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BURNED-OUT BUT PROUD PORTUGUESE FAMILY DOCTORS: A CROSS-SECTIONAL SURVEY

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BURNED-OUT BUT PROUD PORTUGUESE FAMILY DOCTORS

A CROSS-SECTIONAL SURVEY

Short title: Burnout in Portuguese Family Doctors

Gisela Marcelino* [1]; João Melich-Cerveira* [1]; Inês Carvalho[1]; João Azeredo Costa[1]; Marta Lopes[1]; Nelson Calado[2] and Pedro Marques-Vidal [3,4]

[1] Medical Faculty of Lisbon, University of Lisbon, Avenida Professor Egas Moniz, 1649-028 Lisbon, Portugal; [2] Alvalade Health Center, Av. do Brasil, 53, Pavilhão 33, Parque de Saúde de Lisboa, Lisbon, Portugal; [3] Institute of Social and Preventive Medicine (IUMSP), University Hospital of Lausanne, Route de la Corniche 2, 1066 Epalinges, Switzerland;

* Both authors contributed equally

Emails of authors:

Gisela Marcelino (GM): giselamarcelino@sapo.pt

João Melich-Cerveira (JMC): joao_cerveira86@hotmail.com

Inês Carvalho (IC): inesdcarvalho@gmail.com

João Azeredo Costa (JAC): j.azeredo.costa@gmail.com

Marta Lopes (ML): msclopes13@gmail.com

Nelson Calado (NC): caladonelson@yahoo.com.br

Pedro Marques-Vidal (PMV): pedro-manuel.marques-vidal@chuv.ch

Address for reprints and correspondence

Gisela Marcelino

Praça Artur Portela

2, 1º esquerdo

1500-061, Lisboa

Tel: + 351969911416

E-mail: giselamarcelino@sapo.pt

We state that Gisela Marcelino and João Melich-Cerveira, having contributed equally, were responsible for the conception, design, and acquisition of data. They both

worked statistically the data, and wrote the article. We also state that Pedro Marques-Vidal was the tutor of this research study and wrote part of the article. Inês Carvalho, João Azeredo Costa and Marta Lopes helped with the acquisition of data and, along with Nelson Calado, scientifically reviewed the paper and made major modifications regarding intellectual content. All authors have given their final approval of the version to be submitted.

We state that there is no conflict of interest for all authors.

We state that that the manuscript, including related data, figures and tables have not been previously published, that the manuscript is not under consideration elsewhere, and that there is no additional data available.

We also state that this study did not receive any funding, and that it was approved by the Ethics Commissions of North, Algarve, and Madeira, and also by all Portuguese Regional Administrations.

Abstract + main text: 1881

Number of tables: 3 **Number of figures: 1** **Number of references: 17**

Abstract

Aim: To characterize the prevalence of burnout syndrome (BS) in a sample of FDs working in the Portuguese National Health System.

Design: Cross-sectional survey.

Setting: Primary Health Care Centers (HCC) from the 18 continental districts and 2 archipelagos of Portugal.

Method: The Portuguese version of the Maslach Burnout Inventory–Human Services Survey (MBI–HSS) was sent to 40 randomly selected health-care centers (HCC) and distributed to the FDs employed. Socio-demographic and work-related data was also collected. Participants were classified as having high, average or low levels of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) dimensions of burnout.

Results: 371 questionnaires were sent, of which 153 (83 women, age range 29-64 years; response rate 41%) returned. One quarter (25.3%) of FDs scored high for emotional exhaustion (EE), 10.0% for depersonalization (DP) and 12.0% for lack of personal accomplishment (PA). In comparison with women, men scored higher in all the three subscales: EE (median [interquartile interval]: 14.5 [16.3] vs. 17.0 [22.0], respectively, *P*-value not significant), DP (3.0 [5.8] vs. 6.0 [6.8], $P < 0.05$), and PA (40.0 [8.0] vs. 42.5 [8.0] $P < 0.05$). Increasing working hours per day also led to higher PA scores ($P < 0.05$). The prevalence of burnout ranged between 2.0% and 27.7%, depending on the definition used.

Conclusion: High burnout is relatively common among Portuguese family doctors, yet lower than reported for other European countries. Burnout relief measures should be developed in order to prevent a further increase of BS among Portuguese FDs.

Key Words: Burnout, Portugal, family doctors, MBI-HSS.

Article Focus: In the last three decades, BS increased to worrisome levels in doctors, including FDs, and there is scarce data concerning this condition in Portuguese FDs.

Key Messages: The prevalence of burnout ranged between 2.0% and 27.7%, depending on the definition used; but still, Portuguese FDs feel rewarded by their job.

Strengths and Limitations: This is, as far as we know, the first study ever on BS in Portuguese FDs. The questionnaire MBI-HSS hadn't been validated in Portugal at the time of the study; still, Cronbach's α values ranged between 0.64 (for DP) and 0.90 (for EE), also in agreement with literature.

Introduction

In the last three decades, burnout syndrome increased to worrisome levels in doctors [1, 2], including family doctors (FD)[3]. Despite the presence of burnout most family doctors usually do not seek help[4], which might lead to a decrease in their performance and even compromise adequate treatment of patients.

Burnout is consequent to job-related chronic stress[5] and is characterized by a symptomatic triad of emotional exhaustion (EE) (feelings of tiredness and emptiness), depersonalization (DP) (empathy disappearance, cynicism and automatism) and a lack of personal accomplishment (PA) (lack of self-esteem and frustration)[5].

In 2008, a European study on burnout among European family doctors (the EGPRN study[3]) showed that 43% of respondents scored high for EE burnout, 35% for DP and 32% for PA, with 12% scoring high burnout in all three dimensions. Unfortunately, the EGPRN study did not include Portugal, so we conducted a study to assess the prevalence of burnout among Portuguese FDs, using the same methodology as the EGPRN.

Method

This study was conducted between November 2010 and November 2011. A stratified and randomized sampling was conducted selecting 2 primary health care centers (HCC) from each of the 18 Portuguese continental districts and 2 archipelagos (Madeira and Azores) of Portugal as described in the site “Portal da Saúde” from the Portuguese Ministry of Health[6]. Questionnaires were sent with pre-paid return envelopes to previously contacted HCC employees, who distributed the questionnaires

with informed consent to every FD employed. 17 questionnaires were sent and received via e-mail.

FDs in HCCs work in either Family Health-Care Units (FHCU) or Personalized Health-Care Units (PHCU). The first provides health-care to families, while the second provides health-care to individuals in general. Burnout was assessed using the Portuguese translation of the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)[4]. Answers to the MBI-HSS were used to classify the participants as having high, average or low levels in EE, DP and PA dimensions of burnout. The following cut-offs were used to define low, average of high levels of each dimension of the MBI-HSS: EE: low, ≤ 16; average, 17-26; high; ≥27; DP: low, ≤6; average, 7-12; high, ≥13; PA: low, ≥ 39; average, 32-38; high, ≤ 31 [7]. As the definition of burnout is a controversial subject, we applied different definitions as described in the literature: 1) high levels of EE and DP, combined with low PA [8, 9]; 2) high EE and/or high DP[10, 11] and 3) high negative score on EE in combination with high DP or low PA [12]. The study was approved by the Ethics Commissions of North, Algarve, and Madeira, and also by all Portuguese Regional Administrations.

Statistical analysis was performed using SPSS v. 17.0 (IBM SPSS statistics, Armonk, NY, USA). Results were expressed as median [interquartile interval], mean ± standard deviation, or number of subjects (percentage). Comparisons were performed using Mann-Whitney or Kruskall-Wallis nonparametric tests for quantitative data and by chi-square for qualitative data. Multivariate analysis was conducted using logistic regression. Results were considered significant if P <0.05. As to missing data, for each skipped MBI-HSS item, it was attributed the mean score calculated for that question's

dimension. Two skipped questions were coded as missing value for the whole dimension. Two answers for the same item were coded as one skipped question and replaced by the average of that dimension.

Results

Overall, **371** questionnaires were sent, of which 153 (response rate 41%) were retrieved. From these, only 150 were considered valid for the analysis. The main results are summarized in **table 1**. Men were older and had more years of professional activity than women. Overall, 25.3% of participants scored high for EE, 10.1% for DP and 12.0% for PA; 2.0% scored high for all three dimensions. Men scored higher DP and PA than women, while no differences were found for EE (**table 1**). No significant bivariate association was found between burnout scores and age, years of practice, hours spent at the primary care center per week, practice unit, and if working in more than one institution (not shown – supplementary table 1 for reviewing purposes only). In contrast, having children was related to increasing DP scores (P <0.05), and being married or in civil union with increasing EE scores (P <0.05).

Finally, multivariate logistic regression including gender, age, marital status, if having any children or not, years of professional activity, number of hours of work per week, number of hours in contact with patients per day, practice unit, and if working in any other institution, was performed according to the different definitions of burnout. Increased risk for burnout was obtained for people working in Personalized (odds of 3.62, P <0.05) relative to Family Health Care Units and also for increasing years of

professional activity (odds of 1.69, *P* <0.05), when considering burnout as, respectively, high EE and/or high DP or high score on EE in combination with high DP or low PA.

In **table 3** it is evident that Portugal FDs are comparatively in a more favorable situation. Participants scoring at least high and at least average in one dimension were 33.0% and 53.5%, respectively; and 31.1% scored exclusively low in each dimension (*see* **table 2**).

Discussion

To our knowledge, this is the first study ever to assess rates of burnout among FDs in Portugal. Our study also complements the previous findings of the EGPRN study[3], which assessed burnout among FDs from 12 European countries. The main finding is that in Portugal, in overall, FDs have low levels of burnout for the three subscales EE, DP and PA. In relation to each gender, men have higher symptoms of burnout, but since they are significantly older and have more years of professional activity than women, this might be an explanation for the different results.

The prevalence of burnout ranged from 2.0% to 27.7%, depending on the definition used. This wide range is due to the different combinations of EE, DP and PA subscales, as indicated in **figure 1** [8-12]. Hence, it would be of interest that studies on burnout report their results using one or several definitions, or as suggested in figure 1, in order to facilitate comparisons with the literature. Finally, if burnout is considered as a continuous process, the majority of FDs is at risk, although with different grades of risk (between 41.2% - 66.9%, considering the previous definitions of burnout and excluding those who have low burnout symptoms in the three subscales), as shown in

table 2. The Portuguese FDs had lower burnout scores than FDs from other European countries (*see* **table 3**). A possible explanation might be related to a slightly lower workload among Portuguese FDs compared to their colleagues from other countries. For instance, Portugal has 198.3 FDs per 100,000 inhabitants, a much higher number in comparison with the United Kingdom, which has only 78.3 FDs per 100,000[13]. Further, a Portuguese FD has on average 1500[14] patients, again a value lower than in the UK (1800)[15]. Another possible explanation is that Portuguese FDs consider their job as very demanding, but very rewarding at the same time, as reflected by a lower prevalence of bad PA among men who have higher levels of EE and DP, in comparison to women, and also, by increasing significant (P <0.05) PA scores with increasing working hours per day (not shown – supplementary table 1 for reviewing purposes only). Still, further studies are advisable to better understand the low burnout prevalence and scores among Portuguese doctors relative to their European counterparts.

This study has some limitations worth noting. First the response rate (41%) was rather low, but identical to the one reported by the EGPRN study[3]. The questionnaire MBI hadn't been validated in Portugal at the time of the study; still, Cronbach's α values ranged between 0.64 (for DP) and 0.90 (for EE), also in agreement with those reported in the EGPRN study[3]. Finally, only FDs present at the HCCs answered, thus excluding those on sick leave; hence, it is possible that the burnout rates reported are underestimated. Still, in the absence of other studies available, our results provide the first estimation of the burnout rates among FDs in Portugal. The results of our study have important implications. In Portugal, there is currently no aid for dealing with

burnout among health professionals. Hence, it would be of uttermost importance that the Portuguese Ministry of Health, the Portuguese College of Physicians or the Regional Health Administrations provide some support at institutional and individual levels. Finally, another study would be desirable to assess the progression of burnout among Portuguese FDs.

In summary, our results suggest that a significant percentage of Portuguese FD present with burnout. These values are nevertheless lower than reported in other European countries.

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Table 1 – Main characteristics of the participants.

Variables	All	Male	Female	*Test*
Age	54.5 [9.0] (*n* = 148)	55.0 [5.0] (*n* = 67)	53.0 [13.0] (*n* = 81)	1813.0***
Years of professional activity	29.0 [10.3] (*n* = 150)	30.0 [4.0] (*n* = 67)	28.0 [5.0] (*n* = 83)	2103.0*
Hours of work per week	42.0 [3.0] (*n* = 150)	42.0 [3.4] (*n* = 68)	42.0 [2.0] (*n* = 82)	2744.0 ns
Hours of contact with patients per day	7.0 [1.5] (*n* = 138)	7.0 [1.6] (*n* = 61)	7.0 [1.6] (*n* = 77)	2201.0 ns
Emotional exhaustion score	16.0 [19.0]	17.0 [22.0]	14.5 [16.3]	2584.5 ns
High emotional exhaustion score	38 (25.3) (*n* = 150)	21 (30.9) (*n* = 68)	17 (20.7) (*n* = 82)	2.08 ns
Depersonalization score	4.0 [5.0]	6.0 [6.8]	3.0 [5.8]	2078.0*
High depersonalization score	15 (10.1) (*n* = 148)	10 (14.7) (*n* = 68)	5 (6.3) (*n* = 80)	3.52 ns
Personal Accomplishment score	41.0 [8.0]	42.5 [8.0]	40.0 [8.0]	2206.0*
Low personal accomplishment score	18 (12.0) (*n* = 150)	6 (8.8) (*n* = 68)	12 (14.6) (*n* = 82)	4.28 ns
Burnout §	3 (2.0) (*n* = 148)	2 (2.9) (*n* = 68)	1 (1.3) (*n* = 80)	NA
Burnout §§	41 (27.7) (*n* = 148)	22 (32.4) (*n* = 68)	19 (23.8) (*n* = 80)	1.36 ns
Burnout §§§	18 (12.2) (*n* = 148)	9 (13.2) (*n* = 68)	9 (11.3) (*n* = 80)	0.14 ns

Results are expressed as median [interquartile interval] or number (percentage) of the total subjects. Comparisons performed with Mann-Whitney nonparametric test for quantitative data and by chi-square for qualitative data: NA, not accessible for statistical analysis. NS, not significant. *, p <0.05. **, p <0.01, ***, p <0.001. Burnout defined as § high levels of EE and DP, combined with low PA; §§ high EE and/or high DP and §§§ high score on EE in combination with high DP or low PA.

Table 2 – Number of participants with low, average and high burnout scores in none, one, two or three subscales.

	High Burnout				
	0	1	2	3	Total
Average burnout					
0	46 (31.1)	15 (10.1)	5 (3.4)	3 (2.0)	69 (46.6)
1	39 (26.4)	14 (9.5)	10 (6.8)	-	63 (42.6)
2	12 (8.1)	2 (1.4)	-	-	14 (9.5)
3	2 (1.4)	-	-	-	2 (1.4)
Total	99 (66.9)	31 (20.9)	15 (10.1)	3 (2.0)	148 (100)

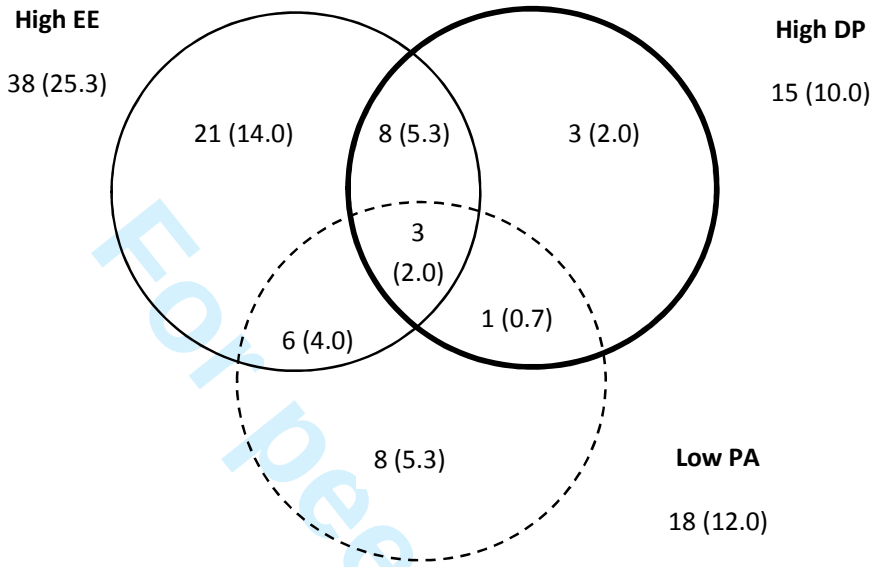
The possible combinations for the different subscales describing increasing burnout are shown in the table. Participants with low burnout scores in one dimension are represented by excluding average or high burnout. Results are expressed as number (percentage) of the total subjects.

Table 3 – Results for each burnout subscale in previous and recent European studies.

European Studies	**EE**	**DP**	**PA**
EGPRN study, Overall (2008, *n* = 1393)[3]	24.0 ± 16.0	7.0 ± 7.0	37 ± 11.0
Spanish FDs [1] (2005, *n* = 86)[16]	27.4 ± 11.8	10.07 ± 6.4	35.9 ± 10.07
Swiss FDs (2002, *n* = 1755)[17]	17.9 ± 9.8	6.5 ± 4.7	39.6 ± 6.5
EGPRN study (2008)[3]	**High EE (%)**	**High DP (%)**	**Low PA (%)**
Overall (*n* = 1393)	43.0	35.3	32.0
Bulgaria (*n* = 69)	62.3	30.4	18.8
Croatia (*n* = 117)	41.9	12.0	13.7
France (*n* = 178)	33.7	35.4	27.5
Greece (*n* = 45)	31.8	73.3	93.2
Hungary (*n* = 87)	36.8	35.6	26.4
Italy (*n* = 147)	68.0	55.1	40.8
Malta (*n* = 129)	36.4	31.0	24.8
Poland (*n* = 150)	48.0	34.0	30.0
Spain (*n* = 86)	30.2	34.9	25.6
Sweden (*n* = 109)	45.9	34.9	11.9
Turkey (*n* = 112)	15.2	15.2	69.4
England (UK) (*n* = 164)	54.3	44.5	32.9
Portugal (this study) (*n* = 150)	25.3	10.0	12.0

Results are expressed as mean ± standard deviation or percentage. FD, family doctor. EE, Emotional Exhaustion; DP, Depersonalization; PA, Personal Accomplishment. 1. Corresponds to the year of publication, not to the time of survey.

Figure 1 - Venn's diagram with the number of participants with high burnout scores in one, two or three subscales, N = 150.



Results are expressed as number (percentage) of subjects.

Supplementary table 1 - Burnout mean scores according to selected participants' characteristics.

	Emotional Exhaustion	*Test*	Depersonalization	*Test*	Personal Accomplishment	*Test*
Gender						
Male	19.7 ± 13.1	2584.5 ^{ns}	6.6 ± 4.7	**2078.0***	40.5 ± 7.1	**2206.0***
Female	17.7 ± 12.1		4.7 ± 4.8		38.5 ± 7.4	
Age						
<=45	16.5 ± 11.6	1596.0 ^{ns}	4.8 ± 3.6	1713.5 ^{ns}	40.1 ± 4.4	1704.0 ^{ns}
>45	19.1 ± 12.8		5.8 ± 5.7		39.4 ± 7.9	
Children						
Yes	19.0 ± 12.5	801.0 ^{ns}	5.8 ± 5.2	**678.0***	39.7 ± 7.0	794.5 ^{ns}
No	15.2 ± 12.9		3.9 ± 5.9		36.6 ± 9.8	
Marital status						
Single/Divorced	14.9 ± 12.6	**1452.0***	4.6 ± 5.8	1479.0 ^{ns}	39.6 ± 8.5	1786.5 ^{ns}
Married/Union	19.6 ± 12.4		5.8 ± 5.0		39.4 ± 7.1	
Practice years						
≤20	15.9 ± 11.1	1688.5 ^{ns}	4.6 ± 3.5	1879.5 ^{ns}	39.9 ± 4.6	1912.5 ^{ns}
>20	19.6 ± 12.9		5.9 ± 5.7		39.2 ± 8.0	
Hours/day patien.						
≤5	17.4 ± 7.8		5.1 ± 4.1		30.8 ± 11.5	
6-8	19.2 ± 13.2	0.7 ^{ns}	5.8 ± 5.5	3.3 ^{ns}	39.6 ± 6.9	**6.1 ***
≥9	23.1 ± 13.4		9.1 ± 5.9		36.6 ± 8.6	
Hours/week inst.						
≤40	17.9 ± 13.7	2368.5 ^{ns}	5.4 ± 5.8	2234.5 ^{ns}	39.5 ± 8.8	2356.5 ^{ns}
>40	19.3 ± 11.7		5.8 ± 4.9		39.3 ± 6.2	
Practice unit						
FHCU	16.1 ± 10.8	1701.0 ^{ns}	5.3 ± 4.6	1915.5 ^{ns}	41.0 ± 5.7	1663.5 ^{ns}
PHCU	19.4 ± 12.9		5.6 ± 5.1		38.8 ± 7.8	
Other inst.						
Yes	16.8 ± 12.0	2174.0 ^{ns}	5.5 ± 5.3	2211.5 ^{ns}	40.2 ± 7.1	2237.5 ^{ns}
No	19.3 ± 12.9		5.6 ± 5.3		39.0 ± 7.6	

Results are expressed as mean ± standard deviation. Comparisons were performed with Mann-Whitney or Kruskall-Wallis: NS, not significant. *, p <0.05. FHCU, Family Health Care Unit. PHCU, Personalized Health Care Unit.

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Page 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	Pages 3-4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 5
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 5
Methods			
Study design	4	Present key elements of study design early in the paper	Page 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	Pages 5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Page 6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Page 6
Bias	9	Describe any efforts to address potential sources of bias	Page 6

Study size	10	Explain how the study size was arrived at	Page 5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	Page 6
		(*b*) Describe any methods used to examine subgroups and interactions	Page 6
		(*c*) Explain how missing data were addressed	Pages 6-7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Pages 8-9
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Page 9
Discussion			
Key results	18	Summarise key results with reference to study objectives	Page 10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Page 9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Pages 8-9
Generalisability	21	Discuss the generalisability (external validity) of the study results	Pages 9-10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BURNOUT LEVELS AMONG PORTUGUESE FAMILY DOCTORS: A NATIONWIDE SURVEY

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BURNED-OUT BUT PROUD PORTUGUESE FAMILY DOCTORS

A CROSS-SECTIONAL SURVEY

Short title: Burnout in Portuguese Family Doctors

Gisela Marcelino* [1]; João Melich-Cerveira* [1]; Inês Carvalho[1]; João Azeredo Costa[1]; Marta Lopes[1]; Nelson Calado[2] and Pedro Marques-Vidal [3,4]

[1] Medical Faculty of Lisbon, University of Lisbon, Avenida Professor Egas Moniz, 1649-028 Lisbon, Portugal; [2] Alvalade Health Center, Av. do Brasil, 53, Pavilhão 33, Parque de Saúde de Lisboa, Lisbon, Portugal; [3] Institute of Social and Preventive Medicine (IUMSP), University Hospital of Lausanne, Route de la Corniche 2, 1066 Epalinges, Switzerland;

* Both authors contributed equally

Emails of authors:

Gisela Marcelino (GM): giselamarcelino@sapo.pt

João Melich-Cerveira (JMC): joao_cerveira86@hotmail.com

Inês Carvalho (IC): inesdcarvalho@gmail.com

João Azeredo Costa (JAC): j.azeredo.costa@gmail.com

Marta Lopes (ML): msclopes13@gmail.com

Nelson Calado (NC): caladonelson@yahoo.com.br

Pedro Marques-Vidal (PMV): pedro-manuel.marques-vidal@chuv.ch

Address for reprints and correspondence

Gisela Marcelino

Praça Artur Portela

2, 1º esquerdo

1500-061, Lisboa

Tel: + 351969911416

E-mail: giselamarcelino@sapo.pt

We state that Gisela Marcelino and João Melich-Cerveira, having contributed equally, were responsible for the conception, design, and acquisition of data. They both

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We state that that the manuscript, including related data, figures and tables have not been previously published, that the manuscript is not under consideration elsewhere, and that there is no additional data available.

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Abstract

Aim: To characterize the prevalence of burnout syndrome (BS) in a sample of FDs working in the Portuguese National Health System.

Design: Cross-sectional survey.

Setting: Primary Health Care Centers (HCC) from the 18 continental districts and 2 archipelagos of Portugal.

Method: The Portuguese version of the Maslach Burnout Inventory–Human Services Survey (MBI–HSS) was sent to 40 randomly selected health-care centers (HCC) and distributed to the FDs employed. Socio-demographic and work-related data was also collected. Participants were classified as having high, average or low levels of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) dimensions of burnout.

Results: 371 questionnaires were sent, of which 153 (83 women, age range 29-64 years; response rate 41%) returned. One quarter (25.3%) of FDs scored high for emotional exhaustion (EE), 10.0% for depersonalization (DP) and 12.0% for lack of personal accomplishment (PA). In comparison with women, men scored higher in all the three subscales: EE (median [interquartile interval]: 14.5 [16.3] vs. 17.0 [22.0], respectively, *P*-value not significant), DP (3.0 [5.8] vs. 6.0 [6.8], $P < 0.05$), and PA (40.0 [8.0] vs. 42.5 [8.0] $P < 0.05$). Increasing working hours per day also led to higher PA scores ($P < 0.05$). The prevalence of burnout ranged between 2.0% and 27.7%, depending on the definition used.

Conclusion: High burnout is relatively common among Portuguese family doctors, yet lower than reported for other European countries. Burnout relief measures should be developed in order to prevent a further increase of BS among Portuguese FDs.

Key Words: Burnout, Portugal, family doctors, MBI-HSS.

Article Focus: In the last three decades, BS increased to worrisome levels in doctors, including FDs, and there is scarce data concerning this condition in Portuguese FDs.

Key Messages: The prevalence of burnout ranged between 2.0% and 27.7%, depending on the definition used; but still, Portuguese FDs feel rewarded by their job.

Strengths and Limitations: This is, as far as we know, the first study ever on BS in Portuguese FDs. The questionnaire MBI-HSS hadn't been validated in Portugal at the time of the study; still, Cronbach's α values ranged between 0.64 (for DP) and 0.90 (for EE), also in agreement with literature.

Introduction

In the last three decades, burnout syndrome increased to worrisome levels in doctors [1, 2], including family doctors (FD)[3]. Despite the presence of burnout most family doctors usually do not seek help[4], which might lead to a decrease in their performance and even compromise adequate treatment of patients.

Burnout is consequent to job-related chronic stress[5] and is characterized by a symptomatic triad of emotional exhaustion (EE) (feelings of tiredness and emptiness), depersonalization (DP) (empathy disappearance, cynicism and automatism) and a lack of personal accomplishment (PA) (lack of self-esteem and frustration)[5].

In 2008, a European study on burnout among European family doctors (the EGPRN study[3]) showed that 43% of respondents scored high for EE burnout, 35% for DP and 32% for PA, with 12% scoring high burnout in all three dimensions. Unfortunately, the EGPRN study did not include Portugal, so we conducted a study to assess the prevalence of burnout among Portuguese FDs, using the same methodology as the EGPRN.

Method

This study was conducted between November 2010 and November 2011. A stratified and randomized sampling was conducted selecting 2 primary health care centers (HCC) from each of the 18 Portuguese continental districts and 2 archipelagos (Madeira and Azores) of Portugal as described in the site “Portal da Saúde” from the Portuguese Ministry of Health[6]. Questionnaires were sent with pre-paid return envelopes to previously contacted HCC employees, who distributed the questionnaires

with informed consent to every FD employed. 17 questionnaires were sent and received via e-mail.

FDs in HCCs work in either Family Health-Care Units (FHCU) or Personalized Health-Care Units (PHCU). The first provides health-care to families, while the second provides health-care to individuals in general. Burnout was assessed using the Portuguese translation of the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)[4]. Answers to the MBI-HSS were used to classify the participants as having high, average or low levels in EE, DP and PA dimensions of burnout. The following cut-offs were used to define low, average of high levels of each dimension of the MBI-HSS: EE: low, ≤ 16; average, 17-26; high; ≥27; DP: low, ≤6; average, 7-12; high, ≥13; PA: low, ≥ 39; average, 32-38; high, ≤ 31 [7]. As the definition of burnout is a controversial subject, we applied different definitions as described in the literature: 1) high levels of EE and DP, combined with low PA [8, 9]; 2) high EE and/or high DP[10, 11] and 3) high negative score on EE in combination with high DP or low PA [12]. The study was approved by the Ethics Commissions of North, Algarve, and Madeira, and also by all Portuguese Regional Administrations.

Statistical analysis was performed using SPSS v. 17.0 (IBM SPSS statistics, Armonk, NY, USA). Results were expressed as median [interquartile interval], mean ± standard deviation, or number of subjects (percentage). Comparisons were performed using Mann-Whitney or Kruskall-Wallis nonparametric tests for quantitative data and by chi-square for qualitative data. Multivariate analysis was conducted using logistic regression. Results were considered significant if P <0.05. As to missing data, for each skipped MBI-HSS item, it was attributed the mean score calculated for that question's

dimension. Two skipped questions were coded as missing value for the whole dimension. Two answers for the same item were coded as one skipped question and replaced by the average of that dimension.

Results

Overall, **371** questionnaires were sent, of which 153 (response rate 41%) were retrieved. From these, only 150 were considered valid for the analysis. The main results are summarized in **table 1**. Men were older and had more years of professional activity than women. Overall, 25.3% of participants scored high for EE, 10.1% for DP and 12.0% for PA; 2.0% scored high for all three dimensions. Men scored higher DP and PA than women, while no differences were found for EE (**table 1**). No significant bivariate association was found between burnout scores and age, years of practice, hours spent at the primary care center per week, practice unit, and if working in more than one institution (not shown – supplementary table 1 for reviewing purposes only). In contrast, having children was related to increasing DP scores (P <0.05), and being married or in civil union with increasing EE scores (P <0.05).

Finally, multivariate logistic regression including gender, age, marital status, if having any children or not, years of professional activity, number of hours of work per week, number of hours in contact with patients per day, practice unit, and if working in any other institution, was performed according to the different definitions of burnout. Increased risk for burnout was obtained for people working in Personalized (odds of 3.62, P <0.05) relative to Family Health Care Units and also for increasing years of

professional activity (odds of 1.69, *P* <0.05), when considering burnout as, respectively, high EE and/or high DP or high score on EE in combination with high DP or low PA.

In **table 3** it is evident that Portugal FDs are comparatively in a more favorable situation. Participants scoring at least high and at least average in one dimension were 33.0% and 53.5%, respectively; and 31.1% scored exclusively low in each dimension (*see* **table 2**).

Discussion

To our knowledge, this is the first study ever to assess rates of burnout among FDs in Portugal. Our study also complements the previous findings of the EGPRN study[3], which assessed burnout among FDs from 12 European countries. The main finding is that in Portugal, in overall, FDs have low levels of burnout for the three subscales EE, DP and PA. In relation to each gender, men have higher symptoms of burnout, but since they are significantly older and have more years of professional activity than women, this might be an explanation for the different results.

The prevalence of burnout ranged from 2.0% to 27.7%, depending on the definition used. This wide range is due to the different combinations of EE, DP and PA subscales, as indicated in **figure 1** [8-12]. Hence, it would be of interest that studies on burnout report their results using one or several definitions, or as suggested in figure 1, in order to facilitate comparisons with the literature. Finally, if burnout is considered as a continuous process, the majority of FDs is at risk, although with different grades of risk (between 41.2% - 66.9%, considering the previous definitions of burnout and excluding those who have low burnout symptoms in the three subscales), as shown in

table 2. The Portuguese FDs had lower burnout scores than FDs from other European countries (*see* **table 3**). A possible explanation might be related to a slightly lower workload among Portuguese FDs compared to their colleagues from other countries. For instance, Portugal has 198.3 FDs per 100,000 inhabitants, a much higher number in comparison with the United Kingdom, which has only 78.3 FDs per 100,000[13]. Further, a Portuguese FD has on average 1500[14] patients, again a value lower than in the UK (1800)[15]. Another possible explanation is that Portuguese FDs consider their job as very demanding, but very rewarding at the same time, as reflected by a lower prevalence of bad PA among men who have higher levels of EE and DP, in comparison to women, and also, by increasing significant (P <0.05) PA scores with increasing working hours per day (not shown – supplementary table 1 for reviewing purposes only). Still, further studies are advisable to better understand the low burnout prevalence and scores among Portuguese doctors relative to their European counterparts.

This study has some limitations worth noting. First the response rate (41%) was rather low, but identical to the one reported by the EGPRN study[3]. The questionnaire MBI hadn't been validated in Portugal at the time of the study; still, Cronbach's α values ranged between 0.64 (for DP) and 0.90 (for EE), also in agreement with those reported in the EGPRN study[3]. Finally, only FDs present at the HCCs answered, thus excluding those on sick leave; hence, it is possible that the burnout rates reported are underestimated. Still, in the absence of other studies available, our results provide the first estimation of the burnout rates among FDs in Portugal. The results of our study have important implications. In Portugal, there is currently no aid for dealing with

burnout among health professionals. Hence, it would be of uttermost importance that the Portuguese Ministry of Health, the Portuguese College of Physicians or the Regional Health Administrations provide some support at institutional and individual levels. Finally, another study would be desirable to assess the progression of burnout among Portuguese FDs.

In summary, our results suggest that a significant percentage of Portuguese FD present with burnout. These values are nevertheless lower than reported in other European countries.

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Table 1 – Main characteristics of the participants.

Variables	All	Male	Female	*Test*
Age	54.5 [9.0] (*n* = 148)	55.0 [5.0] (*n* = 67)	53.0 [13.0] (*n* = 81)	1813.0***
Years of professional activity	29.0 [10.3] (*n* = 150)	30.0 [4.0] (*n* = 67)	28.0 [5.0] (*n* = 83)	2103.0*
Hours of work per week	42.0 [3.0] (*n* = 150)	42.0 [3.4] (*n* = 68)	42.0 [2.0] (*n* = 82)	2744.0 ns
Hours of contact with patients per day	7.0 [1.5] (*n* = 138)	7.0 [1.6] (*n* = 61)	7.0 [1.6] (*n* = 77)	2201.0 ns
Emotional exhaustion score	16.0 [19.0]	17.0 [22.0]	14.5 [16.3]	2584.5 ns
High emotional exhaustion score	38 (25.3) (*n* = 150)	21 (30.9) (*n* = 68)	17 (20.7) (*n* = 82)	2.08 ns
Depersonalization score	4.0 [5.0]	6.0 [6.8]	3.0 [5.8]	2078.0*
High depersonalization score	15 (10.1) (*n* = 148)	10 (14.7) (*n* = 68)	5 (6.3) (*n* = 80)	3.52 ns
Personal Accomplishment score	41.0 [8.0]	42.5 [8.0]	40.0 [8.0]	2206.0*
Low personal accomplishment score	18 (12.0) (*n* = 150)	6 (8.8) (*n* = 68)	12 (14.6) (*n* = 82)	4.28 ns
Burnout §	3 (2.0) (*n* = 148)	2 (2.9) (*n* = 68)	1 (1.3) (*n* = 80)	NA
Burnout §§	41 (27.7) (*n* = 148)	22 (32.4) (*n* = 68)	19 (23.8) (*n* = 80)	1.36 ns
Burnout §§§	18 (12.2) (*n* = 148)	9 (13.2) (*n* = 68)	9 (11.3) (*n* = 80)	0.14 ns

Results are expressed as median [interquartile interval] or number (percentage) of the total subjects. Comparisons performed with Mann-Whitney nonparametric test for quantitative data and by chi-square for qualitative data: NA, not accessible for statistical analysis. NS, not significant. *, p <0.05. **, p <0.01, ***, p <0.001. Burnout defined as § high levels of EE and DP, combined with low PA; §§ high EE and/or high DP and §§§ high score on EE in combination with high DP or low PA.

Table 2 – Number of participants with low, average and high burnout scores in none, one, two or three subscales.

	High Burnout				
	0	1	2	3	Total
Average burnout					
0	46 (31.1)	15 (10.1)	5 (3.4)	3 (2.0)	69 (46.6)
1	39 (26.4)	14 (9.5)	10 (6.8)	-	63 (42.6)
2	12 (8.1)	2 (1.4)	-	-	14 (9.5)
3	2 (1.4)	-	-	-	2 (1.4)
Total	99 (66.9)	31 (20.9)	15 (10.1)	3 (2.0)	148 (100)

The possible combinations for the different subscales describing increasing burnout are shown in the table. Participants with low burnout scores in one dimension are represented by excluding average or high burnout. Results are expressed as number (percentage) of the total subjects.

Table 3 – Results for each burnout subscale in previous and recent European studies.

European Studies	**EE**	**DP**	**PA**
EGPRN study, Overall (2008, *n* = 1393)[3]	24.0 ± 16.0	7.0 ± 7.0	37 ± 11.0
Spanish FDs [1] (2005, *n* = 86)[16]	27.4 ± 11.8	10.07 ± 6.4	35.9 ± 10.07
Swiss FDs (2002, *n* = 1755)[17]	17.9 ± 9.8	6.5 ± 4.7	39.6 ± 6.5
EGPRN study (2008)[3]	**High EE (%)**	**High DP (%)**	**Low PA (%)**
Overall (*n* = 1393)	43.0	35.3	32.0
Bulgaria (*n* = 69)	62.3	30.4	18.8
Croatia (*n* = 117)	41.9	12.0	13.7
France (*n* = 178)	33.7	35.4	27.5
Greece (*n* = 45)	31.8	73.3	93.2
Hungary (*n* = 87)	36.8	35.6	26.4
Italy (*n* = 147)	68.0	55.1	40.8
Malta (*n* = 129)	36.4	31.0	24.8
Poland (*n* = 150)	48.0	34.0	30.0
Spain (*n* = 86)	30.2	34.9	25.6
Sweden (*n* = 109)	45.9	34.9	11.9
Turkey (*n* = 112)	15.2	15.2	69.4
England (UK) (*n* = 164)	54.3	44.5	32.9
Portugal (this study) (*n* = 150)	25.3	10.0	12.0

Results are expressed as mean ± standard deviation or percentage. FD, family doctor. EE, Emotional Exhaustion; DP, Depersonalization; PA, Personal Accomplishment. 1. Corresponds to the year of publication, not to the time of survey.

Supplementary table 1 - Burnout mean scores according to selected participants' characteristics.

	Emotional Exhaustion	*Test*	Depersonalization	*Test*	Personal Accomplishment	*Test*
Gender						
Male	19.7 ± 13.1	2584.5 ^{ns}	6.6 ± 4.7	**2078.0***	40.5 ± 7.1	**2206.0***
Female	17.7 ± 12.1		4.7 ± 4.8		38.5 ± 7.4	
Age						
<=45	16.5 ± 11.6	1596.0 ^{ns}	4.8 ± 3.6	1713.5 ^{ns}	40.1 ± 4.4	1704.0 ^{ns}
>45	19.1 ± 12.8		5.8 ± 5.7		39.4 ± 7.9	
Children						
Yes	19.0 ± 12.5	801.0 ^{ns}	5.8 ± 5.2	**678.0***	39.7 ± 7.0	794.5 ^{ns}
No	15.2 ± 12.9		3.9 ± 5.9		36.6 ± 9.8	
Marital status						
Single/Divorced	14.9 ± 12.6	**1452.0***	4.6 ± 5.8	1479.0 ^{ns}	39.6 ± 8.5	1786.5 ^{ns}
Married/Union	19.6 ± 12.4		5.8 ± 5.0		39.4 ± 7.1	
Practice years						
≤20	15.9 ± 11.1	1688.5 ^{ns}	4.6 ± 3.5	1879.5 ^{ns}	39.9 ± 4.6	1912.5 ^{ns}
>20	19.6 ± 12.9		5.9 ± 5.7		39.2 ± 8.0	
Hours/day patien.						
≤5	17.4 ± 7.8		5.1 ± 4.1		30.8 ± 11.5	
6-8	19.2 ± 13.2	0.7 ^{ns}	5.8 ± 5.5	3.3 ^{ns}	39.6 ± 6.9	**6.1 ***
≥9	23.1 ± 13.4		9.1 ± 5.9		36.6 ± 8.6	
Hours/week inst.						
≤40	17.9 ± 13.7	2368.5 ^{ns}	5.4 ± 5.8	2234.5 ^{ns}	39.5 ± 8.8	2356.5 ^{ns}
>40	19.3 ± 11.7		5.8 ± 4.9		39.3 ± 6.2	
Practice unit						
FHCU	16.1 ± 10.8	1701.0 ^{ns}	5.3 ± 4.6	1915.5 ^{ns}	41.0 ± 5.7	1663.5 ^{ns}
PHCU	19.4 ± 12.9		5.6 ± 5.1		38.8 ± 7.8	
Other inst.						
Yes	16.8 ± 12.0	2174.0 ^{ns}	5.5 ± 5.3	2211.5 ^{ns}	40.2 ± 7.1	2237.5 ^{ns}
No	19.3 ± 12.9		5.6 ± 5.3		39.0 ± 7.6	

Results are expressed as mean ± standard deviation. Comparisons were performed with Mann-Whitney or Kruskall-Wallis: NS, not significant. *, p <0.05. FHCU, Family Health Care Unit. PHCU, Personalized Health Care Unit.

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Page 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	Pages 3-4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 5
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 5
Methods			
Study design	4	Present key elements of study design early in the paper	Page 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	Pages 5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Page 6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Page 6
Bias	9	Describe any efforts to address potential sources of bias	Page 6

Study size	10	Explain how the study size was arrived at	Page 5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	Page 6
		(*b*) Describe any methods used to examine subgroups and interactions	Page 6
		(*c*) Explain how missing data were addressed	Pages 6-7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Pages 8-9
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Page 9
Discussion			
Key results	18	Summarise key results with reference to study objectives	Page 10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Page 9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Pages 8-9
Generalisability	21	Discuss the generalisability (external validity) of the study results	Pages 9-10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Supplementary table 1: Burnout mean scores according to selected participants' characteristics.

	Emotional Exhaustion	*Test*	Depersonalization	*Test*	Personal Accomplishment	*Test*
Gender						
Male	19.7 ± 13.1	2584.5 ^{ns}	6.6 ± 4.7	**2078.0***	40.5 ± 7.1	**2206.0***
Female	17.7 ± 12.1		4.7 ± 4.8		38.5 ± 7.4	
Age						
<=45	16.5 ± 11.6	1596.0 ^{ns}	4.8 ± 3.6	1713.5 ^{ns}	40.1 ± 4.4	1704.0 ^{ns}
>45	19.1 ± 12.8		5.8 ± 5.7		39.4 ± 7.9	
Children						
Yes	19.0 ± 12.5	801.0 ^{ns}	5.8 ± 5.2	**678.0***	39.7 ± 7.0	794.5 ^{ns}
No	15.2 ± 12.9		3.9 ± 5.9		36.6 ± 9.8	
Marital status						
Single/Divorced	14.9 ± 12.6	**1452.0***	4.6 ± 5.8	1479.0 ^{ns}	39.6 ± 8.5	1786.5 ^{ns}
Married/Union	19.6 ± 12.4		5.8 ± 5.0		39.4 ± 7.1	
Practice years						
≤20	15.9 ± 11.1	1688.5 ^{ns}	4.6 ± 3.5	1879.5 ^{ns}	39.9 ± 4.6	1912.5 ^{ns}
>20	19.6 ± 12.9		5.9 ± 5.7		39.2 ± 8.0	
Hours/day patien.						
≤5	17.4 ± 7.8		5.1 ± 4.1		30.8 ± 11.5	
6-8	19.2 ± 13.2	0.7 ^{ns}	5.8 ± 5.5	3.3 ^{ns}	39.6 ± 6.9	**6.1 ***
≥9	23.1 ± 13.4		9.1 ± 5.9		36.6 ± 8.6	
Hours/week inst.						
≤40	17.9 ± 13.7	2368.5 ^{ns}	5.4 ± 5.8	2234.5 ^{ns}	39.5 ± 8.8	2356.5 ^{ns}
>40	19.3 ± 11.7		5.8 ± 4.9		39.3 ± 6.2	
Practice unit						
FHCU	16.1 ± 10.8	1701.0 ^{ns}	5.3 ± 4.6	1915.5 ^{ns}	41.0 ± 5.7	1663.5 ^{ns}
PHCU	19.4 ± 12.9		5.6 ± 5.1		38.8 ± 7.8	
Other inst.						
Yes	16.8 ± 12.0	2174.0 ^{ns}	5.5 ± 5.3	2211.5 ^{ns}	40.2 ± 7.1	2237.5 ^{ns}
No	19.3 ± 12.9		5.6 ± 5.3		39.0 ± 7.6	

Results are expressed as mean ± standard deviation. Comparisons were performed with Mann-Whitney or Kruskall-Wallis: NS, not significant. *, p <0.05. FHCU, Family Health Care Unit. PHCU, Personalized Health Care Unit.

Supplementary table 2: logistic regression to assess the factors individually and independently associated with burnout components.

	High EE	High DP	Low PA (1)	Low PA (2)
Gender				
Woman	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)
Man	1.45 (0.63-3.35)	2.06 (0.79-5.39)	0.40 (0.14-1.14)	0.33 (0.12-0.95)
Marital status				
Single/Divorced	1 (ref.)	1 (ref.)	-	-
Married/Union	3.06 (0.84-11.19)	2.88 (0.62-13.29)	-	-
Age category				
≤45	-	-	1 (ref.)	-
>45	-	-	3.02 (0.82-11.17)	-
Years of activity				
≤20	-	1 (ref.)	-	1 (ref.)
>20	-	1.78 (0.47-6.67)	-	3.07 (0.81-11.67)
Practice unit				
FHCU	1 (ref.)	-	1 (ref.)	1 (ref.)
PHCU	2.48 (0.92-6.71)	-	3.31 (0.70-15.74)	2.63 (0.81-8.55)

EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment; FHCU, Family Health Care Unit; PHCU, Personalized Health Care Unit; -, not included in the model. Results are expressed as Odds ratio and (95% confidence interval). For low PA, two models were used as the variables years of activity and age categories were correlated and their simultaneous inclusion led to a non-estimable model. Statistical analysis by multivariate logistic regression not taking into account sample stratification.

Supplementary table 3: Prevalence of burnout among Portuguese general practitioners, using original cut-offs for the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)

Variables	All	Male	Female	*Test*
High emotional exhaustion score	38 (25.3) (*n* = 150)	21 (30.9) (*n* = 68)	17 (20.7) (*n* = 82)	2.08 [ns]
High depersonalization score	38 (25.3) (*n* = 150)	21 (30.9) (*n* = 68)	17 (20.7) (*n* = 82)	2.08 [ns]
Low personal accomplishment score	18 (12.0) (*n* = 150)	6 (8.8) (*n* = 68)	12 (14.6) (*n* = 82)	4.28 [ns]
Burnout [§]	3 (2.0) (*n* = 148)	2 (2.9) (*n* = 68)	1 (1.3) (*n* = 80)	NA
Burnout [§§]	41 (27.7) (*n* = 148)	22 (32.4) (*n* = 68)	19 (23.8) (*n* = 80)	1.36 [ns]
Burnout [§§§]	18 (12.2) (*n* = 148)	9 (13.2) (*n* = 68)	9 (11.3) (*n* = 80)	0.14 [ns]

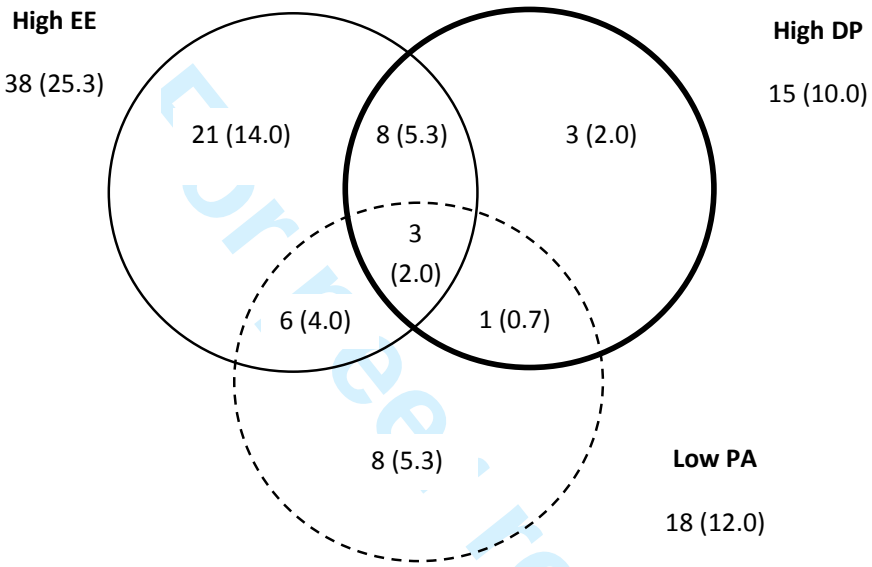
Results are expressed as number of participants and (percentage). Statistical analysis by chi-square: ns, not significant, NA, not assessable. Burnout defined as § high levels of emotional exhaustion and depersonalization, combined with low personal accomplishment; §§ high emotional exhaustion and/or high depersonalization and [§§§] high score on emotional exhaustion in combination with high depersonalization or low personal accomplishment.

Supplementary table 4: Number of participants with low, average and high burnout scores in none, one, two or three subscales, using original cut-offs for the Maslach Burnout Inventory – Human Services Survey (MBI-HSS)

	High Burnout				
	0	1	2	3	Total
Average burnout					
0	46 (31.1)	15 (10.1)	5 (3.4)	3 (2.0)	69 (46.6)
1	39 (26.4)	14 (9.5)	10 (6.8)	-	63 (42.6)
2	12 (8.1)	2 (1.4)	-	-	14 (9.5)
3	2 (1.4)	-	-	-	2 (1.4)
Total	99 (66.9)	31 (20.9)	15 (10.1)	3 (2.0)	148 (100)

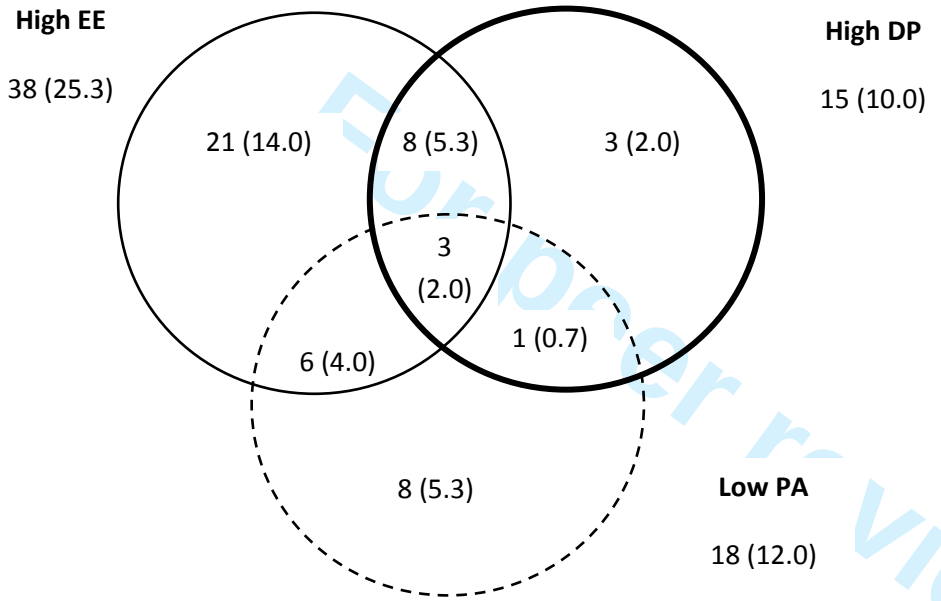
The possible combinations for the different subscales describing increasing burnout are shown in the table. Participants with low burnout scores in one dimension are represented by excluding average or high burnout. Results are expressed as number (percentage) of the total subjects.

Supplementary figure 1 - Venn's diagram with the number of participants with high burnout scores in one, two or three subscales, using, original cut-offs for the Maslach Burnout Inventory – Human Services Survey (MBI-HSS). N = 150.



Results are expressed as number (percentage) of subjects.

Figure 1 - Venn's diagram with the number of participants with high burnout scores in one, two or three subscales, N = 150.



Results are expressed as number (percentage) of subjects.