Burnout and occupational stress in the medical residents of Oncology, Haematology and Radiotherapy: a prevalence and predictors study in Portugal

Ana Joaquim\textsuperscript{a,b}, Sandra Custódio\textsuperscript{a,b}, Joana Savva-Bordalo\textsuperscript{c}, Sérgio Chacim\textsuperscript{d}, Inês Carvalhais\textsuperscript{e}, Liliana Lombo\textsuperscript{f}, Heitor Lopes\textsuperscript{g}, António Araújo\textsuperscript{a,c}* and Rui Gomes\textsuperscript{g}

\textsuperscript{a}Serviço de Oncologia Médica, Centro Hospitalar de Entre o Douro e Vouga (CHEDV), Santa Maria da Feira, Portugal; \textsuperscript{b}Serviço de Oncologia, Centro Hospitalar de Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal; \textsuperscript{c}Serviço de Oncologia Médica, Instituto Português de Oncologia do Porto Francisco Gentil (IPOPFG), Porto, Portugal; \textsuperscript{d}Serviço de Onco-Hematologia, IPOPFG, Porto, Portugal; \textsuperscript{e}Serviço de Hematologia, Centro Hospitalar de São João, Porto, Portugal; \textsuperscript{f}Serviço de Radioterapia, IPOPFG, Porto, Portugal; \textsuperscript{g}Escola de Psicologia, Universidade do Minho, Braga, Portugal

ABSTRACT

Burnout is a professional syndrome associated with stress caused by overwork. Our aim was to calculate the prevalence of burnout and stress on medical residents of Oncology, Haematology and Radiotherapy in Portugal, as well as to determine predictors of burnout and stress. An anonymous questionnaire was applied \((n = 118)\). Statistical analysis consisted of a descriptive and inferential analysis. The prevalence of burnout and stress was calculated to be 45.2 and 50\%, respectively. The dimensions that generated higher levels of stress were 'dealing with patients' and 'overwork'. Burnout was directly related with stress dimension 'overwork'. The prevalence of burnout in Portuguese oncological residents is high as in other European countries and in the U.S. Therefore, interventional strategies can be designed.

Introduction

Burnout is an emotional exhaustion syndrome caused by occupational stress that often occurs in human service professionals (Maslach & Jackson, 1981; Melo, Gomes, & Cruz, 1999). Relationship between people and their jobs evolve negatively over time, as first reported in early 60–70s in U.S. (Maslach, Schaufeli, & Leiter, 2001).

Burnout differs from occupational stress, as a result of prolonged exposure to multi-source stress (Melo et al., 1999).

Studies have shown a high incidence of burnout within medical doctors, especially oncologists (Caplan, 1994; Grunfeld et al., 2000; Olkinuora et al., 1990; Theorell, 2000; Whippen & Canellos, 1991). Other studies suggested a prevalence of 25–35\% among medical
oncologists, 38% among radiotherapists and 28–36% among surgeons (Font, Corti, & Berger, 2015; Shanafelt & Dyrbye, 2012).

Moreover, it has been shown that burnout is highly prevalent in medical residents, mainly due to the intense stress, overload of work hours and increased responsibility (Dyrbye et al., 2008; Thomas, 2004). Burnout prevalence among French residents of Oncology, Haematology and Radiotherapy was evaluated in 44% (Blanchard et al., 2010) while in Italy the prevalence of burnout in young radiotherapists was determined to be 35% (Ciammella et al., 2011).

In Portugal, although there are some studies about burnout in health professionals (Gomes, Cruz, & Cabanelas, 2009; Gomes, Melo, & Cruz, 2000; Gonçalves et al., 2016; de Melo Silva & da Silva Gomes, 2009), the prevalence of burnout in medical residents is still unknown. Furthermore, few studies focus on the relationship between burnout and occupational stress and how both dimensions contribute adversely to healthcare delivery. Therefore, our aims were to determine the prevalence of burnout and stress in Portuguese residents of Oncology, Haematology and Radiotherapy, and to identify possible predictors of both burnout and stress.

**Subjects and methods**

A multicentre, cross-sectional study was conducted in Portugal, between April and May 2011. All procedures were in accordance with the ethical standards of the IGH-GCP guidelines and with the Declaration of Helsinki. The study questionnaire and the informed consent was approved by the Psychology School of University of Minho.

The questionnaire was composed by demographic, labour and personal questions followed by application of two instruments: Stress Questionnaire for Health Professionals (SQHP) and Maslach’s Burnout Inventory – Human Service Surveys (MBI-HSS) previously translated to Portuguese and validated (Gonzaga, 2003). Their internal consistency assessed by the Alfa Cronbach measurement resulted in good consistency values (.70–.90).

Statistical analysis was divided in three parts: descriptive analysis, double variable inferential analysis and multiple inferential analysis. On the double variable inferential analysis, burnout and stress dimensions averaged values were compared between the three specialties. The multiple comparisons were made by the Bonferroni method (statistical significance for \( p \leq .017 \)). On the multiple inferential analysis, to search for burnout and stress predicting factors, the independent variables (\( p \leq .1 \)) were included on the hierarchical regression. Statistical significance was established at \( p \leq .05 \), except in those cases mentioned above.

**Results**

**Description of the sample**

In total, 211 medical residents were completing the complementary internship on Oncology (58.3%), Haematology (25.6%) and Radiotherapy (16.1%), of whom 118 individuals responded to the questionnaire (response rate of 55.6%). Concerning all independent variables, the population was described for the three subgroups of specialty (Table 1).
Prevalence of burnout and stress

One hundred and fifteen physicians responded to MBI-HSS. In global, burnout prevalence was 45.2%. The SQHP general level of stress question was responded by 106 physicians (89.8%) and a 50% stress prevalence was observed. Furthermore, it was verified that ‘dealing with patients’ and ‘work excess’ play an important role on generating higher average levels of stress while ‘career and remuneration’ was associated to low average levels of stress.

The results obtained from the comparison between the three specialties average values of each burnout and stress dimension are presented in Table 2. The dimensions with potentially significant differences (p ≤ .10) were pair compared (Table 3). It was observed that Oncology residents had higher levels of ‘depersonalization’ and of stress related with ‘dealing with patients’ than Radiotherapy residents.

Predictable factors of burnout and stress

To obtain the potentially predicting variables, a Spearman correlation was performed between the independent variables and the dimensions of burnout (Table 4) and stress (Table 5). Hierarchical regression results to predict each dimension of burnout and stress through the independent variables, which had a potentially significant correlation (p ≤ .10), are described in Additional file (tables 1–8). The dimension that appeared to be predictable was the burnout dimension ‘emotional exhaustion’. The biggest predictor was stress through ‘work excess’ (Figure 1), followed by stress through ‘dealing with patients’. Furthermore, the specialty Radiotherapy and ‘having a hobby’ were predictors of ‘emotional exhaustion’ in reverse order.

Discussion

The present study shows that prevalence of burnout among Oncology, Haematology and Radiotherapy Portuguese residents is as high as among the same specialities French residents (Blanchard et al., 2010). Also, the occupational stress was present in half of the respondents.

Table 1. Population, global sample and specialty subgroups characteristics.

| Characteristics                       | Oncology | Haematology | Radiotherapy | All       |
|---------------------------------------|----------|-------------|--------------|-----------|
| Population (total n of residents)     | 123      | 54          | 34           | 211       |
| Sample (response rate)                | 67 (54.5%) | 27 (50%) | 24 (70.6%) | 118 (55.9%) |
| Average age (years) (SD)              | 28.4 (2.4) | 28.7 (1.8) | 27.9 (2.4) | 28.4 (2.2) |
| Gender: N (%)                         | Feminine | 51 (76.1%) | 21 (77.8%) | 15 (62.5%) | 87 (73.7%) |
|                                        | Masculine | 16 (23.9%) | 6 (22.2%)  | 9 (37.5%)  | 31 (26.3%) |
| Marital state: N (%)                  | Married   | 18 (26.9%) | 5 (18.5%)  | 4 (16.7%)  | 27 (22.9%) |
|                                        | Single    | 44 (65.7%) | 21 (77.8%) | 18 (75%)   | 83 (70.3%) |
|                                        | Other     | 5 (7.5%)   | 1 (3.7%)   | 2 (8.3%)   | 8 (6.8%)   |
| Parenthood: N (%)                     |           | 13 (19.4%) | 2 (7.4%)   | 0          | 15 (12.7%) |
| Region: N (%)                         | North     | 36 (53.7%) | 11 (40.7%) | 7 (29.2%)  | 54 (45.8%) |
|                                        | Central   | 15 (22.4%) | 10 (37%)   | 10 (41.7%) | 35 (29.7%) |
|                                        | South and Islands | 16 (23.9%) | 6 (22.2%) | 7 (29.2%) | 29 (24.6%) |
| Internship year: N (%)                | First     | 18 (26.9%) | 6 (22.2%)  | 8 (33.3%)  | 32 (27.1%) |
|                                        | Intermediate | 35 (52.2%) | 15 (55.6%) | 14 (58.3%) | 64 (54.2%) |
|                                        | Final     | 14 (20.9%) | 6 (22.2%)  | 2 (8.3%)   | 22 (18.6%) |
| Overtime work: N (%)                  | 40 (59.7%) | 17 (63%)  | 12 (50%)   | 69 (58.5%) |
| Hobby: N (%)                          | 48 (71.6%) | 22 (81.5%) | 20 (83.3%) | 90 (76.3%) |
| Physical Exercise: N (%)              | 35 (52.2%) | 15 (55.6%) | 15 (62.5%) | 65 (55.1%) |
Table 2. Specialty comparison of stress and burnout dimensions’ average levels.

| Dimensions | Burnout | Stress |
|------------|---------|--------|
|            | Emotional exhaustion | Dealing with patients | Dealing with patients | Dealing with patients |
|            | t(2) = 5.001; p = .082 | t(2) = 7.006; p = .030 | t(2) = 2.434; p = .053 | t(2) = 3.007; p = .002 |
|            | t(2) = 4.956; p = .030 | t(2) = 3.007; p = .002 | t(2) = 3.007; p = .002 | t(2) = 3.007; p = .002 |
|            | t(2) = .076; p = .963 | t(2) = .084; p = .963 | t(2) = .084; p = .963 | t(2) = .084; p = .963 |
|            | t(2) = .191 | t(2) = .056 | t(2) = .056 | t(2) = .056 |
|            | t(2) = .157 | t(2) = .157 | t(2) = .157 | t(2) = .157 |
|            | t(2) = .117 | t(2) = .117 | t(2) = .117 | t(2) = .117 |

Legends: t – t value; df – degrees of freedom; p – p value. Significant differences: p ≤ .10.

Table 3. Comparison of average levels of stress and burnout dimensions in pairs of specialties.

| Dimensions         | Medical oncology | Haematology | Radiotherapy | Z   | p   |
|--------------------|------------------|-------------|--------------|-----|-----|
| Burnout emotional exhaustion | 44.18 | 21.28 | 27.46 | −1.529 | .126 |
|                  | 42.16 | 40.00 | 21.28 | 2.233 | .026 |
| Burnout depersonalization | 45.42 | 22.28 | 26.54 | −1.058 | .290 |
|                  | 44.43 | 34.82 | 26.54 | 2.990 | .003 |
| Stress dealing with patients | 45.13 | 30.59 | 26.32 | −.945 | .345 |
|                  | 44.53 | 36.12 | 26.32 | 2.532 | .011 |
| Stress professional relationships | 41.68 | 26.70 | 22.48 | 1.045 | .296 |
|                  | 46.10 | 39.28 | 22.48 | 4.15 | .678 |
| Stress career and remuneration | 39.09 | 28.25 | 19.15 | −2.369 | .018 |
|                  | 44.66 | 33.85 | 19.15 | 2.304 | .021 |

Table 4. Relationship between the defining dimensions of burnout with the independent variables.

| Category                     | Independent variable       | Emotional exhaustion | Depersonalization |
|------------------------------|----------------------------|----------------------|-------------------|
| Demographics                 | Gender | .01 | .501 | .9 | .599 |
| Demographics                 | Age | .00 | .716 | .993 | .13 |
| Demographics                 | Marital status | .00 | .172 | .993 | .13 |
| Demographics                 | Parenthood | .12 | .640 | .213 | .30 |
| Demographics                 | Specialty | −.19 | .021 | .046 | .06 |
| Demographics                 | Internship year | .90 | .640 | .361 | .06 |
| Demographics                 | Workplace | −.01 | .640 | .946 | .05 |
| Demographics                 | Work excess | .06 | .640 | .534 | .05 |
| Demographics                 | Hobbies | −.21 | .640 | .029 | .05 |
| Stress dimensions            | Physical exercise | .12 | .640 | .218 | .02 |
| Stress dimensions            | Dealing with patients | .23 | .218 | .021 | .02 |
| Stress dimensions            | Professional relationships | .19 | .218 | .044 | .18 |
| Stress dimensions            | Work excess | .42 | .218 | .000 | .18 |
| Stress dimensions            | Career and remuneration | .13 | .218 | .183 | .14 |
| Stress dimensions            | Training sessions | .15 | .218 | .134 | .17 |
| Stress dimensions            | Family problems | .10 | .218 | .339 | .07 |

Legend: $R_s$ – Spearman correlation coefficient; $p$ – p value.
Table 5. Relationship between the stress dimensions and the independent variables.

| Independ. variable | Dealing with patients | Professional relationships | Work excess | Career and remuner. | Training sessions | Family problems |
|--------------------|-----------------------|----------------------------|-------------|---------------------|------------------|-----------------|
|                    | $R_s$  | $P$  | $R_s$  | $p$  | $R_s$  | $p$  | $R_s$  | $p$  | $R_s$  | $p$  | $R_s$  | $p$  |
| Gender             | .22    | .026 | .19    | .050 | .15    | .117 | .02    | .839 | .19    | .059 | .14    | .148 |
| Age                | -.03   | .734 | .01    | .913 | -.16   | .099 | .05    | .602 | -.15   | .141 | -.22   | .028 |
| Marital status     | .19    | .057 | .09    | .339 | -.07   | .464 | .14    | .15  | .16    | .095 | -.14   | .150 |
| Parenthood         | .03    | .780 | .11    | .246 | -.04   | .716 | .19    | .058 | .03    | .744 | -.18   | .066 |
| Specialty          | -.26   | .008 | -.13   | .198 | -.18   | .070 | .00    | .991 | -.07   | .454 | -.04   | .701 |
| Internship year    | -.02   | .817 | .14    | .158 | -.08   | .411 | .01    | .925 | -.16   | .100 | -.13   | .198 |
| Workplace          | -.10   | .309 | .26    | .007 | -.02   | .819 | .24    | .014 | -.06   | .553 | -.16   | .246 |
| Work excesso       | -.19   | .055 | -.06   | .522 | -.04   | .665 | -.08   | .417 | .01    | .930 | -.07   | .476 |
| Hobbies            | -.12   | .216 | -.15   | .115 | -.19   | .050 | -.06   | .567 | -.10   | .317 | -.08   | .417 |
| Physical exercise  | .17    | .091 | .10    | .329 | .09    | .347 | .03    | .751 | -.04   | .669 | .03    | .740 |

$R_s$ – Spearman correlation coefficient; Independ. – Independent; remuner. – Remuneration. Significant differences: $p \leq .10$. 
The higher stress-generator dimensions were ‘dealing with patients’ and ‘overwork’, while the lower stress-generator dimension was ‘career and payment’. Given the recent change in the employment situation of medical specialists to a more precarious reality, it is postulated that this dimension may cause higher levels of stress soon (Shanafelt & Dyrbye, 2012).

Comparing the three specialties, medical residents of Oncology show higher levels burnout and stress than those of Radiotherapy. One possible explanation is that the technical component can reduce the stress caused by contact with patients. Also, the results suggest that Radiotherapy residents adhere more frequently to activities compatible with a suitable coping (Penson, Dignan, Canellos, Picard, & Lynch, 2000).

As in the French study (Blanchard et al., 2010), the stress dimension ‘overwork’ was a strong predictor of burnout. This is consistent with the revision published by (Thomas, 2004), that established the take-home work and its interference with family life great predictors of medical residents burnout (Thomas, 2004). Stress dimensions have proved to be less likely predictable than the burnout dimensions as expected as stress constitutes an inherent individual response and evolution of stress to burnout depends on environmental factors (Thomas, 2004).

Although the present study provided a contribution to an area of knowledge still unexplored in Portugal, it shows some limitations, such as the fact that the study is based on self-registration measurements, which may overestimate the results obtained (Spector & Jex, 1991) and the fact that the translation and validation of the instruments (de Melo Silva & da Silva Gomes, 2009; Melo et al., 1999) were based on normative values of burnout dimensions of the U.S. population (Maslach & Jackson, 1981), as conducted in other studies (Blanchard et al., 2010; Font et al., 2015).

Currently, the results of burnout and stress in the medical population obtained in the cross-sectional studies like ours might be used to build and implement stress management programs or preventive structural reforms that aim to create support groups, the separation of work and personal life and the increase of the sensation of job control (Thomas, 2004).

Figure 1. Relationship between the burnout dimension level 'emotional exhaustion' and the stress dimension level 'work excess'.

![Figure 1](image-url)
One strategy that seems to be useful in the residents is training in communication of bad news as well as in labour management (Blanchard et al., 2010; Shanafelt & Dyrbye, 2012). Another important strategy are effective coping mechanisms, depending on the tastes and personal life of each other (Penson et al., 2000).

**Conclusions**

This study showed that in Portugal the prevalence of burnout is high in residents of Oncology specialties and is directly associated with overwork as a stress dimension. Portuguese Medicine Faculties and Hospitals that receive medical residents should consider this information as a matter of concern and, further, develop prospective studies and interventional strategies to reduce the work load and consequent burnout in young physicians.

**Acknowledgments**

The authors would like to acknowledge Psychology School of University of Minho, to all the contributors of this study, to Catarina Silva from Keypoint, Consultoria Científica Lda. for the medical writing support and to all the survey’s respondents.

**Disclosure statement**

The authors declare that they have no competing interests.

**References**

Blanchard, P., Truchot, D., Albiges-Sauvin, L., Dewas, S., Pointreau, Y., Rodrigues, M., … Soria, J. C. (2010). Prevalence and causes of burnout amongst oncology residents: A comprehensive nationwide cross-sectional study. *European Journal of Cancer, 46*, 2708–2715.

Caplan, R. P. (1994). Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers. *BMJ, 309*, 1261–1263.

Ciammella, P., Fiorentino, A., De Bari, B., Alongi, F., Livi, L., & Filippi, A. R. (2011). 2070 POSTER the ‘BUONGIORNO’ project – An Italian survey on the incidence of burnout among young Italian radiation oncologists. *European Journal of Cancer, 47*, S209.

Dyrbye, L. N., Thomas, M. R., Massie, F. S., Power, D. V., Eacker, A., Harper, W., … Novotny, P. J. (2008). Burnout and suicidal ideation among US medical students. *Annals of Internal Medicine, 149*, 334–341.

Font, A., Corti, V., & Berger, R. (2015). Burnout in healthcare professionals in oncology. *Procedia Economics and Finance, 23*, 228–232.

Gomes, A. R., Cruz, J. F. A., & Cabanelas, S. (2009). Estresse ocupacional em profissionais de saúde: um estudo com enfermeiros portugueses [Occupational stress in healthcare provider: a study with portuguese nurses]. *Psicologia: Teoria e Pesquisa, 25*, 307–318.

Gomes, A. R., Melo, B., & Cruz, J. F. (2000). Estudo do stress e do burnout nos psicólogos portugueses [Study of burnout and stress among portuguese psychologists]. In J. F. Cruz, A. R. Gomes, & B. Melo (Eds.), *Stress E Burnout Nos Psicólogos Portugueses* (pp. 73–130). Braga: SHO – Sistemas Humanos e Organizacionais.

Gonçalves, R., Ferreira, J., Araújo, C., Gonçalves, M., Pedroso, S., & Pinho, C. (2016). Burnout among Portuguese oncology healthcare providers – Differences between pediatric an adult teams. *European Psychiatry, 33*, S148.

Gonzaga, A. L. (2003). A validação do Maslach Burnout inventory em língua portuguesa: um estudo exploratório [The validation of Maslach Inventory in portuguese: an exploratory study]. http://tede.fecap.br:8080/jspui/handle/tede/686
Grunfeld, E., Whelan, T. J., Zitzelsberger, L., Willan, A. R., Montesanto, B., & Evans, W. K. (2000). Cancer care workers in Ontario: Prevalence of burnout, job stress and job satisfaction. *Canadian Medical Association Journal, 163*, 166–169.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Organizational Behavior, 2*, 99–113.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52*, 397–422.

Melo, B. T., Gomes, A. R., & Cruz, J. F. A. (1999). Desenvolvimento e adaptação de um instrumento de avaliação psicológica do burnout para os profissionais de psicologia [Development and adaptation of a psychological evaluation instrument of burnout to Psychology professionals]. In A. P. Soares, S. Araújo & S. Caires (Orgs.), *Avaliação psicológica: formas e contextos* (Vol. VI, pp. 596–603). Braga:APPOR e Universidade do Minho.

de Melo Silva, M. da C., & da Silva Gomes, A. R. (2009). Stress ocupacional em profissionais de saúde: um estudo com médicos e enfermeiros portugueses [Occupational stress in healthcare providers: a study with Portuguese medical doctors and nurses]. *Estudos de Psicologia (Natal), 14*, 239–248.

Olkinuora, M., Asp, S., Juntunen, J., Kauttu, K., Strid, L., & Äärimaa, M. (1990). Stress symptoms, burnout and suicidal thoughts in Finnish physicians. *Social Psychiatry and Psychiatric Epidemiology, 25*, 81–86.

Penson, R. T., Dignan, F. L., Canellos, G. P., Picard, C. L., & Lynch, T. J. (2000). Burnout: Caring for the caregivers. *The Oncologist, 5*, 425–434.

Shanafelt, T., & Dyrbye, L. (2012). Oncologist burnout: Causes, consequences, and responses. *Journal of Clinical Oncology, 30*, 1235–1241.

Spector, P. E., & Jex, S. M. (1991). Relations of job characteristics from multiple data sources with employee affect, absence, turnover intentions, and health. *Journal of Applied Psychology, 76*, 46–53.

Theorell, T. (2000). Changing society: Changing role of doctors. *BMJ, 320*, 1417–1418.

Thomas, N. K. (2004). Resident burnout. *Jama, 292*, 2880–2889.

Whippen, D. A., & Canellos, G. P. (1991). Burnout syndrome in the practice of oncology: Results of a random survey of 1,000 oncologists. *Journal of Clinical Oncology, 9*, 1916–1920.