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ORIGINAL ARTICLE

Evaluation of physician burnout at a major trauma centre using the Copenhagen burnout inventory: cross-sectional observational study

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Abstract

Background Healthcare workers are susceptible to burnout owing to the demanding nature of their profession. The sequela of this is an increased incidence of medical errors and decreased job satisfaction.

Aims This study aimed to assess the degree of burnout among physicians of different grades and specialties in a major trauma centre.

Methods This study was performed in a UK tertiary trauma centre (Brighton and Sussex University Hospitals) in which 165 doctors from four medical specialties working with acute admissions were given the Copenhagen burnout inventory questionnaire via email and responses were received anonymously. Mean scores were calculated, and a two-tailed *P* test was performed to assess for statistically significant difference between patient- and work-related factors.

Results The response rate was 77.57% ($n = 165$). General surgeons had the highest total burnout mean score of 50.00 with an SD of 12.78 followed by emergency medicine, acute medicine and finally orthopaedics. Junior doctors had an overall score of 53.42 with a standard deviation of 5.21, followed by consultants and registrars. The total burnout scores showed that 7.0% ($n = 9$) had low burnout scores while 56.3% ($n = 72$) had moderate burnout and 36.7% ($n = 47$) had high burnout scores. A two-tailed *P* test revealed a statistically significant difference between the work-related and patient-related subscales ($P < 0.0001$).

Conclusions Ninety-three percent of responders demonstrated either moderate or high levels of burnout in this study. Work-related factors appeared to contribute more to occurrence of burnout rather than the patient-related or doctor-patient interactions.

Keywords Burnout · Copenhagen burnout inventory · Maslach burnout inventory · Physician

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Introduction

Healthcare workers are among those exposed to high levels of stress at work due to the demanding virtue of their profession and hence are more susceptible to burnout syndrome [1–3]. The causes of the high prevalence of burnout syndrome in healthcare workers could be attributed to the doctor-patient interactions and to career stressors. The day to day interaction with patients could place immense challenges of dealing with lifesaving situations, frustrations and uncertainty in clinical decisions, exposing healthcare providers to a myriad of stressful emotions. On the other hand, patient-unrelated stressors include bureaucratic requirements in their career as well as the rapidly advancing medical knowledge with the constant need to keep in touch with it [4, 5]. These changes are often so rapid that by the time doctors have acclimatized with one change, something else may come up or evolve.

The sequela of burnout syndrome is an increase in the incidence of medical errors, mental disorders and substance abuse as well as decreased job satisfaction [6–8]. According to the classic burnout definition, burnout matures in the daily life of practicing physicians as a result of continuous exposure to stress leading to emotional exhaustion, depersonalization and sense of low personal accomplishment. This leads to individual's withdrawal from responsibilities and detachment from the job, which incites early retirement [9, 10].

The aim of this study was to assess whether the degree of burnout reported in the medical literature was present in physicians working in specialties in a major trauma centre in England that dealt with either the acute medical or surgical admissions. We wished to see if there were any significant differences between the specialties and the career grades of doctor in this study and to assess which factors are the most detrimental for burnout occurrence.

Methods

The concept of burnout was introduced in the psychosocial literature by Maslach in 1976 and since then, the large majority of empirical studies on burnout in the international literature have employed the use of Maslach burnout inventory (MBI). According to the classic definition of Maslach and Jackson, "burnout is a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do 'people work' of some kind" [9].

The more recent Copenhagen burnout inventory (CBI) consists of three scales measuring personal burnout, work-related burnout and patient-related burnout through a 19-item survey. In a sample of 1914 individuals from seven different workplaces, CBI scales had high internal reliability, scores correlated with SF-36 scales and scores predicted future sickness absence, intention to quit and sleep problems [11].

In the CBI, the core of burnout is fatigue and exhaustion. This is in accordance with a more recent definition of burnout as a state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding [12].

There are multiple questions for each of these subscales and responses are in the form of either always, often, sometimes, seldom and never/almost never or to a very high degree, to a high degree, somewhat, to a low degree and to a very low degree and are coded into scores of 100, 75, 50, 25 and 0 respectively.

Personal burnout subscale is intended to answer the simple question: How tired or exhausted is the person being surveyed? Thus, basically, personal burnout is the degree of physical and psychological fatigue and exhaustion experienced by the person.

On the other hand, work-related subscale is defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work. By comparing the scale for personal burnout with the scale for work-related burnout, it will be possible to identify persons who are tired but who attribute the fatigue to non-work factors such as e.g. health problems or family demands.

Finally, the patient-related subscale is defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work with patients.

Items within the subscale are averaged, with possible score ranges for all scales is 0–100 and higher scores indicating a higher degree of burnout. In our study, for the sake of statistical analysis, we have chosen scores of 25 or lower, 25 to 50 and higher than 50 to categorize low, intermediate and high burnout.

One hundred sixty-five staff doctors from four different medical specialties (emergency medicine, trauma and orthopaedics, general surgery and acute medicine) and from varying grades (ranging from junior doctors to consultants) affiliated to our institute (Brighton and Sussex University Hospitals, UK) were given the Copenhagen questionnaire via mail and responses were received via an encrypted link to ensure anonymity of responses. The completed questionnaires were anonymously received and the mean scores and standard deviations for each subscale were calculated for different specialties and for different grades of doctors participating in the study.

Results

The response rate was 77.57% ($n = 165$), 51 participants from the emergency medicine specialty (39.8%), 36 from the acute medicine (28.1%), 27 from trauma and orthopaedics (21.1%) and 14 from general surgery (11%) all responded to the Copenhagen questionnaire. Among the participants, there were 25 consultants (19.5%), 46 registrars (40%) and 71 junior doctors (55.5%) (Fig. 1). The mean scores and standard deviations (SD) for each subscale were calculated.

Looking at each specialty separately, the general surgery doctors had the highest total burnout mean score of 50.00 (lowest was 26.31 and highest was 69.73) with an SD of 12.78 followed by emergency medicine with a mean of 46.47 (lowest score was 17.10 and highest was 69.73) and SD of 11.65, acute medicine with a mean of 46.13 (lowest score was 21.05 and highest was 69.73) and SD of 12.65 and finally orthopaedics with a mean of 40.20 (lowest score was 18.42 and highest was 75) and SD = 13.57. This shows that all the 128 responders from the four medical specialties

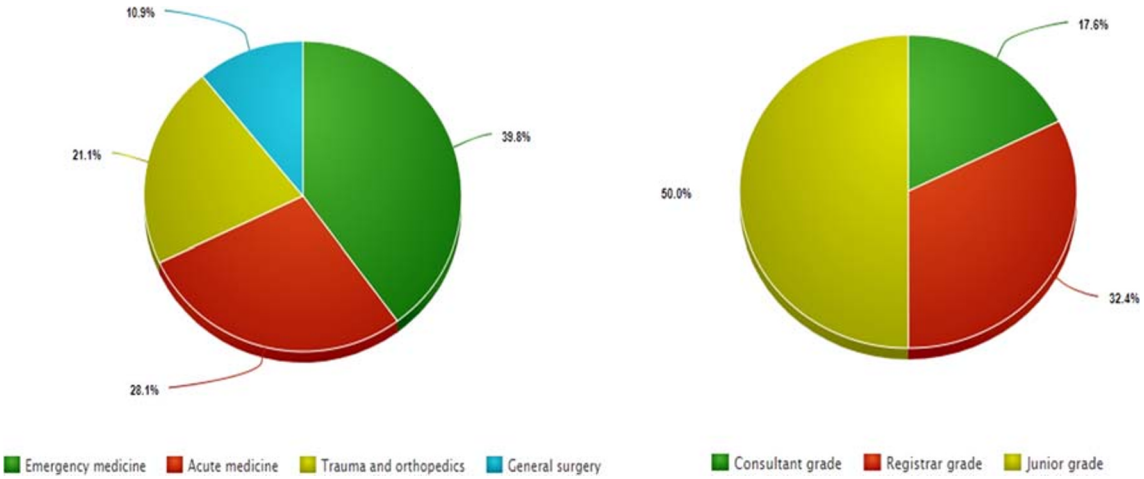

Fig. 1 Pie chart showing the distribution of the participating four specialties in the (**left** pie chart) and the distribution of the doctor grades participating (**right** pie chart)

are suffering from at least a moderate degree of burnout with the highest rates in general surgery. More detailed analysis of the different subscale measures revealed that, first at the personal burnout subscale, the highest mean score was in general surgery (mean = 57.44, SD = 14.26) followed by acute medicine (mean = 51.07, SD = 15.30), emergency medicine (mean = 50, SD = 14.40) and orthopaedics (mean = 43.36, SD = 17.64). Work-related burnout subscale revealed that, again, general surgery department had the highest total mean scores of 55.86 and an SD of 14.53 followed by emergency department (mean = 53.50, SD = 13.06), acute medicine (mean = 52.62, SD = 12.84) and orthopaedists (mean = 46.16, SD = 12.32). Lastly, by looking at patient-related burnout, acute medicine had the highest burnout scores scoring 35.29 and a standard deviation of 15.99 followed by emergency medicine (mean = 32.65, SD = 13.90) and orthopaedics (mean = 30.70, SD = 16.71) and finally general surgery scored a mean score 29.46 with a standard deviation of 15.62 (Table 1) (Fig. 2).

On analysis of the mean burnout scores as per staff grade, junior doctors had an overall burnout score of 53.42 with a standard deviation of 5.21, followed by consultants (mean = 49.65, SD = 10.74) and registrars (mean = 47.95, SD = 9.67). The total burnout scores showed that 7.0% ($n = 9$) had low burnout scores while 56.3% ($n = 72$) had moderate burnout and 36.7% ($n = 47$) had high burnout scores (i.e. mean above 50) (Fig. 3).

The data were plotted using Whisker plot to demonstrate dispersion of data among the four specialties under study (Fig. 4). Individual data are represented by circles while the mean is represented by a white diamond and median is represented by a thick blue line. The grey area is the 50th percentile while above and below are the 25th percentiles. Thin blue lines represent 1.5 standard deviation.

By further analysis of the data, a paired t test was performed to show if there is any significant difference between the results of the work-related subscale and that of the patient-related subscale. The mean difference of work-related minus patient-related subscale equals 18.52 (95% confidence interval of this difference, from 14.98 to 22.05). A two-tailed P value between the work-related and patient-related subscales was less than 0.0001. By conventional criteria, this difference is considered to be extremely statistically significant. This shows that work-related factors and working environment might be more detrimental to the occurrence of burnout rather than the patient-related factors and doctor-patient interactions. This finding might pave the way for more focus on improving the working environment and working hours and encouraging a more efficient organizational functionality in combating burnout among healthcare providers.

Table 1 Showing the means and standard deviations for each specialty in each of the three subscales of the Copenhagen burnout score

	Personal		Work-related		Patient-related	
Emergency medicine	Mean	50	Mean	53.50	Mean	32.65
	SD	14.40	SD	13.06	SD	13.90
Acute medicine	Mean	51.07	Mean	52.62	Mean	35.29
	SD	15.30	SD	12.84	SD	15.99
Trauma and orthopaedics	Mean	43.36	Mean	46.16	Mean	30.70
	SD	17.64	SD	12.32	SD	16.71
General surgery	Mean	57.44	Mean	55.86	Mean	29.46
	SD	14.26	SD	14.53	SD	15.62

Discussion

Work-related factors have been consistently found significantly related to burnout in multiple studies [13–15].

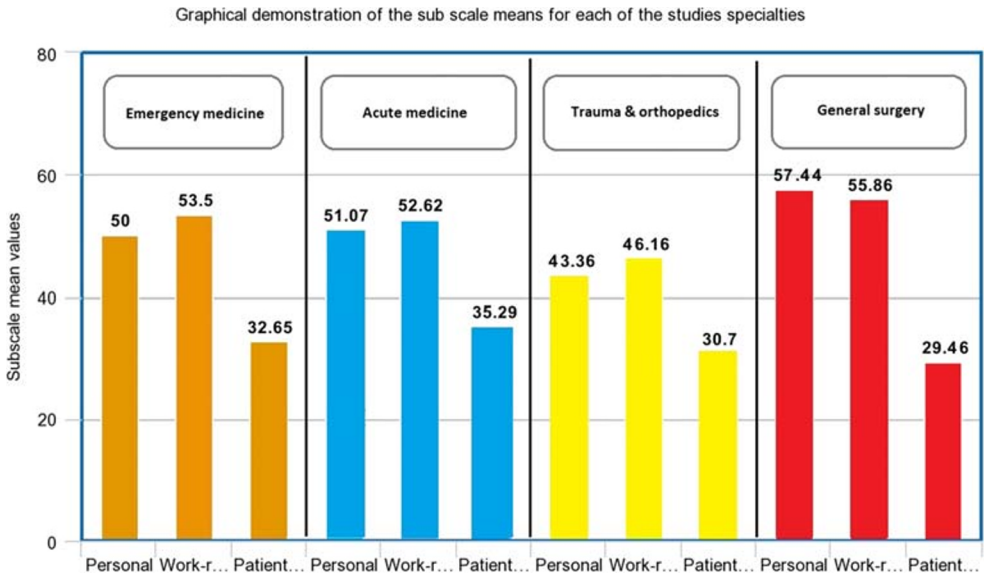

Fig. 2 Graphical demonstration of the subscale means for each of the studies' specialties

These burnout rates were found to be noticeably high among surgical specialties in comparison with other medical specialties [16]. Shanafelt et al. [7] concluded that burnout syndrome is likely to occur with trauma surgeons, urologists, otolaryngologists, vascular and general surgeons and younger healthcare professionals having children, longer working hours (more than 60 h per week) or having more calls per week than the usual (> 2 nights/week). Apart from the established relation between work environment and the specialty of practice and levels of burnout, certain demographic factors may accentuate the risk. These include young age, female gender, negative marital status and low levels of job satisfaction [17]. Being mindful of these risk factors may provide service providers and leaders with tools for identification of those doctors at greater risk and assist in screening.

There is a strong correlation between the work environment and the occurrence of burnout among doctors. Several positive aspects of the work environment are thought to lower levels of stress for staff and vice versa. When these positive attributes are absent in poorly functioning organizations, the risk for burnout may increase. Organizational functionality in general, individual satisfaction and feel of appreciation, family-work balance in relation to provision of kindergarten services and reduction of work hours or number of calls, opportunities for professional development for staff and finally a competent leadership are the bases for what defines a healthy work environment [18]. On the other hand, those working in environments which lack the aforementioned attributes may be at risk of experiencing burnout [19].

This significance of work environment was also highlighted by a study that found organizational factors, as opposed to illness severity of patients in an emergency department, were strongly associated with a higher level of burnout. Factors such as impaired work relationships with colleagues were found to be independently associated with higher burnout scores, whereas improved relationships with chief nurses and nurses were associated with a lower burnout score [20].

Regarding intervention measures for reversal of burnout, there has been a paucity of well-conducted studies and our armamentarium is mainly cornered on anecdotal reports of interventional strategies. However, there has been a great deal of movement and development in mental health and well-being initiatives in the UK, since the Black report in 2008 and Falmer and Stevenson document 'Thriving at work' 2017 [21].

More recently, Hasson and Butler [22] have identified the importance of a tiered approach in alignment to the thriving at

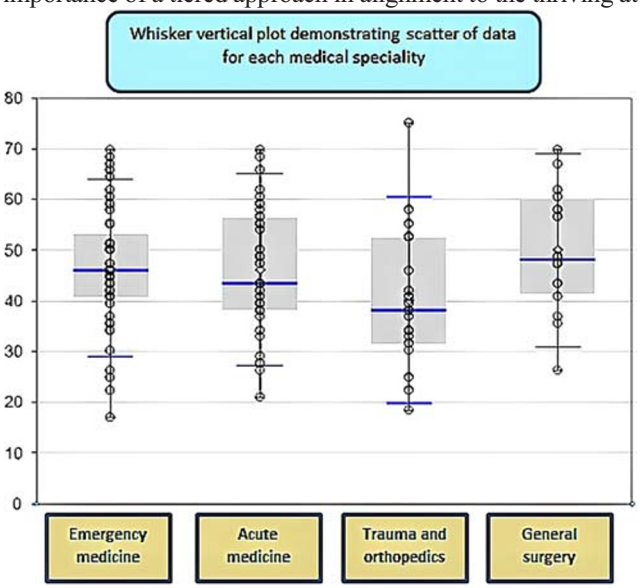

Fig. 4 Whisker plot showing dispersion of means among different subspecialties

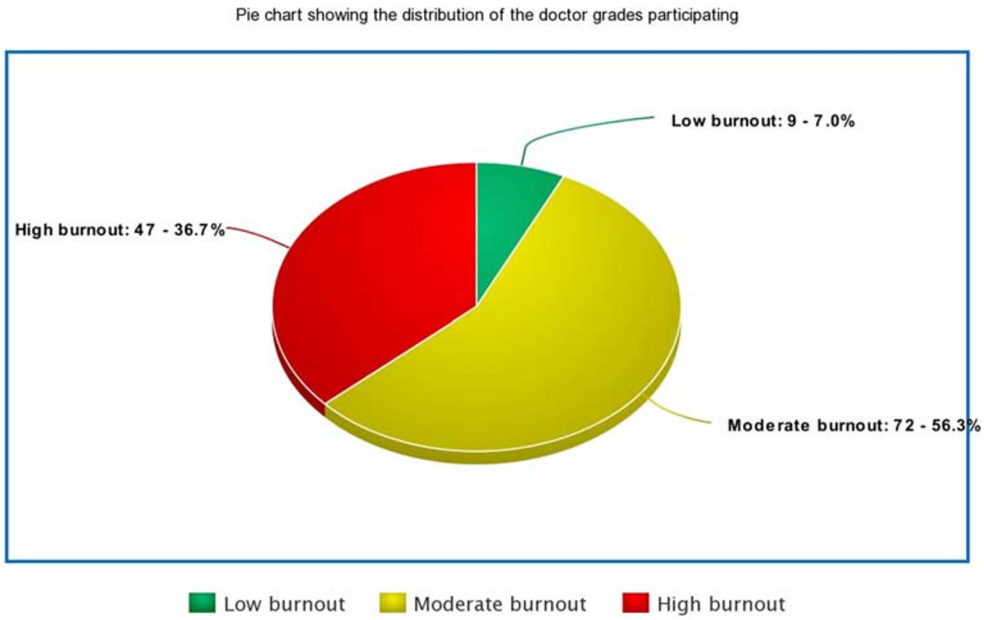

Fig. 3 Pie chart depicting the final categorisation of the study participants according to their burnout scores. Low burnout scores were identified as less than 25, while moderate and high burnout levels were identified as 25–50 and above 50 respectively

work recommendations, to supporting staff with acute stress, cumulative stress, burn out and trauma, providing 'in house' services with:

1. Proactive/ preventative measures
2. Maintenance of well-being and mental health issues
3. Crisis intervention and risk processes

Therapeutic interventions, according to Dutch psychiatrist Bessel van der Kolk, a lead researcher into trauma, states CBT approaches in therapy are not enough, and an integrated approach has to be considered [23].

Example of these strategies include participation in panel and group discussions, providing a list of resources to doctors including books, websites and contact information for experts and workshop leaders who are trained in combating burnout, having professional body policy acknowledging the specific occupational stressors faced by physicians and encouraging physician self-care through proper rest and exercise and setting limits on working hours [24].

One of the tools that could be implemented to combat burnout is a form of peer-support program that aims to promote help-seeking and peer to peer recognition of burnout similar to the Trauma Risk Management program and after-action reviews. The Trauma Risk Management (TRiM) has been implemented in the military and is basically a peer-delivered psychological support process, aiming towards ensuring that those who develop burnout are identified and are counselled. In its original presentation in the military, the Trauma Risk Management practitioners are volunteer non-medical personnel who have been trained in psychological risk assessment and provided with a basic understanding of trauma psychology [25]. Recognition of burnout and management should be done on both the horizontal (peer-peer) and the vertical (peer-team leader) levels. The dilemma lies in that disclosing mental health problems is highly stigmatized among doctors. Developing an open and honest culture that encourages help-seeking at an early stage is therefore crucial. This requires advocating more effective communication, self-awareness, support from colleagues, problem solving and decision-making skills.

In the UK, it has been estimated that approximately one-third of the physicians had features of burnout [14]. This was further confirmed by a more recent survey showing that nearly a third of 968 UK doctors (32%) responding reported feeling burnt out at some stage and 14% said they were even depressed [26].

In another survey by the General Medical Council (GMC) on more than 70,000 trainee and senior doctors, the question of burnout was raised [27]. The results showed that 25% of those in training and a 20% of trainers said they felt burnt out to a 'high' or 'very high' degree with emergency medicine ranking on the highest levels of burnout. It was postulated that workplace factors were the main key factors with heavy workloads, rota gaps and the lack of a supportive working environment. It was also predicted that these high levels of burnout experienced among different specialties might erode the quality of medical training and will eventually impact on the patient's safety.

In the frame of patient safety, a recent meta-analysis of 47 studies, which included 42,473 physicians, found that burnout was associated with a 2-fold increase in odds for unsafe care and unprofessional behaviour, such as not following treatment guidelines and poor quality of communication [28]. The study also found that patient satisfaction was three times more likely to be lower when doctors were experiencing burnout.

A limitation of this study is the relatively small population size. We believe from this sample data that the occurrence of burnout among the studied medical specialties at our institute is just the tip of the iceberg and that there is more to be unfolded. Directions for future research are to aim to increase the current data pool by including more medical specialties and non-medical healthcare providers in a multicentric study. This will provide with a clearer insight to the magnitude of the problem and better strategies to reverse it.

Conclusion

Burnout syndrome among healthcare providers is both a common and serious entity with devastating personal and professional consequences. According to our study, healthcare providers from different specialties and among different grades all suffer from varying degrees of burnout. The surgical specialties are those who are most vulnerable and have the highest burnout scores according to the Copenhagen burnout inventory (CBI).

Changes in the work environmental factors along with stress management programs might be promising solutions to manage burnout. However, there have been no rigorous studies that prove this.

More interventional research targeting medical students, residents and practicing physicians are needed in order to improve psychological well-being and professional career enjoyment as well as the quality of care provided to patients. However, prevention appears to be far more beneficial than treatment when it comes to burnout.

Compliance with ethical standards

Conflict of interest The authors declare they have no conflict of interest.

Ethical approval This is an observational study. The XYZ Research Ethics Committee has confirmed that no ethical approval is required.

Informed consent All participants gave an informed consent for publication purposes.

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