

# Burnout Syndrome among Doctors in Greek Oncology Departments

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## Abstract

**Objective:** Economic crisis and austerity has dramatic consequences for health care professionals' mental health. This study aimed to investigate the prevalence of burnout syndrome among doctors working in public or private oncology departments in Greece and its association with factors determined by economic crisis.

**Method:** Medical or radiation oncologists who are members of the National Oncology Societies and practicing oncology at least for one year were enrolled in this study. An On-Line questionnaire consisting of the Maslach Burnout Inventory and an informative questionnaire was utilized.

**Results:** Eighty-six On-Line questionnaires were analyzed. Radiation oncologists had significantly higher Depersonalization (DP), whereas medical oncologists had significantly higher Emotional Exhaustion (EE) scores. Registrars had higher scores compared to consultants in all subscales of the burnout syndrome. Factors such as "hospitals are not safe due to the lack or reductions in medical supplies and personnel shortage" and "receiving less than 50% of annual leave" were associated with significantly higher levels of EE. Factors such as "not afraid of moving abroad" and "receiving 100% of annual leave" were associated with significantly higher levels of low Personal Accomplishments (PA). The principal component analysis yielded three principal components: 'future insecurity', 'feeling secure while working' and 'working conditions associated with burnout syndrome.'

**Conclusion:** Several factors associated with austerity resulting from economic crisis significantly influenced prevalence of burnout syndrome among oncologists in Greece. Further studies need to be conducted to mobilize policy makers to develop and implement policies to improve oncologists' mental health.

**Key words:** *Burnout Syndrome; Economic Recession; Greece; Oncology*

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**B**urnout syndrome is defined as a situation which is observed within working environments with excessive workload demands and increased sense of responsibility. Its negative impact on wellbeing, in terms of both physical and psychological status, has generated enormous interest and has become a major issue of public concern (1, 2). According to the World Health Organization's (WHO) International Classification of Diseases (ICD), burnout syndrome (coded as "Z73.0, Problems related to life management difficulty") is defined as a "state of vital exhaustion" and it includes mental and physical exhaustion related to stress at work (3).

The burnout syndrome is defined by three subscales: loss of motivation for work with feelings of helplessness (emotional exhaustion (EE)), detached behavior and cynicism (depersonalization or DP) and lack of sense of personal achievements with reduced productivity and withdrawal from responsibilities (personal accomplishments (PA)) (4). Its main cause is the chronic exposure to stressors such as quantitative work overload, unfamiliarity with situations and sense of lack of control, insufficient support and unsuccessful communication (5, 6).

The burnout syndrome affects individuals regardless of their age or occupation. The risk of experiencing this psychophysical pathology is higher among health care professionals including doctors, nurses, medical students and registrars (7-10). The consequence of this syndrome is impaired quality of health care services provided by the institutes due to decreased utilization of their workforce (11). Its prevalence has increased among cancer care professionals throughout the world with approximately one third of the cancer care professionals' exhibiting symptoms of burnout syndrome (12). Possible reasons are: bad working conditions, bad relationships among staff members, increased workload, reduced vacation time, low confidence, level of position, lack of appropriate training to deliver bad news and insufficiency of skills such as compassion, empathy and communication skills, which are significant in cancer population care (12-14). Burnout syndrome is associated with poor patient care, decreased concentration, increased medical errors, reduced patient satisfaction, increased hospital turnover and difficulty in retaining staff, hostile attitude towards patients and increased risk in developing physical and psychological health problems such as anxiety, insomnia, depression, sense of failure, thoughts of suicide, and drug and alcohol addiction (13-15). It starts at early stages of medical training and worsens during practice (16, 17). Adverse working conditions and lack of career advancement options may exacerbate occurrence of burnout syndrome (18).

Multiple risk factors are associated with increased susceptibility for development of burnout syndrome among oncologists. On daily basis, oncologists are faced

with life and death decisions much more frequently compared to physicians in other specialties. Continuous exposure to fatal illnesses with limited success in curing them, prolonged working hours with more administrative time demands, limited autonomy over daily responsibilities, endless electronic documentation requirements, and a shifting medical landscape seem to be making oncologists more vulnerable to suffering from burnout syndrome. Evidence suggests that burnout syndrome can impact quality of care in a variety of ways and have potentially profound personal implications (19). Risk factors can be categorized into demographic, workplace and work/life balance categories. Among demographic factors, younger age, living alone, lack of access to support services, and being a young oncologist have been found to be related to burnout syndrome (2, 20). The workplace-related factors include increased workhours, administrative workload, and reduced meaningful professional activity such as research and educational time (21-24). Significant loss of physician independence, excessive time spent on clerical work and stressful experiences in delivering bad news to cancer patients have also been associated to burnout among oncologists (25-27). Impaired work/life balance occurs when quality time away from work such as vacation time, time for hobbies, and time for family becomes increasingly inadequate (2, 28). All additional work-related tasks at home such as reading emails and assessing electronic medical records have also been associated with higher levels of burnout syndrome (29). Several studies demonstrated association between economic crisis and aspects concerning mental health (30-42) (self-reported poor mental health, depression (30,32,34-36,39), anxiety (30,34-36,39), dysthymia (32,34,36), suicide (37,38,41,43)), general health (43-46) and one aimed to explain how the crisis has led to policy changes concerning the health care system of different countries and how these changes may have affected the population's health (31). All studies demonstrated an increased prevalence of these clinical conditions together with the outbreak of economic crisis and the rising rate of unemployment. Ten Have *et al.* (39) identified low decision latitude, high psychological job demand, low job security, and low coworker support as factors related to mental health problems. In general, the economic crisis has worsened the health of workers and the general population (47). The main cause for this was work-related stress. The rise in layoffs and budget cuts brought survivors toward higher job insecurity, increased fear of becoming unemployed, and the consequent increase in stress (45). The work-related stress also increases due to reorganization of work, which brings increased workload, increased number of shifts, and hours of work (35). In addition, many workers have suffered from reduction in wages (30) resulting in development of work dissatisfaction that can lead to burnout syndrome (31).

In Greece, the economic changes imposed after 2010, when the Memorandum of Economic and Financial Policies was signed, dramatically affected public healthcare services. There is evidence of 15% cuts in all public sector salaries, abolished thirteenth and fourteenth month salary and 10% cuts in pensions by law. Furthermore, the public hospitals operate with 10-40% fewer workers (48). These factors remarkably affect quality of health care services provided as they have led to high levels of job dissatisfaction and burnout syndrome (48). Austerity seems to be emerging as a prognostic risk factor for burnout syndrome as workers are subjected to higher levels of stress (49). Even though literature suggests that austerity has dramatic consequences for public health and health care services, to the best of our knowledge, no quantitative data that examines incidence of burnout syndrome among doctors in Greek oncology departments and their correlation with factors resulting from austerity are available (48,49).

The main objective of the current study was to evaluate burnout syndrome amongst oncologists in oncology departments in Greece and its association with factors related to austerity, utilizing an On-Line questionnaire. The secondary objectives are to identify potential factors of burnout syndrome related to working practices (working hours, years in profession, night shifts), financial factors (salary, pay cuts, fixed costs) and factors resulting from austerity (shortage of supplies and medical staff, unemployment), as well as to evaluate their correlation between severely affected subscales of burnout syndrome.

## **Materials and Methods**

### **Study Tools**

A cross-sectional study was performed, where the participants were asked to answer an On-Line questionnaire consisting of two separate questionnaires: The Maslach Burnout Inventory (MBI) questionnaire (see Appendix 2) and an informative questionnaire (see Appendix 1) which included socio-demographic characteristics and work-related conditions.

The MBI questionnaire was first described in 1981 by Maslach and his colleagues (50). It is the most widely used, standardized and validated measure of burnout syndrome, as it has strong psychometric properties and it is considered as the “gold standard” for assessment of burnout syndrome in health care professionals. It comprises a 22-statement tool on job-related feelings that evaluate three subscales of burnout syndrome, enabling researchers to categorize participants as minimally, moderately or severely affected (Table 1). The respondents answer according to their perceived frequency of occurrence, ranging from never to every day (on a corresponding scale from 0 to 6). The three subscales; EE, DP and PA are scored separately. Specifically, high scores on the EE (> 27) and/or DP (> 10) subscales and/or a low score for PA (< 33) indicate

severe burnout syndrome (Table 1) (50). A subject suffers from burnout syndrome when at least one of the three subscales is severely affected (51).

The second questionnaire included demographic data and job-related data associated with austerity as follows: (i) personal details: age, gender, marital status, annual leave (< 50%, 50-100%, 100%), salary, fixed costs per month, (ii) academic education: M.Sc. title, Ph.D. title, involved in medical education activities, (iii) job status: kind of specialty (radiation oncologist, medical oncologist), workplace (academic staff, national health system, private doctors), occupational status (registrars, consultants), type of contract (permanent, fixed terms), years of experience (< 10, 10-20, ≥ 20 years), reasons for choosing the current job, night shifts (< 5, ≥ 5), work hours per week (< 50, ≥ 50 hours), workplace safety, safe environment for the patient, medical supplies shortage, staff shortage, pay cuts, iv) level of satisfaction for job-related factors: good working conditions, happy with salary, continuous professional development opportunities, satisfied with directors, mentor support and guidance, future insecurity, fear of having to move abroad, fear of being unemployed, or getting involved in medical errors. This questionnaire was reviewed and revised by all Greek researchers (MP, MS, VM, DK) to ensure its clarity and interpretation. It was constructed to provide information regarding some potential prognostic factors related to health care services, found in the literature, that are mainly affected by the economic crisis (47). Thus, it is considered reliable for use as a tool for evaluation of prevalence of burnout syndrome among oncologists working in Greek hospitals. The reliability of the questionnaire was assessed via internal consistency using Cronbach's alpha coefficient.

Association of burnout syndrome with healthcare related outcomes (medical error, malpractice, suboptimal patient care, lower medical knowledge, staff turnover and retirement, suboptimal professionalism), personal outcomes (alcohol abuse, suicidal ideation, future competence, lower satisfaction) and health care system characteristics (practice setting, work hours, clerical burden, specialty) outcomes was investigated.

### **Sample Population**

Approval was obtained from the Ethics Committee of Research at University of Southampton. The study was conducted by means of an On-Line questionnaire, that included two separate questionnaires described above, the link for which was provided to the participants' professional emails. This email also included an invitation for the participants, a sheet providing information about the objectives of the study and a confidentiality statement regarding the anonymity of their responses. A total of 300 On-Line questionnaires were sent over a period of three months. Overall, two emails were sent to the participants within a two months' interval.

In order to avoid duplications in answers, the link for the On-Line questionnaire was set-up in such a way that

each participant was able to respond only one time. All questions in sections one and two of the On-Line questionnaire were in a multiple choice format with two to six options and only one possible answer was available. The questionnaire was distributed to oncologists across different areas of the country to avoid any bias in selection of a sample population. However, the sample resulting from a population-based study (oncologists) was likely to be representative of the population, thereby minimizing selection bias. The use of random sampling across oncologists meant that selection bias was minimized even further. On the other hand, the sample would have been prone to a non-response bias. However, any differences in socio-demographic characteristics would have been difficult to quantify because limited information would have been available for those who were selected but refused to be part of the study compared to those who participated. The population of interest included all practicing oncologists (consultants and registrars) who were registered in one of the three official Greek Oncology Associations: the Hellenic Society of Medical Oncology (HeSMO), Hellenic Society of Radiation Oncologists (EEAO) and Hellenic Society of Geriatric Oncology (EEIO) and were employed either with fixed terms or permanent contracts in Greece at least for one year (300 members). Oncologists working in the three different levels of the national health care delivery system (tertiary, secondary and primary health care services), as well as working in private hospitals and clinics or as academic staff were enrolled in this study. Registered oncologists who were practicing abroad were excluded from the study as they were informed regarding the eligibility selection criteria. In order to increase response rate, the presidents of the above Oncology Associations endorsed the study.

### **Statistical Analysis**

Once the participants completed the On-Line questionnaire, the data were saved online in a Microsoft Excel spreadsheet. Descriptive statistics were used to present the data. Mean values for EE, DP and PA subscales scores for all prognostic factors were calculated. Comparisons among the subscales were performed using the independent sample t-tests. Principal component analysis (PCA) was also performed to identify potential socio-demographic and job-related data associated with burnout syndrome among the participants. The scree plot was used to determine the number of components associated with burnout syndrome, while the components were rotated using the varimax procedure. Power analysis was conducted to assess the validity of the number of participants for every comparison performed. Effect sizes  $> 0.8$  were considered "large" according to Cohen (52). Multiple regression analysis was also performed to analyze the association of two or more prognostic factors with the predicted score in the subscales of the burnout syndrome. Statistical analysis was performed using the

SPSS statistical package (IBM, SPSS statistics v 21.0). A P-value  $< 0.05$  is considered as the threshold value of statistical significance.

### **Results**

Ninety out of three hundred physicians completed the On-Line questionnaire. Four participants who had at least one missing response were excluded. A total of 86 questionnaires were analyzed. The response rate was 30%. The main reasons associated with low response rate are the short time period (three months) to conduct the study and the fact that most oncologists who were approached via email did not agree to take part. The flow diagram of the participants is presented in Figure 1. The socio-demographic characteristics of the participants are presented in Table 2. 65 of the responders (75.6%) worked in the National Health System (NHS), 8 were academic staff (9.3%) and 13 (15.1%) were practicing in the private health care sector. 53 of the participants were medical oncologists (61.7%) and 33 were radiation oncologists (38.3%). 65 of the participants were consultants (75.6%) and 21 were registrars (24.4%). 61.7% of the participants were practicing up to ten years in oncology, 41.9% had a PhD degree, 48.8% had permanent contracts and 51.2% were working more than 50 hours per week (Table 2). The main reason for choosing a career in oncology was the satisfaction of giving (61% - 54 participants) and only 9% had chosen this specialty for economic benefits. Power analysis revealed that all effect sizes of our comparisons were  $> 0.8$ . This enabled us to confidently consider the population sample as sufficient for detecting lack or presence of differences correctly among the three subscales of the burnout syndrome for all possible prognostic factors.

The mean scores for each subscale of burnout syndrome for each possible investigated prognostic factor are presented in Table 3. Overall, 41.6% of the participants had high scores on EE and DP, whereas 61.6% had a high score on PA. Among medical specialists, a percentage between 23 - 75% reported severely affected scores in one subscale of the burnout syndrome, whereas a percentage between 8.8 - 22.6% reported pathological scores in all subscales (Table 4). Academic staff reported higher mean scores of EE, DP and lower mean scores for PA compared to other groups (29, 10.12, 32.6 vs 23.6, 9.7, 35.5 for NHS vs 23.3, 9.6, 36 for private doctors) (Table 3). 12.5% of the academic staff, 13.8% of the NHS staff, as well as 23.1% of the private doctors reported three severely affected subscales of the burnout syndrome (Table 4). However, these differences were not statistically significant (Student's t-test,  $P > 0.05$ ).

When comparing the two specialties, the radiation oncologists had higher mean scores of DP (18 vs 11), whereas medical oncologists had higher mean scores of EE (27 vs 19) (Table 3). Medical oncologists were two times more likely to suffer in all subscales of burnout syndrome compared to radiation oncologists (19.2% vs

8.8%) (Table 4). The differences for EE and DP between the two groups were statistically significant ( $P = 0.002$  and  $P = 0.001$ , respectively). Regarding the occupational status, registrars reported higher mean scores of EE, DP and PA (27.9 vs 22.7, 11.3 vs 9.2, 34.9 vs 34) compared to consultants (Table 3). 18.2% of the registrars suffered from the most severe type of burnout syndrome (three subscales severely affected) (Table 4). However, medical oncologists and consultants showed a lower percentage in the case of one subscale severely affected compared to radiation oncologists and registrars, respectively (Table 4). In addition, the participants who received less than 50% of their annual leave had significantly higher mean scores of EE (28 vs 20) ( $P = 0.016$ ) compared to those who received > 50% of their annual leave, while those who received 100% of their annual leave had significantly higher levels of low PA (33 vs 37) ( $p = 0.046$ ) compared to those who received < 100% of their annual leave (Table 3).

Regarding the concept of workplace safety, the participants who believed that their hospitals are not safe had significantly higher mean scores of EE (25.7 vs 22.7) ( $P = 0.013$ ). Regarding the influence of medical supply-personnel shortage, the participants who were experiencing severe reductions suffered from significantly higher levels of EE (29.4 vs 20.4) ( $P = 0.001$ ). Participants who admitted that they were involved in medical errors were suffering from higher levels of DP (11 vs 9) and PA (33.5 vs 35.7) ( $P = 0.087$ ). The responders who were not afraid of moving abroad, due to unemployment, had significantly lower mean scores of PA (32 vs 36) ( $P = 0.013$ ), indicating that they were more fearless to claim from the authorities that they deserved better.

Parameters such as years in profession, working hours per week, night shifts, type of contract, salary adequacy, working environment, future expectations, relationship with colleagues and career opportunities were not significantly correlated with any of the subscales of the burnout syndrome when analyzed individually. However, a larger sample of participants might be needed to extract more accurate results about the influence of the above parameters in experiencing burnout syndrome.

In the PCA, based on the screen plot, three components were found and accounted for 43.8% of the variability. The first component accounted for 18.7% of the variability and can be labeled as future insecurity since it included factors such as few years in profession, fixed term contract, fear of unemployment, fear of moving abroad, non-PhD holders and registrars. The addition of the second component resulted in 31.4% of the variability and can be labeled as feeling secure while working since it included variables such as confident about not making medical errors, good working conditions, cooperation with colleagues, and mentor's support. The third component can be labeled as working conditions since it included factors like working hours, occupational status, night shifts, salary adequacy and annual leave. Multiple regression analysis also supported that dividing the parameters into these three groups is the optimal way to create useful models to explain the data and overcome the challenges that this dataset poses for multiple regression analysis (e.g. several parameters examined, multiple potential combinations of parameters to include, multiple categorical parameters, and multiple collinearities).

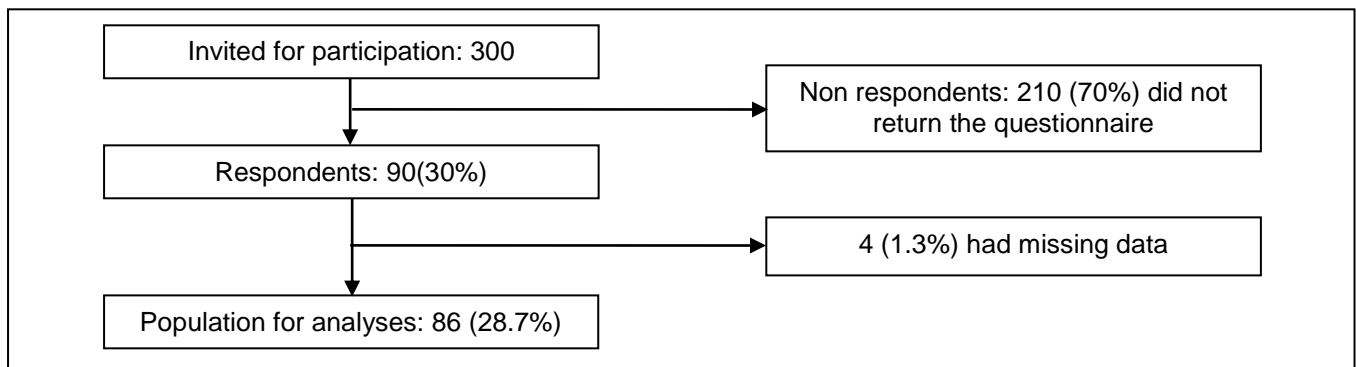


Figure 1. Flow Diagram of the Participants (Greek Oncology)

Table 1. Scores of Minimal, Moderate and Severe Burnout Syndrome in Greek Oncology (50)

Subscale	Minimal	Moderate	Severe
Emotional Exhaustion (EE)	≤ 20	21-27	≥ 27
Depersonalization (DP)	≤ 5	6-10	≥ 11
Personal Accomplishments (PA)	≥ 42	41-34	≤ 33

**Table 2. Socio-Demographic Data of the Participants (Greek Oncology)**

Specialty	Medical oncologists	53 (61.7%)
	Radiation oncologists	33 (38.3%)
	Academic staff	8 (9.3%)
Workplace	National Health system (NHS) staff	65 (75.6%)
	Private doctors	13 (15.1%)
Occupational status	Registrars	21 (24.4%)
	Consultants	65 (75.6%)
Academic education	MSc holder	18 (20.9%)
	PhD holder	36 (41.9%)
	None	32 (37.2%)
Experience	< 10years	53 (61.7%)
	10-20years	15 (17.4%)
	> 20years	18 (20.9%)
Contract	Permanent	42 (48.8%)
	Fixed terms	44 (51.2%)
Working hours	< 50 hours	42 (48.8%)
	> 50 hours	44 (51.2%)

**Table 3. Mean Scores in each Subscale of the Burnout Syndrome for All Possible Prognostic Factors**

		Emotional Exhaustion (EE)	Personal Accomplishments (PA)	Depersonalization (DP)
Workplace	Academic staff	29 (37.5%)	32.6(50%)	10.12(50%)
	National Health System (NHS) staff	23.6 (43%)	35.5 (33.4%)	9.7 (40%)
	Private doctors	23.3 (38.5%)	36 (46.2%)	9.6 (46.2%)
Occupational status	Registrars	27.9	34.9	11.3
	Consultants	22.7	34	9.2
Oncologists*	Medical	27	34	11
	Radiation	19	34	18
Experience	10year	24	34	10
	10–20year	21	36	8
	> 20years	27	34	10
Contract	Permanent	23	35	9
	Fixed terms	24	34	10
Working hours per week	< 50	23	34	9
	> 50	24	34	9
Happy with salary	Yes	23	34	9
	No	25	34	10
Nightshifts	Up to 5	24	35	9
	More than 5	24	34	10
Annual leave**	< 50%	28	37	9
	50-100%	24	33	11
	100%	20	33	8.5
Good working conditions	No	26	35	10
	Yes	21	34	9
Satisfied with director	Yes	22	35	10

	No	27	34	6
Future insecure	No	22	36	9.6
	Yes	25.6	33.4	9.8
Fear of moving abroad***	Yes	24	36	10
	No	23	32	9
Safety in workplace****	Yes	22.7	35.7	9.4
	No	25.7	33	10
Safe environment for patient	Yes	21	35	9
	No	28	33	10
Involved in medical error	Yes	24.7	33.5	11
	No	23	35.7	9
Supply and personnel shortage*****	No	20.4	34	9.3
	Yes	29.4	35.6	10.4
Fear of being unemployed	Yes	22.7	35	9.4
	No	26.4	33.7	10

\* p = 0.002 and p = 0.001 for EE and DP, respectively.

\*\* p = 0.016 for EE when comparing < 50% and > 50%, and p = 0.046 for PA when comparing 100% and < 100%.

\*\*\* p = 0.013 for PA

\*\*\*\* p = 0.013 for EE.

\*\*\*\*\* p = 0.001 for EE.

**Table 4. Correlation between the Number of Subscales Severely Affected and Possible Prognostic Factors**

Factors Examined	1 Affected Subscale†	2 Affected Subscales‡	3 Affected Subscales‡
Academic staff	75%	12.5%	12.5%
National Health System (NHS) staff	46%	30.8%	13.8%
Private doctors	23%	23.1%	23.1%
Registrars	36.4%	36.4%	18.2%
Consultants	48.4%	25%	14.1%
Medical oncologists	34.6%	36.5%	19.2%
Radiation oncologists	61.8%	14.7%	8.8%
MSc holder	50%	22.2%	11.1%
PhD holder	41.7%	30.6%	22.2%
10 years experience	40.4%	32.7%	11.5%
10-20 years experience	62.5%	31.3%	6.3%
> 20 years experience	44.4%	33.3%	11.1%
Permanent contract	50%	28.6%	14.3%
Fixed terms contract	40.9%	27.3%	16%
< 50 working hours per week	47.7%	25%	18.2%
> 50 working hours per week	42.9%	31%	12%
Happy with salary	47.7	22.7%	18.2%
Not happy with salary	42.9%	33.3%	12%
Up to 5 nightshifts	50%	25%	16.7%
More than 5 nightshifts	39.5%	31.6%	13.2%
< 50% of annual leave	31.8%	31.8%	18.2%
50-100% annual leave	41.7%	33.3%	13.9%
100% of annual leave	60.7%	17.9%	14.3%
Not good-bad working conditions	52.2%	30.4%	13%

Good working conditions	37.5%	25%	17.5%
Satisfied with director	43.6%	30.9%	10.9%
Not satisfied with director	48.4%	22.6%	22.6%
Confident for future	48.6%	21.6%	16.2%
Future insecure	42.9%	32.7%	14.3%
Fear of moving abroad	46.5%	25.6%	20.9%
Not fear of moving abroad	44.2%	30.2%	9.3%
Safety in workplace	41%	36%	10.3%
Not safe in workplace	48.8%	21.3%	20%
Safe environment for patient	52.7%	23.6%	14.5%
Not safe environment for the patient	32.3%	35.5%	16.1%
Involved in medical error	42.9%	35.3%	11.8%
Not involved in medical error	47%	25.7%	11.4%

†Subscales refer to the three dimensions of the burnout syndrome: Emotional Exhaustion (EE), Depersonalization (DP) and Personal Accomplishments (PA). The first column includes the percentages of the participants who have at least one dimension severely affected, whereas the second and the third column show percentages of those participants who have any two or any three dimensions affected, respectively. One suffers from burnout when at least one dimension is severely affected.

## Discussion

Burnout syndrome is a stressed-induced occupational disease that has been identified in demanding jobs such as social work, teaching, and health care (7-10). The Greek health care system is in a deep crisis, with staff shortage, medical supply shortage, limited financial inputs, as well as managerial ineffectiveness (53). Presently, it is supported mainly by the country's NHS, partially by the private sector and to a lesser extent by insurance organizations, which function as bilateral monopolies similar to the health care system in the U.S (49, 54). Due to the lack of co-operation between these health care providers, crucial organizational and structural problems are generated (49, 54). As with other countries of southern Europe, the Greek health care system is passing through a transitional period in which job and educational circumstances are continuously reforming (14). Policies of health care providers are being reorganized and the old traditional roles of health professionals are being criticized and re-evaluated (14, 55).

Within the context of stringent austerity in Greece after 2010, it has been reported that almost 40% of public hospital budgets were cut, leaving health care professionals with reduced medical supplies and job uncertainty (31, 48). Furthermore, substantial cuts in medical expenditure have been made, including a 20-30% cut in salaries of the health care workforce, limiting recruitment of personnel and increasing retirement age, while at the same time more patients are choosing public health care services, mainly due to the fact that they can no longer afford costly private health care services (31, 48). Dyrbye and Shana felt reported that burnout syndrome is strongly associated with increased workforce turnover, which results in financial problems and affects the institution's organizational productivity (56). Better understanding of the relationship between

burnout syndrome and staff turnover intentions is of critical importance to ensure retention of the workforce moving forward (57). This information may be helpful to identify and prevent burnout and consequently to improve the well-being and retention of doctors early in their careers (58). Two types of interventions have been proposed: the individual-focused (such as mindfulness and exercise) and organization-directed (such as reducing workload, changing shift patterns, organizing group sessions to enhance teamwork) (57). Panagiotis *et al.* reported that organization-directed strategies significantly reduced burnout syndrome compared to individual-focused strategies (59). In a recent study, Montgomery *et al.* reported that developing a healthy workplace could contribute to effectively tackling burnout syndrome (60).

The goal of the PCA analysis was to reduce the number of substantial intensity measurements to a small number of principal components that justify most of the data variation (69). In this study, the PCA yielded three principal components that we named 'future insecurity', 'feeling secure while working' and 'working conditions' justifying high variance percentage. These three components accounted for 43.8% of the data variance.

In general, primary health care and preventive policies are not applied in Greece. A recent study has demonstrated the need for an increase of 619% in number of general practitioners to establish a strong and reliable primary health care system in Greece (49). In another study, which took place after the rescue package that the board of creditors implemented in Greece, burnout syndrome in workers was positively associated with medical supply shortage (31). It is also demonstrated that EE and DP subscales of burnout syndrome correlated with insufficient rest after a night shift (31). Comparable results were also found in other studies, where the weekly working hours and the number



of night shifts significantly correlated with burnout syndrome in subscales of EE and DP (61). In a recent study, longer work hours ( $\geq 60$  h/week) were found to be significantly associated with both high EE and DP among Irish oncologists (62). However, in this study, work hours and number of night shifts were not found to be of statistical significance in developing burnout syndrome due to the fact that the study population was small and the night shifts in oncology departments are not so demanding as in other specialties such as surgery. According to the European work time directive which has been recently implemented, the trainee doctors in Greece are facing the risk of unemployment since vacant positions generated by early retirements would not be filled because of the economic crisis (48,63). It is estimated that about one third of recent medical doctor graduates will remain unemployed, while both trainee and practicing doctors will have to work overtime with fewer resources, fewer days off, more night shifts and lower salaries (63). These discouraging conditions have resulted in a large portion of medical students to consider applying for a medical residency in other countries like Germany, Switzerland, United Kingdom and Scandinavia (49). This is also due to the administrative inefficiency that leads talented professionals to work in workplaces with duties and responsibilities that are often like those of unskilled non-educated ancillary staff (14).

A large multi-institutional study investigated the prevalence of burnout syndrome among medical residents in eight major Greek hospitals (49). A high prevalence of burnout syndrome was found among residents with almost half meeting the criteria of burnout syndrome and 30% suffering from three of its subscales. It was also reported that job insecurity was strongly associated only with EE and not with DP and PA. Qualitative analysis of the data demonstrated that most of the residents felt that their training involved too much trivial routine paperwork and this also strongly correlated with burnout syndrome (49). In this study, approximately 20-40% of the oncology registrars were severely affected in one, two or three subscales of burnout syndrome. According to Maslach and Jackson, burnout syndrome is more likely to occur in younger individuals within the first years of their career (50). Additionally, Ramirez *et al.* reported that individuals younger than 55 years old were at a relatively higher risk to exhibit EE and DP (27), while Banaerjee *et al.* reported that 71% of oncologists  $\leq 40$  years showed evidence of burnout (burnout subscales: DP 50%; EE 45%; PA 35%) (2). The above are in line with our results considering the registrars, which were severely affected with EE and DP compared to the consultants (Table 3). However, it should be noted that 71.3% of oncologists did not respond to the questionnaires, and this actually might result in different prevalence of burnout syndrome. Additionally, job insecurity was associated with PA, whereas fear of moving abroad, reduced

vacations, workplace safety, medical staff and supply shortage were strong contributors in developing EE. Furthermore, involvement in medical errors correlated with higher levels of DP and PA. This might be due to fatigue resulting from unlimited hours of work, extra night shifts due to staff shortage, as well as developing stress while working under conditions with time pressure. Shanafelt *et al.* reported that burnout syndrome is an independent factor of self-reported perceived medical errors (64). In a recent study, Bourne *et al.* reported that consultants are three times more likely to avoid cases or procedures and overprescribe compared to trainees due to the fact that they have the ultimate responsibility for patient care and are simultaneously "less protected" by legislation in case of a medical error (57).

A systematic review and meta-analysis of studies evaluating presence of burnout syndrome in cancer care professionals revealed that a severe syndrome in anyone of the three subscales varied from 8 to 51% (12). Similar results were obtained from a study amongst radiation oncologists in Australia and New Zealand, in which 48.5% of respondents were severely affected in at least one of the three subscales (65), while 3.4% of the radiation oncologists of the Kyoto Radiation Oncology Study Group (KROSG) were affected in all subscales of burnout syndrome and 20.6% reported a high score for either EE or DP (66). Additionally, a high score in EE combined with a high DP and/or low PA was identified in 45% of consultants and 20% of specialist registrars in Ireland (62), while in the US, 44.7% of oncologists (67), 34.1% of oncology fellows (20) and 32% of the gynecology oncologists (68) were burned out in the three domains. In this study, 61.8% of radiation oncologists were severely affected in one subscale, 14.7% in two subscales, and 8.8% in three subscales. The corresponding results for medical oncologists were 34.6%, 36.5% and 19.2%, respectively.

To our knowledge, burnout incidence among cancer physicians in Greece has not been investigated. Even though some studies concluded that the economic crisis is a possible causative factor, there is no study investigating this correlation in regards to burnout syndrome (31, 48, 49). In this study, the informative questionnaire focuses on job-related factors that are directly affected by the economic crisis such as pay cuts, working conditions, medical supply shortage and fear of moving abroad due to unemployment. It provides a baseline regarding presence of burnout syndrome among oncologists in Greek hospitals. The results of this study in combination with those of previous studies could contribute to prospective investigation of burnout syndrome causative factors.

The study was population based. The sample was obtained from a defined population (oncologists working in Greece). A sample resulting from a population-based study is therefore likely to be representative of the population, thereby minimizing the selection bias and

the results can be generalized to the population that the sample is meant to represent. This is in contrast to a sample from a hospital since such a sample would probably be systematically different from the population. In this case, selection bias exists and results in lack of external validity.

### Limitations

The main limitation of this study was the low the response rate (28.7% - 86 participants) that resulted in a small sample size, which does not permit extraction of definite conclusions for prevalence of burnout syndrome in the whole population in question. It is plausible that oncologists most affected by burnout may have avoided participating in the survey and conversely those least impacted may not have seen its value which could overestimate the results. Further studies are needed to this end, including a larger sample of participants that will provide the possibility to perform regression analysis. Finally, a limitation of a cross-sectional study is that it cannot take into consideration variability of symptoms over time, which may be affected by other personal factors. However, the participants reflected a representative percentage of cancer care workers with respect to their professional status. Thus, the results can be considered as a baseline for evaluation of prevalence of burnout syndrome among physicians in Greek oncology departments (53).

### Conclusion

Burnout syndrome is common among doctors in oncology departments in Greece. Our results showed that 46% of the oncologists work at NHS and 75% of the academic staff had a high burnout level in at least one of the subscales. Medical Oncologists and consultants seem to be at greater risk for

most severe burnout compared to radiation oncologists or registrars albeit they showed a lower percentage in the case of one subscale for severely affected. Those oncologists who receive < 50% of their annual leave, those that feel unsafe in the work place or fear moving abroad, as well as the ones not satisfied with directors also seem to be at greater risk for the most severe burnout syndrome. The PCA suggests that feeling insecure about the future, feeling insecure at work and being unsatisfied with the working conditions are the three most important predisposing factors for burnout syndrome. The high levels of burnout reported in this study compared to results from similar studies in other countries affected by economic crisis may create great concerns about the mental health of health care professionals. Greece is within the eye of the financial storm and policy makers are mainly struggling to protect the financial sustainability rather than maintaining the basic levels of quality in health care services. Health care professionals need to be supported both emotionally and physically with respect to the severe changes austerity has brought affecting the structure and the function of public hospitals and to avoid or get over the burnout syndrome. Future studies investigating the burnout syndrome amongst doctors in various institutions in Greece will help mobilize practitioners and policy-makers on the potential risk of this health problem and to consider, develop and implement policies to improve physicians' mental health.

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### Conflict of Interest

None.

### Appendix 1. Questionnaire Regarding Incidence of Burnout Syndrome in Oncology Departments

1. Gender:
  - a. Male
  - b. Female
2. Age:
  - a. Up to 35
  - b. 36-45
  - c. 46-55
  - d. 56 or older
3. I am:
  - a. Radiation Oncologist
  - b. Medical Oncologist
4. I am:
  - a. Registrar
  - b. Consultant
5. I work in:
  - a. Private Sector
  - b. Academic Sector
  - c. Public Sector
6. I have:
  - a. M.Sc.
  - b. Ph.D.
  - c. I don't have post graduated studies
7. Marital Status:

- a. Married
  - b. Divorced
  - c. Single
8. Years in profession:
- a. Up to 10 years
  - b. 10-20 years
  - c. 20-30 years
- In question 9, you can choose more than one answers:
9. Main reason for choosing oncology as specialty:
- a. Reputation
  - b. Economic Benefits
  - c. I like to offer
  - d. My family forced me
  - e. Other
10. Type of job
- a. Permanent
  - b. Fixed Term
11. Working hours per week:
- a. 40 hours
  - b. 40-50 hours
  - c. More than 50 hours
12. Number of night shifts per month?
- a. 3-4
  - b. 5-6
  - c. More than 6
13. Is the annual leave you take enough for your rest?
- a. Yes
  - b. No
14. Do you believe that your salary is sufficient, regarding the amount of hours you work?
- a. Yes
  - b. No
15. Is your monthly salary enough to cover your fixed costs?
- a. Yes
  - b. No
16. Are you satisfied from your working environment?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
17. Are you satisfied from your cooperation with your colleagues?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
18. Are you satisfied from your senior, regarding the opportunity that gives you to develop your skills and your knowledge?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
19. Do you feel safety regarding your future career?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
20. Are you stressed that you will lose your job, regarding the current economic recession?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
21. Are you stressed that you will have to move abroad, regarding the current economic recession?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
22. As far as the stress is concerned:

- a. I don't have stress
  - b. I seek pharmaceutical help
  - c. I smoke very much
  - d. I consume large amounts of alcohol every day
  - e. I don't know how to deal it
23. Did you have to work in conditions where medical supplies shortage was a real phenomenon?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
24. Do you believe that your working environment is safe for you?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much
25. Do you believe that your working environment is safe for your patients?
- a. Not at all
  - b. Little
  - c. Quite a bit
  - d. Very much

**Appendix 2. The Following 22 Questions are Part of the MBI Questionnaire**

How often:	0	1	2	3	4	5	6
	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

How Often  
0-6

- 26. \_\_\_\_\_ I feel emotionally drained from my work.
- 27. \_\_\_\_\_ I feel used up at the end of the workday.
- 28. \_\_\_\_\_ I feel fatigued when I get up in the morning and have to face another day on the job.
- 29. \_\_\_\_\_ I can easily understand how my recipients feel about things.
- 30. \_\_\_\_\_ I feel I treat some recipients as if they were impersonal objects.
- 31. \_\_\_\_\_ Working with people all day is really a strain for me.
- 32. \_\_\_\_\_ I deal very effectively with the problems of my recipients.
- 33. \_\_\_\_\_ I feel burned out from my work.
- 34. \_\_\_\_\_ I feel I'm positively influencing other people's lives through my work.
- 35. \_\_\_\_\_ I've become more callous toward people since I took this job.
- 36. \_\_\_\_\_ I worry that this job is hardening me emotionally.
- 37. \_\_\_\_\_ I feel very energetic.
- 38. \_\_\_\_\_ I feel frustrated by my job.
- 39. \_\_\_\_\_ I feel I'm working too hard on my job.
- 40. \_\_\_\_\_ I don't really care what happens to some recipients.
- 41. \_\_\_\_\_ Working with people directly puts too much stress on me.
- 42. \_\_\_\_\_ I can easily create a relaxed atmosphere with my recipients.
- 43. \_\_\_\_\_ I feel exhilarated after working closely with my recipients.
- 44. \_\_\_\_\_ I have accomplished many worthwhile things in this job.
- 45. \_\_\_\_\_ I feel like I'm at the end of my rope.
- 46. \_\_\_\_\_ In my work, I deal with emotional problems very calmly.
- 47. \_\_\_\_\_ I feel recipients blame me for some of their problems.

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