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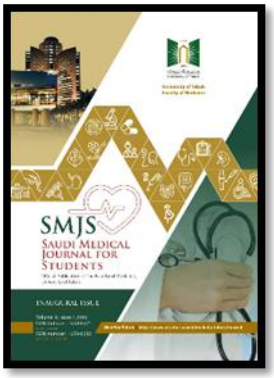

ORIGINAL RESEARCH ARTICLE

OCCUPATIONAL BURNOUT SYNDROME AMONG SURGICAL AND MEDICAL RESIDENTS IN SAUDI ARABIA: A MULTI-CENTER STUDY.

Lujain H Alturkistani[1*], Sarah A Khan[2], Rawan I Alqurashi[2], Abdulrahman F Alamri[2], Alwaleed S Aljabir[1], Abdulrahman A Aldakheel[3].

[1]College of Medicine, Taif University, Saudi Arabia, Medical Intern.
[2]College of Medicine, Taif University, Saudi Arabia, Medical Student.
[3]Department of Radiology Oncology, King Fahad Specialist Hospital, Riyad, Saudi Arabia.
***Corresponding author:** Lujain Hussain Alturkistani, Medical Intern, College of Medicine, Taif University, Taif city, 21944, Saudi Arabia. Tel: +966-581120254. E-mail: Lujain.turk95@gmail.com

ABSTRACT

Backgrounds: Burnout is prevalent among doctors and may result in medical errors with deleterious consequences on the whole community. Few researchers have studies burnout among doctors in Saudi Arabia, we aimed to assess Occupational Burnout Syndrome among surgical and medical residents in Saudi Arabia

Materials and Methods: A Cross-sectional study in Saudi major training centers, Saudi Arabia. A total of 412 medical and surgical residents selected my random method. This study carried out in April 2018 to April 2019 in the following cities Riyadh, Jeddah, Mecca, Dammam, Abha, Khamis Mushait, Taif, Tabuk, Albaha, Khobar, Medina, Dahran, Qatif, Hasa, Jizan. Data were collected by trained persons using Maslach Burnout Inventory for Health services workers testing burnout domains. Statistical analysis was carried out using the statistical package (SPSS.21). The questionnaire considered testing the three burnout domains beside some epidemiological parameters: age, gender, residency level, specialty and history of medical and psychological problems.

Results: Among 412 residents, 70.2% males, 29.8% females. Depersonalization 55.1%, Emotional exhaustion 57.3%, Personal accomplishment 54.4%. All age groups showed high prevalence of burnout the highest in 26 years old with total burnout 76. ($p < 0.05$)

Conclusion: In this national study we found a worrisome rate of burnout among surgical and medical residents in Saudi training program. emotional exhaustion is the most prevalent among medical residents followed by depersonalization among surgical residents, the sense personal accomplishment is the least prevalent compared to other burnout domains.

KEY WORDS: Burnout, Job stress, Medicine, General Surgery

INTRODUCTION

The first medical residents' burnout reports appeared in the United States of America in the mid-1970s [1]. Stress is defining in a term of a disruption of the equilibrium of the cognitive-emotional-environmental system by external factors [2]. Burnout is a syndrome of emotional exhaustion, depersonalization and reduced personal accomplishment that can occur among people who do work of some kind [3]. In Saudi Arabia, the prevalence of burnout syndrome in multinational nurses was estimated using three criteria: (42%) had depersonalization, (45%) had emotional exhaustion and (71.5%) had a sense of low personal accomplishment [4]. Burnout among American surgery residents was (69%) 566 American surgical residents [5]. In a study conducted in 1998 surveyed 482 internal medicine residents from all training programs found moderate levels of emotional exhaustion and high depersonalization in the second and third year [6]. Another study in a large academic hospital in Beirut measured burnout levels in the three domains emotional exhaustion (67.7%), depersonalization (47.1%), and personal accomplishment (37.4%) in third level residents [7]. Medical errors resulting from burnout were reported by 700 (8.9%) of 7,905 participating surgeons according to an American survey [8]. Cortisol is naturally synthesized from cholesterol in the adrenal cortex. Cortisol acts upon two types of receptors Mineralocorticoid receptors and that control the stress the other Glucocorticoid receptors (GR), which become extra sensitive toward cortisol in severe stress. The (GR) receptor in the hippocampus is responsible for memory consolidation and panicking. Stress has a negative impact on the immune system and it elevated circulating lymphocytes and increased levels of macrophages and natural killers cells [9]. Occupational burnout progresses in five stages.

Stage 1: Enthusiasm: When optimistic individuals spend a great deal of energy and work becomes the most important part of their life.

Stage 2: Stagnation: Life becomes limited to work and ignoring family and personal priorities.

Stage 3: Frustration: Individuals experience failure and doubt their sense of work.

Stage 4: Apathy: Persons are unable to change their situations and become resigned and indifferent.

Stage 5: Intervention: Individuals become helpless, less active and lose interest and they usually open to accepting help [10].

Job demands, job resources, exhaustion are risk factors to burnout. Occupational burnout presents with varies symptoms the biggest indicator of all is personal dysfunction; emotional exhaustion comes with the physical exhaustion and this interferes negatively with the patient care quality given by residents [11-12]. Repeated stress is usually accompanied with negative psychological outcomes like major depressive disorder [13], chronic fatigue syndrome, post-traumatic stress disorder, lack of drive, change in personality, sleep disorders, anxiety, lack of happiness fatigue and, above all, mental dysfunction and memory disturbances. Also, the development of alcohol and drug addiction [9,14-16]. Primary prevention starts with individual-centred solutions including: avoiding the job or changing work behaviours, changing organizations; secondary ones involve: early recognition and treating health-related issues; and tertiary ones involve rehabilitation [14,17]. Our aim to measure burnout domains among residents in Saudi training program in order to reduce medical errors.

MATERIAL AND METHODS

Study Design

A cross-sectional study carried out in government and private hospitals in Saudi Arabia between April 2018 to April 2019 in the following cities Riyadh, Jeddah, Mecca, Dammam, Abha, Khamis Mushait, Taif, Tabuk, Albaha, Khobar, Medina, Dahran, Qatif, Hasa, Jizan we surveyed the following general specialities: General surgery, Orthopaedic surgery, Plastic

surgery, Neurosurgery, Otolaryngology surgery, Oral and Maxillofacial surgery, Urology surgery, Internal medicine and neurology.

Sample size

Our sample size 412 residents. population size 3672 residents (2016 Saudi Commission for Health Specialities) [18] 5% margin of error and 95% confident level. We calculated the sample size using the sample size equation shown below. The minimum sample size is 348 residents

$$x = Z(c/100)^2 r(100-r) n = Nx/((N-1)E^2 + x) E = \mathrm{Sqrt}[(N-n)x/n(N-1)]$$

Inclusion criteria

- Surgical and medical residents in a Saudi training program both sexes, any age.
- Non- Saudi residents training in a Saudi training program.
- Residents training in ministry of health hospitals, armed forces hospitals and private hospitals.

Exclusion criteria

- Physicians training in subspecialty programs.
- Specialities involving both medical and surgical fields (paediatrics, gynaecology, oncology, urology, otorhinolaryngology)
- Residents training before April 2018 and after June 2018.

Methods and procedure

Data were collected from May 15th to August 6th. A group of medical students and medical interns were provided with hard copies of the questionnaires. Oral consents were obtained. A random sampling technique was used to recruit the participants of this study. A pilot study was done to test the questionnaire and to detect difficulties.

Data collection

The data were collected using a predesigned questionnaire, which consists (1) demographic data (sex, age, speciality residency program, region and nationality); (2) Maslach Burnout Inventory for Health Services Workers (MBI-HSS) was used in designing the questionnaires in English language. (MBI-HSS) studied items related to emotional exhaustion (EE), depersonalization (DP), and diminished feelings of personal accomplishment (PA): Three items investigated EE, three for DP and three for PA. Items comprising the scale are measured as 0 = never, 1 = a few times or less, 2 = once a month or less, 3 = few times a month, 4 = once per week, 5 = a few times a week, 6 = every day) for a total range of 0 – 18. Higher scores indicate greater emotional exhaustion and greater burnout in each domain. (MBI-HSS) is known to be valid as a previous study assessed the reliability of the (MBI-SS). A study found reliability value was 0.838, 0.844, 0.875 by applying Cronbach Alpha coefficient respectively for each domain [19]. A second study found high internal consistency with Cronbach's α coefficient values of 0.837, 0.869, and 0.881 across the three domains and reliability was high ($p < 0.001$) [20].

Ethical considerations

This study received approval from the Research Ethics Committee of Taif province, institutional review board and Taif University research committee approval. This study has been carried out in accordance with the code of Ethics of the World Medical association (Declaration of Helsinki) of 1975, as revised in 2000. A verbal consent was obtained from the participant.

Data analysis

The association between the three domains and multiple variants was determined using SPSS v21 (IBM, CHICAGO, USA). Pearson's Chi-square was used to assess correlations between occupational burnout and the other variables. Descriptive analysis was carried out to establish prevalence.

RESULTS

Our study surveyed 4,012 residents, 206 were training in medical specialities and 206 were training in surgical specialities. 70.2% male and 29.8% female, with a mean age of 27.89 years old (range = 26 - 45). 393 of responses were Saudi. Most residents were R1 (45.6%), followed by R2 (26%), R3 (12.1%), R4 (10%), R5 (2.9%), R6 (4%) and R7 (2.4%). The majority of the total responses came from training centres in Riyadh (32.3%), followed by Jeddah (19.7%) and Dammam (14.8%). DP (55.1%), EE (57.3%), PA (54.4%). Figure 1 presents the participation of medical and surgical specialities. We received the most responses from internal medicine residents and general surgery residents. Table 1 shows the frequency and percentage of high, moderate and low burnout among the three domains. Emotional exhaustion recorded the highest burnout of the domains while depersonalization and emotional exhaustion were equal. In relation to job performance, (70.4%) of residents dealt very effectively with the problems of their patients every day, (57.8%) of residents never felt like they don't care what happens to their patients, (23.5%) of residents treated some patients like they were impersonal objects only a few times a week and (26%) of residents felt emotionally drained from their work only a few times per week. Table 2 shows that the association between increased age and personal accomplishment (P=0.029). However, sex has highly associated with DP (P=0.003). Nationality had an increased association with emotional exhaustion (P=0.006) while region was significantly associated with depersonalization (P=0.064) and personal accomplishment (P=0.025). In addition, we found that surgical specialities had higher frequencies of high levels of depersonalization while medical specialities had higher frequencies of personal accomplishment and emotional exhaustion. Table 3 shows the highest score of 236 of emotional exhaustion concerning specialty, resident's nationality, and region. The least scores 2011 recorded are the association between age to personal accomplishment. In relation to the personal profile of the residents, we found that the most depersonalized and emotional exhausted age group was from 25 to 28 years. The highest was in 26 years old. Males showed high 285 EE, PA 121 and 285 DP, Saudi residents scored higher in all three domains dimensions than the non-Saudi residents.

DISCUSSION

This large national survey studied the magnitude of occupational burnout among the two major specialities: medicine and surgery. We observed many notable findings. The result of this study revealed a worrisome high rate of burnout in both public and private Saudi hospitals. This study revealed burnout in three domains emotional exhaustion, depersonalization and personal accomplishment. PA estimated to be higher in medical specialities rather than surgical specialities (P = 0.201), EE showed non-significant association to speciality (P = 0.242) and DP showed non-significant association to speciality (P=0.438). We expected surgeons to sustain higher levels of EE, our results found (53%) of surgical residents reported high EE, (32%) of American surgeons reported high EE. Surgeons stated high EE and tend to cause severe consequences to patient's health due to the interventional nature of surgical practice [21-22]. The main significant finding of this study is to explore resident's burnout negative impact on their job performance with potentially devastating consequences on patients, Severely burned out medical residents scored high level of medical errors due to lack of time comparing to moderately burned out residents (P = 0.013) [23]. In a previous study, Lebanese residents training in Lebanon recorded high levels of burnout through two domains: 0.09 for PA, 0.02 DP, and 0.20 EE on both major specialties [24]. The reason behind Lebanon residents' burnout is that Lebanon is ranked the 2nd of foreign countries by the number of medical graduates in contribution to United States of America (41%) of Lebanon residents are currently working in the USA [25-26]. Only a minority of Lebanon's postgraduate population intends to return to Lebanon after finishing their training abroad, mainly due to the lack of financial incentives, political instability and deficiencies in

leading residency programs; therefore, a huge workload is placed on the minority of remaining residents. In addition, Depersonalization is significantly associated through years of residency due to their extra shifts for supplemental income as it contributed to increased emotional exhaustion as well and lower the sense of personal accomplishment [24]. Our research found a significant association between male gender and high depersonalization (P = 0.003), North Carolina study sample found woman recording higher level of depersonalization (21.7%) than men (15.8%)[27]. Meta-analysis of relation between depersonalization to gender differences revealed men are more depersonalized than woman using 409 effects sizes from 183 studies (δ = -.19). Gender theory (Eagly, 1987) can provide explanation men are more associated to depersonalization due to men are less likely to express emotional feelings and more likely to shut off and withdraw themselves in stress situation, therefore increasing their depersonalization score [28]. In response to resident's long working hours, many countries have suggested limiting working hours improves impact on residents and patients (P<0.05), Residents quality of life ,(P <.05) [29].(34.7%) of American surgical residents anticipated a positive effect of work hours restriction on patient care [30]. Limiting working hours from ± 82.4 to ±74.8 among 1st postgraduate year improved EE (P=0.03), potentially improved DP (P=0.130) [31]. Lack of sleep found to be strongly associated to burnout with Maslach Burnout Inventory Burnout Scales (P<0.04) [32].The majority of residents in King Fahad University Hospital in Saudi Arabia were found to have acute sleep deprivation and more than half of them had chronic sleep deprivation while two-thirds reported having mild or moderate to severe depressive symptoms [33]. Four contributing factors have been proposed for "stressful feelings" including major career decisions, greater financial difficulties, depression, and anxiety. (P = 0.46) [34]. Strategies suggested include limiting work hours, improving schedules, matching residents with their cities and providing education on positive coping mechanisms to manage stress.

Limitations

Although our study has achieved its aim, there are some limitations. The study was conducted in only four centers, was a cross-sectional, and the reliance on a self-administered questionnaire.

CONCLUSIONS

In conclusion, personal accomplishment (P = 0.201) and emotional exhaustion (P = 0.242) were insignificantly higher among medical than surgical residents, while depersonalization (P=0.438) was insignificantly higher among surgical than medical residents. Surgical residents were more depersonalized than medical residents, however, the two other domains were still high in the medical field. Factors contributing to burnout elevation include work stresses and increased workloads and work hours. Decreasing burnout rates is crucial to improve medical care quality, reduce medical errors and prevent psychological disorders among residents.

We recommend future researches to study the common causes of stress in relation to burnout such as immigration, Living alone in terminal city, Financial problems, Number of children, history of medical and psychological disorders.

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Table 1 Proportion of residents with different burnout levels in the three domains.

Domain/burnout level	EE1	DP2	PA3
Low	81 (19.7%)	97 (23.5%)	97 (23.5%)
Moderate	95 (23.1%)	88 (22.1%)	91 (22.1%)
High	236(57.3%)	227(54.4%)	224(54.4%)

(1) Emotional exhaustion, (2) depersonalization, (3) Personal accomplishment.

Table 2 Association of resident's burnout domains to selected demographic data.

Variants	EE1 p Value*	DP2 p Value*	PA3 p Value*
Age	0.154	0.284	0.029
Sex	0.650	0.003	0.381
Speciality	0.242	0.438	0.201
Residency level	0.630	0.218	0.422
Nationality	0.006	0.349	0.460
Region	0.056	0.064	0.025

(1) Emotional exhaustion, (2) depersonalization, (3) Personal accomplishment.

Table 3 Proportion of residents with different burnout levels by demographic levels.

Variants	Low burnout	Moderate burnout	High burnout	total
Age EE1	78	88	223	389
Age DP2	91	80	218	389
Age PA3	94	84	211	389
Sex EE1	81	92	233	406
Sex DP2	95	86	225	406
Sex PA3	97	91	218	406
Speciality EE1	81	95	236	412
Speciality DP2	97	88	227	412
Speciality PA3	97	91	224	412
Residency level EE1	81	95	126	412
Residency level DP2	97	88	227	412
Residency level PA3	97	91	224	412
Nationality EE1	81	95	236	412
Nationality DP2	97	88	227	412
Nationality PA3	97	91	224	212
Region EE1	81	95	236	412
Region DP2	97	88	227	412
Region PA3	97	91	224	412

(1) Emotional exhaustion, (2) depersonalization, (3) Personal accomplishment.

Figure 1 Numbers of responses in different medical and surgical specialities.