increasing alcohol			
No	1.00 reference	1.00 reference	
Yes	2.94 (2.27–3.81)	2.09 (1.88–2.32)	
Non-drinker ^a	0.81 (0.75–0.88)	0.88 (0.83–0.93)	
<i>P</i> -value	<0.0005**	<0.0005**	
Psychotropic drugs			
No	1.00 reference	1.00 reference	1.00 reference
Yes	3.10 (2.83–3.39)	1.35 (1.28–1.42)	1.41 (1.30–1.52)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Age			
Per 10 years	0.59 (0.54–0.66)		0.84 (0.76–0.93)
<i>P</i> -value	<0.0005**		0.001**
Number of children			
Per child	0.96 (0.93–0.99)		0.91 (0.88–0.94)
<i>P</i> -value	0.002**		<0.0005**
Years since graduation			
Per 10 years	2.34 (2.13–2.68)		0.89 (0.80–1.00)
<i>P</i> -value	<0.0005**		0.048*
Years in current job			
Per 10 years	0.73 (0.70–0.75)	1.07 (1.05–1.10)	1.24 (1.20–1.29)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Patients per week			
Per 10 patients	1.02 (1.02–1.02)		
<i>P</i> -value	<0.0005**		
Hours per week			
Per 5 hours	1.05 (1.04–1.06)	0.97 (0.97–0.98)	0.92 (0.91–0.93)
<i>P</i> -value	<0.0005**	<0.0005**	<0.0005**
Nights per month			
Per night	1.01 (1.00–1.02)	1.07 (1.06–1.07)	0.99 (0.98–1.00)
<i>P</i> -value	0.011*	<0.0005**	0.003**
Weekends off per annum			
Per 12 weekends	1.03 (1.02–1.05)		
<i>P</i> -value	<0.0005**		
Income—median income/ IPC			
Per 10% change	1.00 (1.00–1.01)		
<i>P</i> -value	0.066		
Sample			
Cases (<i>n</i>)	681	1040	693
Excluded (<i>n</i>)	712	353	700
Model characteristics			
Pseudo -2 log likelihood	713.8	1194.0	734.8
Nagelkerke pseudo R^2	0.397	0.174	0.181
Classification			
Correctly classified high BO (%)	66.4	30.6	23.1
Correctly classified not high BO (%)	78.0	90.5	94.9
Correctly classified overall (%)	72.6	70.9	75.4

The three burnout outcome variables (high burnout in each of the three dimensions) as the dependent variable in each model, with selected questionnaire variables ($\alpha \leq 0.25$ in one-way analysis) as independent variables. Odds ratios, 95% CI and *P*-values (corrected for multiple comparisons using the sequential Bonferroni method) sample and model characteristics and classification.

^aInformation from another variable (tobacco or alcohol consumption) re-coded into this variable.

*Significant to an α -value of 0.05.

**Significant to an α -value of 0.01.

TABLE 7 Descriptive analysis of previously published studies of burnout in FDs or primary care doctors compared with the EGPRN study

Population	Authors and year	Burnout rates	Comparable EGPRN study data	Comparison	Limitations of comparison
Switzerland, Swiss primary care doctors	Goehring <i>et al.</i> ⁸ published 2005	High EE burnout in 19%; high DP burnout in 22%; high PA burnout in 16%	High EE burnout in 43.0% (95% CI = 40.5–45.6%), high DP burnout in 35.3% (32.9–37.9%), high PA burnout in 32.0% (29.6–34.5%).	Lower rates of burnout reported	Only a third of the respondents in this study were FDs. There was no Swiss arm in the EGPRN study. Comparisons of Swiss data are against EGPRN global study rates.
France, French FDs	Cathebras <i>et al.</i> ²³ published 2004	5% scored high in all three dimensions	10% of French respondents scored high in all three dimensions (95% CI 6–15%)	Lower rate of burnout reported	
Spain, Spanish primary care doctors	Prieto Albino <i>et al.</i> ²⁴ published 2002	66% scored high in at least one dimension	55% of Spanish respondents scored high in at least one dimension (95% CI 44–65%)	Comparable rate of burnout reported	Not all respondents were FDs
Spain, Spanish FDs and paediatricians	Esteva <i>et al.</i> ²⁵ published 2006	High EE burnout in 53%; high DP burnout in 47%; high PA burnout in 33%	30% of Spanish respondents scored high for EE burnout (95% CI 22–40%); 35% for DP (26–45%); 26% for PA (18–36%)	Higher rate of EE burnout and DP burnout and comparable rate of PA burnout reported	Not all respondents were FDs
Italy, Italian FDs	Grassi and Magnani ²⁶ published 2000	High EE burnout in 32%; high DP burnout in 27%; high PA burnout in 13%	68% of Italian respondents scored high for EE burnout (95% CI 60–75%); 55% for DP (47–63%); 41% for PA (33–49%)	Lower rates of burnout reported	
Canada, Canadian FDs	Thommasen <i>et al.</i> ⁹ published 2001	Moderate to high EE burnout in 80%; moderate to high DP burnout in 61%; moderate to high PA burnout in 44%	83.0% of all respondents scored moderate to high for EE burnout (95% CI 81.0–84.9%); 62.5% for DP (60.0–65.0%); 60.5% for PA burnout (57.9–63.0%)	EE and DP rates comparable, lower PA burnout reported	Comparison of European and Canadian data
Britain, British FDs	Kirwan and Armstrong ²⁷ published 1995	Mean score of 26.1 for EE; 9.8 for DP; 36.2 for PA	Mean scores for English respondents were 27.2 for EE; 9.5 for DP; 36.3 for PA	Comparable scores reported	Study in mid-1990s
Europe, European FDs	Yaman and Soler ¹⁷ published 2002	Mean score of 25.1 for EE; 7.3 for DP; 34.5 for PA	Mean scores for respondents were 25.2 for EE; 8.2 for DP; 36.7 for PA	Comparable scores reported	

provided data, participated in the design of the questionnaire and participated in writing the manuscript; CL provided data, participated in the design and translation of the questionnaire and participated in writing the manuscript; RSA, Z de ASA, FC, JPD, MK, PK, ZO, AM, EM, PRN and MU provided data and participated in the design and translation of the questionnaire.

Declaration

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Conflicts of interest: None.

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