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RESEARCH ARTICLE

GReek Anaesthesiologists's Burnout EPidemic within the COVID-19 pandemic (GRABEP study); a multicenter study on burnout prevalence among Greek anesthesiologists and association with personality traits

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---------- **ABSTRACT** ----------

COVID-19 pandemic resulted in an unprecedented crisis with extreme distress for the frontline physicians and increased risk of developing burnout. Burnout has a negative impact on patients and physicians, posing a substantial risk in patient safety, quality of care and physicians' overall wellbeing. We evaluated burnout prevalence and possible predisposing factors among anaesthesiologists in the COVID-19 referral university/tertiary hospitals in Greece. In this multicenter, cross-sectional study we have included anaesthesiologists, involved in the care of patients with COVID-19, during the fourth peak of the pandemic (11/2021), in the 7 referral hospitals in Greece. The validated Maslach Burnout Inventory (MBI) and Eysenck Personality Questionnaire (EPQ) were used. The response rate was 98% (116/118). More than half of the respondents were females (67.83%, median age 46 years). The overall Cronbach's alpha for MBI and EPQ was 0.894 and 0.877, respectively. The majority (67.24%) of anaesthesiologists were assessed as "high risk for burnout" and 21.55% were diagnosed with burnout syndrome. Almost half participants experienced high levels of all three dimensions of burnout; high emotional exhaustion (46.09%), high depersonalization (49.57%) and high levels of low personal accomplishment (43.49%). Multivariate logistic analysis revealed that neuroticism was an independent factor predicting "high risk for burnout" as well as burnout syndrome, whereas the "Lie scale" of EPQ exhibited a protective effect against burnout. Burnout prevalence in Greek anaesthesiologists working in COVID-19 referral hospitals during the fourth peak of the pandemic was high. Neuroticism was predictive of both "high risk for burnout" and "burnout syndrome".

Trial registration: Observational, cross-sectional study with no interventions so trial not registered.

KEYWORDS: Burnout*Professional, COVID-19, pandemics, patient safety.

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Introduction

The COVID-19 pandemic commenced in China in December 2019 and rapidly spread world widely, resulting to an unprecedented global healthcare crisis.[1-3] The first case in Greece was recorded in February 2020, when Greek anaesthesiologists were already under significant pressure and at increased risk of developing burnout due to critical workforce shortages, leading to pressing clinical, educational and research workload and exhausting work hours in and out of operating rooms.[4,5]

In November 2021, while the COVID-19 referral hospitals in Greece were already struggling with the mounting numbers of COVID-19 cases and deaths, the overwhelming working hours and the demands for a high level of medical acuity, our country experienced the 4th and toughest peak of the pandemic. Hence, the psychological burden of anaesthesiologists and the risk for developing burnout escalated.[2]

According to World Health Organization's International Disease Classification (ICD-10) burnout is categorized as a "syndrome" resulting from "chronic workplace stress that has not been successfully managed". Prolonged and excessive workplace distress may lead to high levels of stress, anxiety and depression, which if not managed successfully will result in a personal expression of feelings of emotional exhaustion, depersonalisation and/or a low sense of personal accomplishment.[1,4,6-8] When threshold levels of emotional exhaustion and/or depersonalisation are being reached this is classified as "high risk for burnout"; "burnout syndrome", also known as "high burnout", is a state characterized by high levels of all three dimensions (emotional exhaustion, depersonalisation and low sense of personal accomplishment).[6,8-10] Of note, burnout may be accompanied by physical symptoms such as back aches, migraines, loss of appetite and disruption of circadian rhythm, while one of the most crucial thought that individuals should deal with is that of helplessness ("there is no way out of this").[7] Hence, burnout should be handled as a clinically meaningful condition since it leads to decreased quality of life for physicians and patients, decreased quality of care, unprofessional behavior, increased medical errors and decreased patient safety.[6]

At present, there is a lack of data on burnout prevalence and possible predictors or contributors among anaesthesiologists in Greece. However, several studies have pinpointed high rates of burnout among anaesthesiologists in United States, Europe, Africa and Asia.[6] During 2020 burnout prevalence was 13.8% among anaesthesiologists in the United States while one year later burnout was significantly higher (60%) among healthcare workers in a COVID-19 intensive care unit in Italy.[6,11] At the same time in our country according to Karlafti et all[12] 71.8% of internists working in public hospitals experienced moderate levels of burnout, while according to Pappa et all[13] healthcare personnel working in regions with high transmission rates and mortality experienced high levels of burnout in all three dimensions, respectively.[12,13]

Burnout pathogenesis seems to be multifactorial, however contributors can be summarized into two main categories: environmental and individual.[4] Most research focuses on environmental factors, also known as stressors, which have been ultimately recognized as the main cause of burnout.[14] However, several individual factors such as female sex, younger

age, marital and parental status and smoking or alcohol consumption have been recognized as significant risk factors for burnout.[4,15] Nevertheless, since 1997, Kam et all[16] have acknowledged a possible relationship between personality traits and burnout in anaesthesiologists, while nine years later Raymond and all[15] found a strong association between personality, work-related stressors and burnout.[15,16] Despite the fact that the aforementioned relationship has not yet been extensively examined, the hypothesis that personality displays a crucial role in the process of developing burnout, especially in the light of the rising awareness about burnout, seems quite reasonable.[14,15] In addition, according to Sanfilippo et all[17] several studies have demonstrated that various occupational stressors may predispose to higher levels of burnout. Among them, lower experience, absence of supervision or job support, excessive work overload, higher career stage and academic or leadership positions have been consistently related with higher levels of burnout. Current literature suggests that younger consultants may be at increased risk for burnout syndrome due to a "surviving effect" when compared to senior consultants or residents. Younger consultants with lower experience are exposed to a higher degree of responsibility and they may also feel stressed or unsecure when facing complex scenarios like management of difficult airway or critically ill patients.[17,18] In addition, as far as the academic practice is concerned, although the results are still scarce, a considerable amount of studies suggest that in our specialty, academic practice should be considered as a predisposing factor for burnout.[4,17] The additional challenge of balancing between clinical care, education, research, administrative and compliance responsibilities may lead to increased workload and higher degree of low job satisfaction, increasing the risk for developing burnout.[17]

The aims of our study were to:

1. Evaluate the burnout levels of anaesthesiologists working in COVID-19 referral, university/tertiary hospitals during the fourth peak of the pandemic in Greece.
2. Identify possible sociodemographic- and personality- related determinants for burnout.
3. Identify the possible role of working-rank or academic practice in developing burnout.

Materials and methods

Reporting is consistent with the STROBE (Strengthening The Reporting of Observational Studies in Epidemiology) statement for observational, cross-sectional studies.[19] The Scientific Board of University General Hospital of Larissa, Greece (Chairperson: Professor Charalampos Skoulakis) waived the need for ethics approval (nr 48811) and the need to obtain consent for the collection, analysis and publication of the prospectively obtained and anonymized data for this voluntary, purely observational and non-interventional study.Permission to conduct the study was also obtained from each hospital director.

Participants and procedures

A cross sectional study was undertaken during the 4th peak of COVID-19 pandemic in Greece. Anaesthesiologists working in COVID-19 referral, university/tertiary hospitals deemed eligible to participate. A self-reported, anonymous study instrument was distributed by pre-specified colleagues in each hospital, after the consent of the heads of the departments. Colleagues who were not involved in the care of COVID-19 patients and those who refused to participate in the study, were excluded. All colleagues were informed that their participation was voluntary, anonymous and that any information provided would be handled with confidentiality.

Measures

The survey questionnaires consisted of 3 parts. The first comprised of 9 questions regarding basic sociodemographic, medical history and work-related information, including sex, age,

marital status, number of children, smoking and alcohol status, any cardiovascular, malignant, or autoimmune comorbidity and the current working rank (resident, locum consultant, junior consultant, senior consultant, director consultant, coordinating director and academic consultant).

The second part consisted of the validated for the Greek population Maslach Burnout Inventory (MBI) after obtaining consent from the authors. MBI is a well-established self-reported measurement consisting of 22 statements, designed to assess the three separate dimensions of burnout that is emotional exhaustion (9 statements), depersonalisation (5 statements) and/or a low sense of personal accomplishment (8 statements).[20,21] Each of the statement is scored based on a seven-point Likert scale ranging from "never" to "everyday". For each of the separate dimensions (subscales) of MBI a score is awarded. The dimensions of emotional exhaustion (EE) and depersonalisation (DP) classify burnout from high to low, while personal accomplishment (PA) classifies the level from low to high.[20,21] The cut-off for high EE was set at 31, while the cut-off for low EE was set at 20, respectively. Accordingly, the cut-off for high DP was set at 11, while the cut-off for low DP was set at 5, respectively. On the other hand, the cut-off for high level of low PA was set at 35, while the cut-off for low level of low PA was set at 42, respectively.[6,8,20,21,22] Based on the majority of previous studies on burnout, we considered a high cut-off score of emotional exhaustion and/or depersonalisation to be applicable for the diagnosis of "high risk for burnout".[6,8,20,21,22] In addition, based on the definition provided by the World Health Organization (WHO) we classified the combination of high cut-off score of emotional exhaustion and depersonalisation and a low cut-off score of personal accomplishment-that is all three dimensions present with the same cut-off thresholds as used in "high risk for burnout"- as burnout syndrome.[6,8,20-22]

For the third part of the study the validated for the Greek population Eysenck Personality Questionnaire (EPQ) was used.[22,23] EPQ explores three main aspects of personality: neuroticism, psychoticism and extraversion. It consists of 84 statements evaluated with a "yes" or "no" answer. Each participant is being assigned a different score for each aspect of personality, as cut-off limits are not applicable.[21-23]

Of note, participants were further categorized based on their working rank into 4 groups and the following was utilized for our analysis: residents, junior consultants (specialists with less than 8 years of clinical experience), senior consultants (specialists with more than 8 years of clinical experience), and academic staff. All coordinating directors are academic staff in our study sample.

Statistical analysis

The Shapiro-Wilk test was performed to test for normal distribution of continuous variables. Results for all quantitative variables are given as median and interquartile range [IQR], whereas all qualitative variables are presented as absolute and/or relative frequencies. The nonparametric Mann-Whitney U or the Kruskal-Wallis test was deployed for comparison of continuous variables with two degrees of freedom or higher, respectively. The Fisher's exact test was used to compare categorical variables. Integral reliability for both questionnaires was investigated by Cronbach's alpha calculation. Spearman's rank correlation coefficients were estimated to investigate associations between continuous variables. Multivariate logistic regression analysis was finally performed to identify predicting factors of "high risk for burnout" and "burnout syndrome".[24] "High risk for burnout" and "burnout syndrome" were converted to binary variables and served as the dependent variables, whereas gender, age, work ranking, marital status, children, medical history (history of cardiac disease, cancer history or autoimmune disease), smoking status, alcohol consumption and all four dimensions of the EPQ questionnaire served as the independent variables in the stepwise forward procedure. All tests were two-tailed and statistical significance was established at 5% ($P <$

0.05). Data were analyzed using Stata ™ (Version 10.1 MP, Stata Corporation, College Station, TX 77845, USA).

Results

A total of 116 anaesthesiologists working in the 7 COVID-19 referral, university/tertiary hospitals participated in the study (response rate 98%). The majority were females (67.83%), and the median age of all participants was 46 years, with an interquartile range of 33 to 52 years. Detailed participant characteristics are shown in Table 1. As expected, age (H=73.268, p<0.001), marital (Pearson's x^2=22.23, p<0.001) and parental status (Pearson's x^2= 35.57, p<0.001) differed between working ranks. Moreover, alcohol consumption was more frequent between residents and junior consultants compared to their elder colleagues (Pearson's x^2= 8.33, p =0.02). Likewise, a borderline statistically significant difference in reported history of autoimmune disease was detected between working ranks, which was higher in academic staff, followed by junior consultants. (Pearson's x^2=7.8, p=0.049).

The majority of Greek anaesthesiologists (67.24%) were classified as "high risk for burnout" based on their answers, while 25 of them had high levels of all three dimensions of burnout, indicating a prevalence of burnout syndrome as high as 21.55% (Fig. 1). As far as "high risk for burnout" and "burnout syndrome" is concerned, no statistical differences were observed according to working rank (Pearson's x^2=0.633, p=0.87 and Pearson's x^2=3.8, p=0.284 for "high risk for burnout" and "burnout syndrome", respectively) or sex (Pearson's x^2=0.219, p=0.673 and Pearson's x^2=0.978, p=0.468 for "high risk for burnout" and "burnout syndrome", respectively). However, both "high risk for burnout" and "burnout syndrome" were more frequently detected in women (69.23% and 76%, respectively) than in men (30.77% and 24%, respectively) and in senior consultants (48.72% and 36%, respectively) compared to the other working ranks. Interestingly, the rate of burnout syndrome among the academic staff was strikingly high; 4 out of 6 academics suffered from burnout syndrome.

Moving on to MBI, the overall Cronbach's alpha was 0.894 and integral reliability was considered good and was found >0.8 across all sections of the questionnaire. Based on the three dimensions of the MBI almost half of Greek anaesthesiologists experienced a high level of burnout in emotional exhaustion (46.09%), depersonalisation (49.57%) and a high level of low personal accomplishment (43.49%), respectively. Moreover, one third of them reported symptoms of average emotional exhaustion (30.43%) and personal accomplishment (31.30%). Descriptive statistics of all dimensions regarding MBI were calculated according to working rank (Table 2) and according to sex (Table 3). Depersonalisation and personal accomplishment scores did not differ between the working ranks (Table 2). However, differences were detected in emotional exhaustion scores (Fisher's x^2=16.22, p=0.008, Table 3), where low levels of emotional exhaustion were reported mostly by residents and high levels of emotional exhaustion were detected in almost all working ranks (Table 2). Burnout scores were similar between males and females (Table 3).

Moving on to EPQ, the overall Cronbach's alpha was 0.877. Table 4 summarizes the different scores of the Eysenck Personality Questionnaire (EPQ) according to working rank and sex. No statistical difference was detected between groups, except for the "Lie scale" where lower values were detected among residents compared to their colleagues (H= 9.34, p=0.025, Table 4). Concerning Spearman's rank correlations, depersonalization was significantly and positively correlated with psychoticism (rho= 0.252, p=0.007) and neuroticism (rho= 0.292, p=0.002), while emotional exhaustion was negatively correlated with extraversion (rho= -0.193, p=0.039), positively correlated with neuroticism (rho=0.44, p<0.001) and positively but marginally correlated with psychoticism (rho=0.173, p=0.06).

Based on the results of the multivariate logistic regression analysis, only neuroticism was identified as a statistically significant independent factor predicting "high risk for burnout"

(OR 1.28 ; *p*=0.001), (Table 5). As far as burnout syndrome is concerned, multivariate logistic regression analysis revealed that neuroticism is a statistically significant independent predictor for burnout syndrome (OR 1.20 ; *p*=0.001), whereas the "Lie scale" exhibited a protective effect against burnout syndrome (OR 0.79 ; *p*=0.027). Interestingly, academic staff exhibited more than a 5-fold risk for burnout syndrome compared to residents, but this was borderline statistically significant (OR 5.46; *p*=0.078), (Table 5).

Discussion

Our study revealed that the majority (67.24%) of anaesthesiologists working in COVID-19 referral, university/tertiary hospitals during the toughest peak of the pandemic in Greece were identified as "high risk for burnout", while 21.55% of them suffered from burnout syndrome. In analyzing the three dimensions of burnout, almost half of our colleagues experienced a high level of emotional exhaustion (46.09%), depersonalisation (49.57%) and a high level of low personal accomplishment (43.49%), while one third of them responded with symptoms of average emotional exhaustion (30.43%) and personal accomplishment (31.30%). Burnout syndrome was more frequently detected in women (76%) compared to men and in senior consultants (36%) compared to other working ranks. Multivariate logistic analysis revealed neuroticism as an independent prognostic factor for both "high risk for burnout" and burnout syndrome, and "Lie scale" exhibited a protective effect against burnout syndrome.

According to the existing literature these results are within the highest burnout rates. Before the COVID-19 pandemic, burnout prevalence among anesthesiologists has been reported within a range of 14-65% in peer-reviewed publications.[4,6] In the largest study of physicians across all specialties, which took place in 2012 in the United States, the mean burnout rate was 45.4% and substantial differences in burnout rates were observed by specialty.[4,6] Physicians working in high-stress and frontline environments, including anaesthesiology, were at increased risk of developing burnout, compared to those working in less acute care specialties, such as dermatology.[4,6] In the most recent and largest published study to date in anaesthesiology, that took place early in the pandemic (March 2020) in the United States, Afonso et all[6] found that the prevalence of burnout syndrome was 13.8%, while 59.2% of participants had a "high risk for burnout".[6]

Therefore, it seems that even before or early in the course of the pandemic, burnout had reached a critical figure within our specialty, as 1 in 2 anaesthesiologists were at high risk for developing burnout and at least 1 in 10 anaesthesiologists were already suffering from burnout syndrome. Accordingly, experts suggest that "this clinical meaningful situation is rooted in the environment and care delivery system, rather than in the personal characteristics of a few susceptible individuals".[4,25] When the COVID-19 pandemic reached its first peak it further stressed the already burdened workforce in our specialty, as anaesthesiologists all around the world were called to play an essential leading role in COVID-19 referral centres due to their exceptional technical and non-technical skills, such as airway and crisis management, and their expertise in critical ill patients management and resuscitation.[4] The highly contagious nature of COVID-19 combined with the initial lack of knowledge concerning virus transmission and pathophysiology of infection, shortage of personal protective equipment and fears of exposure and transmission to others created a great psychological burden on anaesthesiologists during the COVID-19 pandemic. Furthermore, loss of autonomy, decreased control over environment, increased workload and lack of work-life balance were also recognised as strong predisposing factors for mental health issues.[4,6] Hence, a further increase of burnout risk among anaesthesiologists was anticipated. According to our study results (November 2021) the rate of burnout syndrome almost doubled within a 20-month period (21.55% versus 13.8%), when compared with the results of the aforementioned study by Afonso et al (March 2020).[6]

It should be highlighted that, the rates of the three dimensions of burnout (emotional exhaustion, depersonalisation, low personal accomplishment) were also escalated during the pandemic. In our study almost half of our colleagues experienced a high level of emotional exhaustion (46.09%) and depersonalisation (49.57%) and a high level of low personal accomplishment (43.49%). In the study by Afonso[6] et al during the early phase of the pandemic (March 2020) the rates of depersonalisation (37.2%) and low personal accomplishment (25.9%) were lower, while the rate of emotional exhaustion (53.3%) was similar to ours.[6] "A perceived lack of support at work" was found to be the strongest risk factor for developing burnout in the United States, followed by "perceived lack of support at home", "working greater than or equal to 40 hours per week", and "not having a confidant at work". Emotional exhaustion is defined as "feeling like one cannot meet the demands of their patients, co-workers or loved ones, due to complete lack of energy to engage". Based on the definition of emotional exhaustion and the recognized risk factors for developing burnout in the study by Afonso, the high levels of emotional exhaustion may look quite reasonable.[4,6]

In the study of Podhorodecka et all[26] 158 anaesthesiologists from Poland were assessed for burnout during 2022.[26] Burnout prevalence was slightly higher than in our study sample (73% vs 67.24%). Almost all participants (97.3%) reported that the pandemic had had a negative influence on their level of burnout.[26] At the same time in Greece 71.8% of internists, working in "AHEPA" University Hospital, were diagnosed with moderate levels of burnout, while the majority of them (88%) suffered from exhaustion.[12] In another study that was conducted during 2020 in "Evangelismos" and "Attikon" General Hospitals in Athens, only 30% of participants, including physicians, nurses and technicians, from Intensive Care Units, Emergency Departments and High Dependency Units, were diagnosed with burnout. However, one-third of them had already developed post-traumatic stress disorder, depending on their degree of emotional exhaustion.[27] Of note, during the pandemic, apart from burnout, healthcare personnel also suffered from increased psychological stress. In the study by Samara et all[28], which was conducted during 2021 and included 1484 participants from Greece, more than 10% reported at least moderate symptoms of depression, anxiety or stress.[28] Women, younger participants, residents in urban areas and first responders were at increased risk for higher anxiety scores. Moreover, Kalaitzaki and Rovithis[29] studied the positive and negative impact in the mental health of 673 healthcare workers from all nine geographical regions of Greece. According to authors almost 8/10 participants experienced at least moderate levels of negative impact, known as vicarious traumatization or secondary traumatic stress. On the other hand, the levels of positive impact, known as vicarious post-traumatic growth, were relatively low but with a high degree of resilience. The authors concluded that effective screening of population at high risk for secondary traumatic stress, along with the prevention and intervention programs in an attempt to enhance resilience and to promote successful coping strategies, should be implemented in an effort to safeguard the population and promote the posttraumatic growth.[29]

As far as the female sex is concerned, it should be highlighted that, although sex differences regarding burnout have been described in the literature and female sex is considered an individual risk factor for developing burnout, this should be evaluated with scrutiny. Contrary to a commonly described misconception, women per se do not experience higher levels of burnout, however women, when compared to men, may display the three dimensions of burnout in a distinct way. Women are more likely to suffer from emotional exhaustion, whereas men from depersonalisation.[4,26]

In our study, though senior consultants exhibited higher rates of burnout syndrome compared to other working ranks, burnout syndrome percentages among the Academic staff were strikingly high; 4 out of 6 Academics suffered from burnout Syndrome. The role of academic background in emotional exhaustion and depersonalisation among anaesthesiologists has long been recognized.[4,14,24] Academic staff have to balance clinical,

educational, research, administrative and compliance responsibilities.[4,26] Based on a survey performed by Fidelity and the Chronicle of Higher Education in 2020, burnout has risen dramatically in academic staff during the pandemic (70%, vs 32% in 2019); academic staff was suffering from severe stress, while more than 2/3 of responders reported a deterioration of work-life imbalance, especially females as in our study.[20,24] In our study academic staff exhibited a borderline statistically significant 5-fold risk for burnout syndrome compared to residents. On the other hand, our results disagree with current literature, as senior consultants experienced higher levels of burnouts when compared with younger consultants.[24] A possible explanation could be that in the rise of the pandemic senior anaesthesiologists established a protective behaviour towards their younger colleagues, risking their own well-being, acknowledging the extremely stressful, vulnerable and complex clinical situations in which younger consultants, with lower experience had to be exposed, when treating patients suffering from COVID-19.[18,24]

With respect to personality traits neuroticism has been strongly associated with burnout since 1998 and in the study by Raymond et al it was found to be the most important personality trait influencing psychological distress and burnout in anaesthesiologists.[21,31] Although, some of the characteristics of neuroticism such as social anxiety and empathy may be desirable traits for anaesthesiologists, fearfulness and low self-esteem could also be considered as risk factors in terms of poor inhibition of impulses, helplessness and irritability.[21,31] Regarding the protective effect of "Lie scale" there is a paucity of data in current literature. However, a possible explanation might be that persons with a high tendency to distort meanings of the scores in personality tests, may also be able to distort reality as a coping mechanism or protective when put under stress.[4,21]

Our study should be perceived under certain limitations. First, one important limitation is lack of data on pre-pandemic burnout levels. However, the role of the pandemic in the exaggeration of the in- and out-of-hospital challenges, on the top of long-lasting critical workforce shortages, and in the escalation of the risk for burnout should not be overlooked. Secondly, although validated questionnaires for the Greek population were used, those were self-reported instruments. Hence, a more thorough psychological assessment seems mandatory, along with the implementation of preventive and treatment strategies for burnout. Moreover, as our survey took place during the toughest peak of the pandemic, when anaesthesiologists were lacking personal time, we ought to keep our survey short in order to have a high response rate. Thus, in terms of time management, we did not include any questions about working hours, mandatory days off after night calls, hospital support for childcare, department support for overall well-being or any "open questions" that could give us additional information. These should be further addressed in a future survey regarding burnout, as follow-up studies are needed so as to monitor the course of mental health of our colleagues and raise awareness about burnout. However, to the best of our knowledge, this is the first study attempt to investigate the burnout among anaesthesiologists during the pandemic in Greece, and thus it should be considered as one of the first steps in the deployment of a strategy for supportive leadership, control of work schedules and promotion of balance between personal and professional life to mitigate burnout in anaesthesiology.

To conclude, our study confirms that Greek anaesthesiologists' burnout levels in COVID-19 referral hospitals during the fourth peak of the pandemic were within the highest reported levels. Neuroticism traits were identified as significant predictive factors for both "high risk for burnout" and "burnout syndrome". In the rise of the post-pandemic era, treatment and preventive strategies for burnout, along with the formation of a well-being culture seem mandatory in order to mitigate burnout in our specialty.

References

1. Torrente M, Sousa PA, Sánchez-Ramos A, Pimentao J, Royuela FF, Collazo-Lorduy A, et al. To burn-out or not to burn-out: a cross-sectional study in healthcare professionals in Spain during COVID-19 pandemic. *BMJ Open* 2021, 11:e044945, doi: 10.1136/bmjopen-2020-044945
2. WHO Coronovirus (COVID-19) Dashboard. (Cited 10 September 2022). Available from https://covid19.who.int
3. Firew T, Sano ED, Lee JW, Flores S, Lang K, Salman K, et al. Protecting the front line: a cross-sectional survey analysis of the occupational factors contributing to healthcare workers' infection and psychological distress during the COVID-19 pandemic in the USA. *BMJ Open* 2020, 10:e042752, doi: 10.1136/bmjopen-2020-042752
4. Aron R, Pawlowski J, Shukry M, Shillcutt S. The Impact of COVID-19 on the Status of the Anesthesiologists' Well-Being. *Adv Anesth* 2021, 39:149-167, doi: 10.1016/j.aan.2021.07.009
5. Zador L, Nowak K, Sitarik A, MacLean L, Han X, Kalsi M, et al. The Burnout Epidemic Within A Viral Pandemic: Impact of a Wellness Initiative. *Perioper Care Oper Room Manag* 2022, 27:100251
6. Afonso AM, Cadwell JB, Staffa SJ, Zurakowski D, Vinson AE. Burnout Rate and Risk Factors among Anesthesiologists in the United States. *Anesthesiology* 2021, 134:683-696, doi: 10.1016/j.pcorm.2022.100251
7. Queen D, Harding K. Societal pandemic burnout: A COVID legacy. *Int Wound J* 2020, 17:873-874, doi: 10.1111/iwj.13441
8. Burn-out an "occupational phenomenon": International Classification of Diseases. (Cited 10 September 2022). Available from https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases
9. Maslach C, Jackson S, Leiter M. Maslach Burnout Inventory: 3rd edition. In: Zalaquett CP & Woods RJ (ed) *Evaluating Stress: A book of resources*. Consulting Psychologists Press, Palo Alto, USA, 1996
10. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol* 2001, 52:397-422, doi: 10.1146/annurev.psych.52.1.397
11. Stocchetti N, Segre G, Zanier ER, Zanetti M, Campi R, Scarpellini F, et all. Burnout in Intensive Care Unit Workers during the Second Wave of the COVID-19 Pandemic: A Single Center Cross-Sectional Italian Study. *Int J Environ Res Public Health* 2021, 18:6102, doi: 10.3390/ijerph18116102
12. Karlafti E, Benioudakis ES, Barouxi E, Kaiafa G, Didangelos T, Fountoulakis KN, et all. Exhaustion and burnout in the healthcare system in Greece: A cross-sectional study among internists during the COVID-19 lockdown. *Psychiatriki* 2022, 33:21-30, doi: 10.22365/jpsych.2022.067
13. Pappa S, Athanasiou N, Sakkas N, Patrinos S, Sakka E, Barmparessou Z, et all. From Recession to Depression? Prevalence and Correlates of Depression, Anxiety, Traumatic Stress and Burnout in Healthcare Workers during the COVID-19 Pandemic in Greece: A Multi-Center, Cross-Sectional Study. *Int J Environ Res Public Health* 2021, 18:2390, doi: 10.3390/ijerph18052390
14. van der Wal RAB, Wallage J, Bucx MJL. Occupational stress, burnout and personality in anesthesiologists. *Curr Opin Anaesthesiol* 2018, 31:351-356, doi: 10.1097/ACO.0000000000000587
15. van der Wal RA, Bucx MJ, Hendriks JC, Scheffer GJ, Prins JB. Psychological distress, burnout and personality traits in Dutch anaesthesiologists: A survey. *Eur J Anaesthesiol* 2016, 33:179-86, doi: 10.1097/EJA.0000000000000375

16. Kam PC. Occupational stress in anaesthesia. *Anaesth Intensive Care* 1997, 25;686-90, doi: 10.1177/0310057X9702500617
17. Sanfilippo F, Noto A, Foresta G, Santonocito C, Palumbo GJ, Arcadipane A, et all. Incidence and Factors Associated with Burnout in Anesthesiology: A Systematic Review. *Biomed Res Int* 2017, 2017:8648925, doi: 10.1155/2017/8648925
18. Brown PA, Slater M, Lofters A. Personality and burnout among primary care physicians: an international study. *Psychol Res Behav Manag* 2019, 12:169-177, doi: 10.2147/PRBM.S195633
19. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP; STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol* 2008, 61:344-349, doi: 10.1016/j.jclinepi.2007.11.008
20. Anagnostopoulos F, Papadatou D. Productive synthesis and internal cohesion of questionnaire of recording burnout in sample of nurses. Psychological Subjects. 1992; 5:183-202. [Google Scholar]
21. Ntantana A, Matamis D, Savvidou S, Giannakou M, Gouva M, Nakos G, Koulouras V. Burnout and job satisfaction of intensive care personnel and the relationship with personality and religious traits: An observational, multicenter, cross-sectional study. *Intensive Crit Care Nurs* 2017, 41:11-17, doi: 10.1016/j.iccn.2017.02.009
22. Milenović M, Matejić B, Vasić V, Frost E, Petrović N, Simić D. High rate of burnout among anaesthesiologists in Belgrade teaching hospitals: Results of a cross-sectional survey. *Eur J Anaesthesiol* 2016, 33:187-94, doi: 10.1097/EJA.0000000000000383
23. Dimitriou E. EPQ Personality questionnaire: Greek validation in the Greek population. Engefalos. 1986; 23:41–54
24. Dyrbye LN, West CP, Shanafelt TD. Defining burnout as a dichotomous variable. *J Gen Intern Med* 2009, 24:440; author reply 441, doi: 10.1007/s11606-008-0876-6
25. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med* 2012, 172:1377-85, doi: 10.1001/archinternmed.2012.3199
26. Podhorodecka K, Radkowski P, Boniecka P, Wojtkiewicz J. Psychological Distress after the COVID-19 Pandemic among Anesthesiologists in Poland-An Observational Study. *Int J Environ Res Public Health* 2022, 19:9328, doi: 10.3390/ijerph19159328
27. Ilias I, Mantziou V, Vamvakas E, Kampisiouli E, Theodorakopoulou M, Vrettou C, et all. Post-Traumatic Stress Disorder and Burnout in Healthcare Professionals During the SARS-CoV-2 Pandemic: a Cross-Sectional Study. *J Crit Care Med (Targu Mures)* 2021, 7:14-20, doi: 10.2478/jccm-2020-0042
28. Samara MT, Peppou LE, Giannouchos TV, Nimatoudis I, Papageorgiou C, Economou M, Souliotis K. COVID-19 psychological impact, knowledge and perceptions of healthcare professionals in Greece: A nationwide cross-sectional study. *Psychiatriki* 2021, 32:271-281, doi: 10.22365/jpsych.2021.044
29. Kalaitzaki A, Rovithis M. Secondary traumatic stress and vicarious posttraumatic growth in healthcare workers during the first COVID-19 lockdown in Greece: The role of resilience and coping strategies. *Psychiatriki* 2021,32:19-25, doi: 10.22365/jpsych.2021.001
30. "On the verge of burnout" COVID-19's impact on faculty well-being and career plans. . (Cited 10 September 2022). Available from https://connect.chronicle.com/rs/931-EKA-218/images/Covid%26FacultyCareerPaths_Fidelity_ResearchBrief_v3%20%281%29.pdf
31. van der Wal RAB, Wallage J, Bucx MJL. Occupational stress, burnout and personality in anesthesiologists. *Curr Opin Anaesthesiol* 2018, 31:351-356, doi: 10.1097/ACO.0000000000000587

Table 1. Participant characteristics

Demographics	
Sex (male/female)	37 (32.17%) / 78 (67.83%)
Age (years)	46 [33 – 52]
Marital status	
Single	49 (42.98%)
Married/Cohabitation	56 (49.12%)
Divorced	9 (7.89%)
Widowed	-
Children (yes/no)	64 (56.64%) / 49 (43.36%)
Number of children	2 [1 – 2]
Medical history	
Smoking (yes/no)	40 (34.78%) / 75 (65.22%)
Alcohol	
None/rarely	61 (53.51%)
Once or twice weekly	39 (34.21%)
Three to four times weekly	13 (11.4%)
More than four times weekly	1 (0.88%)
History of cardiac disease or cancer (yes/no)	7 (6.25%) / 105 (93.75%)
History of autoimmune disease (yes/no)	19 (16.52%) / 96 (83.48%)
Job characteristics	
Rank	
Resident	28 (24.35%)
Locum consultant	4 (3.48%)
Junior consultant	18 (15.65%)
Senior consultant	16 (13.91%)
Director consultant	39 (33.91%)

Coordinating Director	5 (4.35%)
Academic consultant	5 (4.35%)

Results are presented as median [IQR] and as absolute and relative frequencies accordingly

Table 2. Participant Burnout scores extracted from Maslach Burnout Inventory by working rank

	Total (*n*=115)	Resident (*n*=28)	Junior Consultant (*n*=23)	Senior consultant (*n*=54)	Academic staff (*n*=10)	*Statistic, p value*
Depersonalization score	10 [5 – 14]	10 [4 – 17]	11 [6 – 17]	10 [5 – 13]	11 [5 – 14]	H=1.352 p=0.717
Depersonalization subgroups						
Low	31 (26.96%)	8 (28.57%)	4 (17.39%)	15 (27.78%)	4 (40%)	Pearson's x^2= 4.638, p=0.551
Average	27 (23.48%)	7 (25%)	7 (30.43%)	13 (24.07%)	0	
High	57 (49.57%)	13 (46.43%)	12 (52.17%)	26 (48.15%)	6 (60%)	
Personal accomplishment score	37 [31.5 – 42]	35.5 [30.5 – 42]	37 [29 – 40]	37 [33 – 43]	36 [32 – 43]	H=1.417, p=0.701
Personal accomplishment subgroups						
Low	29 (25.22%)	7 (25%)	3 (13.04%)	16 (29.63%)	3 (30%)	Pearson's x^2=4.346, p=0.638
Average	36 (31.3%)	7 (25%)	10 (43.48%)	17 (31.48%)	2 (20%)	
High	50 (43.48%)	14 (50%)	10 (43.48%)	21 (38.89%)	5 (50%)	

Emotional exhaustion score	29 [21 – 36.5]	30 [13.5 – 35]	31 [23 – 37]	28 [22 – 38]	30.5 [20 – 45]	H=2.409, p=0.492
Emotional exhaustion subgroups						
Low	27 (23.48%)	12 (42.86%)	4 (17.39%)	8 (14.81%)	3 (30%)	Pearson's x^2=16.226, p=0.008
Average	35 (30.43%)	2 (7.14%)	7 (30.43%)	24 (44.44%)	2 (20%)	
High	53 (46.09%)	14 (50%)	12 (52.17%)	22 (40.74%)	5 (50%)	

Results are presented as median [IQR] and as absolute and relative frequencies, accordingly

Table 3. Participant Burnout scores extracted from Maslach Burnout Inventory by sex

	Total (*n*=115)	Males (*n*=37)	Females (*n*=78)	*Statistic, p value*
Depersonalization score	10 [5 – 14]	11 [6 – 14]	10 [5 – 13]	H=0.285, p=0.593
Depersonalization subgroups				
Low	31 (26.96%)	9 (24.32%)	22 (28.21%)	Pearson's x^2=0.192, p=0.932
Average	27 (23.48%)	9 (24.32%)	18 (23.08%)	
High	57 (49.57%)	19 (51.35%)	38 (48.72%)	
Personal accomplishment score	37 [31.5 – 42]	36 [33 – 42]	37 (31 – 41]	H= 0.496, p=0.481
Personal accomplishment subgroups				
Low	29 (25.22%)	11 (29.73%)	18 (23.08%)	

Average	36 (31.3%)	10 (27.03%)	26 (33.33%)	Pearson's x^2=0.76, p=0.668
High	50 (43.48%)	16 (43.24%)	34 (43.59%)	
Emotional exhaustion score	29 [21 – 36.5)	28 [20 – 38]	29.5 [21 – 35]	H=0.063, p=0.801
Emotional exhaustion subgroups				
Low	27 (23.48%)	11 (29.73%)	16 (20.51%)	Pearson's x^2=1.212, p=0.576
Average	35 (30.43%)	10 (27.03%)	25 (32.05%)	
High	53 (46.09%)	16 (43.24%)	37 (47.44%)	

Results are presented as median [IQR] and as absolute and relative frequencies, accordingly

Table 4. Eysenck Personality Questionnaire personality scores by working rank and by sex

	Extraversion	Psychoticism	Neuroticism	Lie
Cronbach's alpha	0.848	0.807	0.801	0.651
Total	12 [8 – 16]	4 [3 – 8]	11 [9 – 14]	12 [9 – 13]
Working rank				
Resident	14 [8.5 – 16]	4.5 [3 – 8.5]	11 [6.5 – 13]	10 [8 -12]
Junior consultant	10 [7 – 14]	5 [3 - 11]	11 [10 – 14]	12 [9 – 14]
Senior consultant	11.5 [8 – 16]	4 [3 – 7]	11 [9 – 14]	12 [9 – 14]
Academic staff	12.5 [8 – 17]	4 [3 – 5]	11 [7 – 15]	13 [11 – 14]
H, P value	3.45, 0.327	1.49, 0.685	1.353, 0.716	9.34, 0.025
Sex				
Males	13 [9 – 16]	4 [3 – 6]	10 [8 – 14]	12 [8 – 13]

Females	12 [7 – 16]	5 [3 – 8.5]	11.5 [10 – 14]	12 [9 – 13]
z, P value	-1.022, 0.307	0.662, 0.507	1.481, 0.138	0.025, 0.979

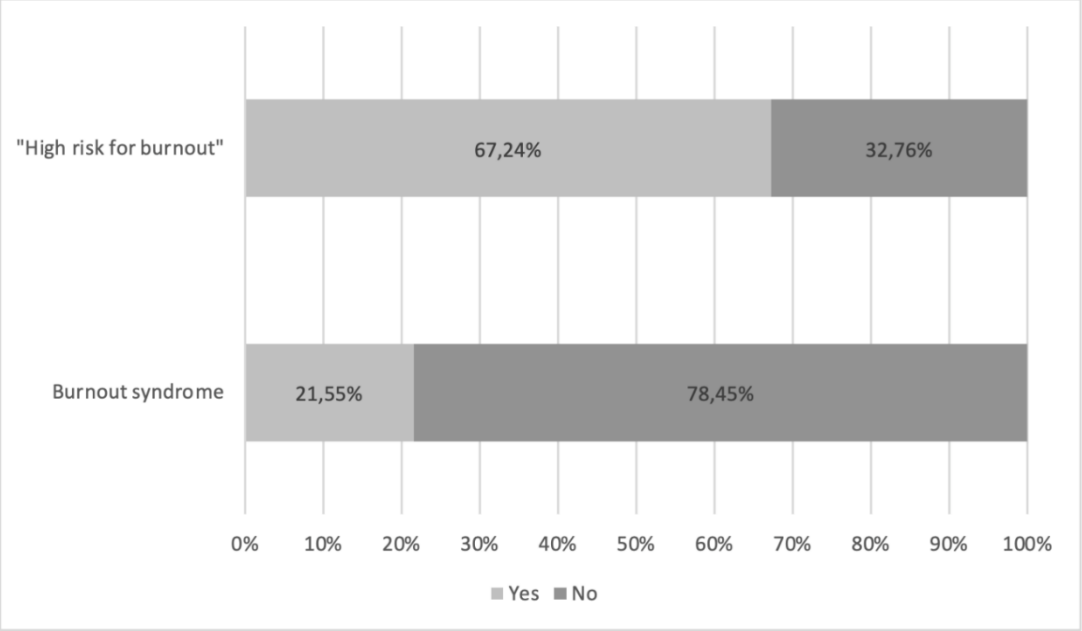
Results are presented as median [IQR].
The Kruskal-Wallis and the Mann-Whitney U test were employed as appropriate

Table 5. Multivariate logistic regression model of factors predicting "high risk for burnout" and "burnout syndrome"

High risk for burnout	Odds Ratio	Standard Error	z	P>|z|	95% Conf. Interval
EPQ_L	1.28	0.084	3.82	<0.001	1.13 to 1.46
EPQ_N	0.84	0.076	-1.87	0.061	0.71 to 1
Burnout syndrome					
EPQ_L	0.79	0.085	-2.21	0.027	0.64 to 0.97
EPQ_N	1.2	0.086	2.58	0.01	1.04 to 1.38
EPQ_P	1.12	0.078	1.69	0.092	0.98 to 1.29
Junior consultants vs residents	0.57	0.457	-0.69	0.488	0.12 to 2.724
Senior consultants vs residents	0.76	0.519	-0.4	0.689	0.2 to 2.89
Academic staff vs residents	5.46	5.256	1.76	0.078	0.83 to 36.03

EPQ: Eysenck Personality Questionnaire, L: Lie, N: Neuroticism, P: Psychoticism

Fig. 1 Frequency percentage of "high risk for burnout" and burnout syndrome



PSYCHIATRIKI

ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

Η επιδημία της επαγγελματικής εξουθένωσης των Ελλήνων αναισθησιολόγων στη διάρκεια της πανδημίας COVID-19 (GRABEP μελέτη): μία πολυκεντρική μελέτη του επιπολασμού της επαγγελματικής εξουθένωσης στους Έλληνες αναισθησιολόγους και συσχέτισης με χαρακτηριστικά της προσωπικότητας

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---------- **ΠΕΡΙΛΗΨΗ** ----------

Η πανδημία COVID-19 οδήγησε σε μία άνευ προηγουμένου κρίση με αυξημένο κίνδυνο για εμφάνιση συνδρόμου επαγγελματικής εξουθένωσης στους επαγγελματίες υγείας που εργάστηκαν στην πρώτη γραμμή. Το σύνδρομο επαγγελματικής εξουθένωσης επιδρά αρνητικά στους ασθενείς και στους ιατρούς, θέτοντας σε ιδιαίτερο κίνδυνο την ασφάλεια των ασθενών, την ποιότητα παροχής υπηρεσιών υγείας και τη γενική ευημερία των ιατρών. Στην παρούσα μελέτη αξιολογήθηκαν τα επίπεδα του συνδρόμου επαγγελματικής εξουθένωσης και οι πιθανοί προδιαθεσικοί παράγοντες των αναισθησιολόγων των Πανεπιστημιακών/Τριτοβάθμιων νοσοκομείων αναφοράς για τον COVID-19 στην Ελλάδα. Πρόκειται για μία πολυκεντρική, συγχρονική μελέτη στην οποία συμπεριλήφθηκαν όλοι οι αναισθησιολόγοι που συμμετείχαν στη φροντίδα των ασθενών με λοίμωξη COVID-19, στη διάρκεια του 4ου κύματος της πανδημίας (11/2021) στα 7 πανεπιστημιακά νοσοκομεία αναφοράς στην Ελλάδα. Χρησιμοποιήθηκαν τα σταθμισμένα για τον ελληνικό πληθυσμό ερωτηματολόγια Maslach Burnout Inventory (MBI) και Eysenck Personality Questionnaire (EPQ). Το ποσοστό απόκρισης ήταν 98% (116/118). Περισσότεροι από τους μισούς

συμμετέχοντες ανήκαν στο θήλυ φύλο (67.83%, μέση ηλικία 46 έτη). Ο συντελεστής Cronbach's alpha για το MBI και το EPQ υπολογίστηκε στο 0.894 and 0.877, αντίστοιχα. Η πλειοψηφία (67.24%) των αναισθησιολόγων κατηγοριοποιήθηκαν ως «υψηλού κινδύνου για σύνδρομο επαγγελματικής εξουθένωσης», ενώ 21.55% διαγνώστηκαν με σύνδρομο επαγγελματικής εξουθένωσης. Σχεδόν οι μισοί συμμετέχοντες εμφάνιζαν υψηλά επίπεδα επαγγελματικής εξουθένωσης με βάση και τις τρεις διαστάσεις του συνδρόμου, με υψηλή συναισθηματική εξάντληση (46.09%), υψηλή αποπροσωποποίηση (49.57%) και υψηλά επίπεδα έλλειψης προσωπικών επιτευγμάτων (43.49%). Η πολυπαραγοντική ανάλυση ανέδειξε ότι ο νευρωτισμός ήταν ανεξάρτητος προγνωστικός παράγοντας για «υψηλό κίνδυνο επαγγελματικής εξουθένωσης» και για σύνδρομο επαγγελματικής εξουθένωσης, ενώ η «κλίμακα ψεύδους» του EPQ παρουσιάζει προστατευτικό ρόλο έναντι του συνδρόμου επαγγελματικής εξουθένωσης. Τα επίπεδα της επαγγελματικής εξουθένωσης των Ελλήνων αναισθησιολόγων που εργάστηκαν στα νοσοκομεία αναφοράς του COVID-19 στη διάρκεια του 4^{ου} κύματος της πανδημίας ήταν υψηλά. Ο νευρωτισμός αποδείχθηκε προγνωστικός παράγοντας τόσο για «υψηλό κίνδυνο επαγγελματικής εξουθένωσης», όσο και για εμφάνιση συνδρόμου επαγγελματικής εξουθένωσης.

ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ: Σύνδρομο επαγγελματικής εξουθένωσης, COVID-19, πανδημία, ασφάλεια ασθενών.

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