

Job Stress and Burnout among Academic Career Anaesthesiologists at an Egyptian University Hospital

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الإجهاد الوظيفي واستنفاد الطاقة لدى أطباء التخدير ذوي المستقبل الأكاديمي في مستشفى مصري جامعي

طارق شمس و رجاء المصري

المخلص: الهدف: هناك العديد من الأدلة الدامغة على أن التخدير هو مهنة مجهدة، وعندما تكون هذه المهنة المجهدة مرتبطة بالمستقبل الأكاديمي يكون معدل الإجهاد والاحتراق الداخلي ونفاذ الطاقة أكثر. تهدف هذه الدراسة إلى تقييم معدلات التنبؤ وانتشار الإجهاد الوظيفي ونفاذ الطاقة، وكذلك استكشاف الخصائص الاجتماعية والملاح الوظيفية المصاحبة لدى عينة من أطباء التخدير المصريين ذوي المستقبل الجامعي. الطريقة: أجريت دراسة المسح المقطعي العرضي في مستشفى جامعة المنصورة في مصر على 98 طبيب تخدير من ذوي المستقبل الأكاديمي. تم استخدام إصدار اللغة الإنجليزية لقائمة جرد استنفاد الطاقة لماسلاش ومقياس التعامل مع ضغوط العمل للمعهد الأميركي لقياس معدل الإجهاد والاحتراق الوظيفي. تم تحليل البيانات وفقاً للدلائل الإرشادية لمعالجة البيانات وتحليلها من المقاييس المستخدمة. النتائج: بلغت نسبة المشاركة في هذه الدراسة 73.1% حيث كان 69.4% يعاني من الضغط الوظيفي، 62.2% من الاستهلاك العاطفي، 56.1% من تبديد الشخصية و 58.2% من نقص القدرة على الانجاز. وقد كان هناك ارتباط إيجابي بين الإجهاد الوظيفي وسلام القياس الفرعية الثلاث لنفاذ الطاقة لماسلاش. كان الأطباء المقيمين والمدرسين المساعدين هم الأكثر الفئات تضرراً. أثبت التحاليل أن أقوى مؤشر وحيد للتنبؤ بجمع أبعاد الضغط الوظيفي ونفاذ الطاقة هو عدم وجود الدعم الوظيفي. الخلاصة: سبب الإجهاد الوظيفي ونفاذ الطاقة عند أطباء التخدير الأكاديميين هو عدم وجود الدعم الوظيفي وهذا أكثر انتشاراً عند الأطباء المقيمين والمدرسين المساعدين. أطباء التخدير الأكاديميين هم في حاجة إلى إستراتيجية مؤسسية منظمة تنظيماً جيداً للتخفيف من حدة مطالبهم الأكاديمية الثقيلة والدعم الوظيفي بهدف التخفيف من الضغط والاحتراق الوظيفي.

مفتاح الكلمات: الإجهاد الوظيفي؛ الإنهاك والاحتراق الداخلي؛ أطباء التخدير ذوي المستقبل الأكاديمي؛ مصر.

ABSTRACT: Objectives: There is compelling evidence that anaesthesiology is a stressful occupation and, when this stressful occupation is associated with an academic career, the burnout level is high. This study aimed to assess the predictors and prevalence of stress and burnout, associated sociodemographic characteristics, and job-related features. **Methods:** A cross-sectional survey study was carried out at Mansoura University Hospital in Egypt among 98 anaesthesiologists who had academic careers. The English version of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) scale and the Workplace Stress Scale of the American Institute of Stress were used to measure job stress and burnout. Data were analysed according to the guidelines for data processing and an analysis of the scales used. **Results:** The participation rate of this study was 73.1%, where 69.4% were encountering job stress, while 62.2% experienced emotional exhaustion, 56.1% depersonalisation, and 58.2% reduced personal capacity. There was a significant positive correlation between job stress and MBI-HSS subscales. Residents and assistant lecturers were the most affected group. The strongest significant single predictor of all burnout dimensions was a lack of job support. **Conclusion:** Stress and burnout among academic anaesthesiologists were caused by the lack of job support; this was especially true among residents and assistant lecturers. We can conclude that a well-organised institutional strategy to mitigate the heavy professional demands of academic anaesthesiologists' will relieve their stress and burnout.

Keywords: Job stress; Burnout; University career anesthesiologists; Egypt.

ADVANCES IN KNOWLEDGE

- There have only been limited studies carried out in the Arab world about the effects of the great increase in the demand-supply gap for anaesthesiologists. No study of the effect of their workload has been undertaken, especially if they are involved in research and teaching and shoulder administrative responsibilities; thus, this study contributes new information.
- The results of this study have revealed that residents and assistant lecturers were the most affected group of anaesthesiologists, indicating that their heavy academic demands, in comparison to that of others, plays a role in their greater stress and burnout.

APPLICATIONS TO PATIENT CARE

- *This study showed that the strongest significant single predictor of burnout among academic anaesthesiologists was a lack of job support, which indicates that a well-organised institutional strategy to support them may ameliorate their stress and burnout, and consequently improve patient care.*
- *Anaesthesiologists should be trained to cope with their long term heavy demands in order not to be vulnerable to stress and burnout. This will result in better standards of patient care.*

BURNOUT MAY BE THE RESULT OF unrelenting stress but it is not the same as too much stress. Stressed people can imagine that if they could only get everything under control, they would feel better.¹ In contrast, burnout syndrome is a prolonged response to chronic job-related stressors.² Maslach and Jack first described this condition, which is characterised by emotional exhaustion, feelings of low personal accomplishment, and depersonalisation.³ Emotional exhaustion is the subjective sense of fatigue related to one's work. A feeling of low personal accomplishment is a feeling of frustration with work-related achievements. Depersonalisation is a person's attempt to separate himself or herself from his or her work as a defense mechanism.⁴ However, handling job stress in general may help to prevent burnout in one's career.¹

Anaesthesiology has been identified as a stressful specialty.⁵ Hospital anaesthesiologists' scope of work has now expanded to include emergency and intensive care, and management of acute and chronic pain. In addition, some anaesthesiologists engage in research and teaching, and shoulder administrative responsibilities. Consequently, the gap between the demand for and the supply of aesthesiologists has greatly increased, and those who are working in the field are overworked. It has been reported that, although anaesthesiology may be stressful, anaesthesiologists develop coping mechanisms over time. Even inexperienced trainee anaesthesiologists seem to be vulnerable.⁶

With this in mind, we aimed to assess the prevalence of job stress and burnout among a group of university career anesthesiologists working at Mansoura University Hospital (MUH), Egypt. Furthermore, we aimed to investigate the associated sociodemographic features, job characteristics, and working conditions with reference to the strongest predictor of the addressed syndromes.

Methods

A cross-sectional survey study was carried out in the Anaesthesia Department of MUH in Mansoura, Egypt. During the study period (March–June 2011), MUH had a total of 134 anesthesiologists. Out of those, there were 42 residents, 33 assistant lecturers, 27 lecturers, 15 assistant professors and 17 professors. Following approval by the Institutional Review Board of MUH, the researchers introduced themselves to anaesthesiologists in different centres affiliated to MUH, the informing them about the aims of the study, and guarantees of anonymity and confidentiality. Staff gave verbal consent and were allowed to respond voluntarily to the survey in their own time and privacy, with a nearly 73% response rate.

An anonymous self-administered questionnaire consisting of 4 parts was constructed to collect data. Part 1 gathered sociodemographic data, Part 2 data about job characteristics and working conditions, while Part 3 was a job stress scale, and Part 4 was the Maslach Burnout Inventory-Human Services Survey (MBI-HSS).

Job characteristics and working conditions included in the questionnaire were derived by reviewing the literature and the work situations at Egyptian university hospitals, as well as by holding informal discussions with a group of anaesthesiologists to explore their opinions. A total of 8 attributes were listed and the anaesthesiologists' statements were grouped according to academic status, job demands, how their work time was spent, distribution of duties throughout the week, number of shifts per month, availability of work vacations and job support, and the nature of their work in anaesthesia.

Our job stress questionnaire was the Workplace Stress Scale™ created by the American Institute of Stress (AIS). The 10 questions evaluate how much job stress is present and how workers handle it. Participants were asked to rate stress based on a 10-point scale ranging from 'strongly disagree' to

Table 1: Job characteristics and working conditions of the studied anaesthesiologists

Job characteristics	n	%
Academic status		
Professor	8	8.2
Assistant professor	12	12.2
Lecturer	16	16.3
Assistant lecturer	32	32.7
Resident	30	30.6
Job demands both physical and mental effort		
Yes	78	79.6
No	20	20.4
Work time directed mainly to		
Patient care only	21	21.4
Research only	0	0
Both	77	78.6
On duty all week		
Yes	62	63.3
No	36	36.7
Shifts per month		
≤6 shifts	37	37.8
>6 shifts	61	62.2
Availability of vacations		
Yes	59	60.2
No	39	39.8
Job support*		
Yes	40	40.8
No	58	59.2
Anaesthesia work is boring		
Yes	71	72.4
No	27	27.6

*Job support included availability of 1) work equipment; 2) efficient, helpful co-workers, and 3) supportive supervisors.

‘strongly agree’. Each question was scored between 1 and 10. A total score between 10 and 30 indicated good handling of job stress; between 40 and 60 indicated moderately well-handled job stress, and between 70 and 100 indicated that an employee was encountering problems that needed to be addressed and resolved.⁷ Only the data of those who had job stress are presented in this study.

The MBI-HSS comprises 22 items measuring 3 subscales of burnout: emotional exhaustion,

Table 2: Prevalence of burnout subscales and job stress among the studied anaesthesiologists

Subscales*	n	%	P value
Emotional exhaustion	61	62.2	0.651
Depersonalisation	55	56.1	
Reduced personal capacity	57	58.2	
Encountering job stress	68	69.4	

*Categories are not mutually exclusive.

depersonalisation, and personal accomplishment. Respondents score items on a scale from zero to 6: 0 = never; 1 = a few times a year; 2 = once a month; 3 = a few times a month; 4 = once a week; 5 = a few times a week, and 6 = every day. The scores were reflected as a high score in the first two scales and a low score in the last subscale of burnout. The questionnaire does not express the total value of burnout; the 3 subscales are calculated independently with the individual dimensions, and therefore the degree of burnout is expressed by the scores of its 3 subscales rather than by a total score.⁸ Only respondents who were above the level of burnout for every subscale are reported here. The MBI-HSS is an effective tool of proven reliability and validity in detecting the presence of and assessing the degree of burnout in service workers.

A pilot study was done on 8 anaesthesiologists from the Anesthesia Department at MUH who were not included in the full-scale study. During this pilot study, the English version of the MBI-HSS was tested for clarity of questions and simplicity of language. The English version of the inventories were used since our participants were Egyptian academic anaesthesiologists both educated and working in an English language environment.

Data were analysed using Statistical Package for Social Science (SPSS), Version 11 (IBM, Inc. Chicago, Illinois, USA). Descriptive statistics were presented as numbers and percentages. Burnout and handling job stress scores and levels were calculated according to the guidelines of the inventories, and the Pearson's correlation test was used to determine the relationship between them. A chi-squared test was used for comparison between career groups of anaesthesiologists. The effects of different variables on the level of burnout and job stress were investigated by calculating the odds ratios in univariate analysis. A stepwise multivariate analysis was also conducted by using logistic regression.

Table 3: Distribution of burnout subscales and encountering job stress according to the sociodemographic characteristics of the studied anesthesiologists

Sociodemographic characteristics	Emotional exhaustion n = 61 n (%)	Depersonalisation n = 55 n (%)	Reduced personal capacity n = 57 n (%)	Encountering job stress n = 68 n (%)
Age				
≤35 years	50 (81.9)	45 (81.8)	45 (78.9)	56 (82.4)
>35 years	11 (18)	10 (18.2)	12 (21.1)	12 (17.6)
<i>P</i> value	0.003*	0.000*	0.000*	0.000*
Gender				
Male	46 (75.4)	41 (74.5)	42 (73.7)	51 (75)
Female	15 (24.6)	14 (25.5)	15 (26.3)	17 (25)
<i>P</i> value	0.58	0.785	0.955	0.61
Residence				
Urban	46 (75.4)	41 (74.5)	44 (77.2)	53 (77.9)
Rural	15 (24.6)	14 (25.5)	13 (22.8)	15 (22.1)
<i>P</i> value	0.004*	0.006*	0.04*	0.021*
Marital status				
Single	20 (32.8)	16 (29.1)	17 (29.8)	23 (33.8)
Married	41 (67.2)	39 (70.9)	40 (70.2)	45 (66.2)
<i>P</i> value	0.005*	0.138	0.08	0.000*
Number of children				
0 children	21 (34.4)	17 (30.9)	18 (31.6)	24 (35.3)
1 child	14 (22.9)	13 (23.6)	12 (21.1)	15 (22.1)
≥2 children	26 (42.6)	25 (45.5)	27 (47.4)	29 (42.6)
<i>P</i> value	0.000*	0.006*	0.02*	0.000*
Job of spouse**				
Physician	41 (54.7)	39 (52)	40 (53.3)	45 (60)
Others	25 (60.9)	23 (58.9)	25 (62.5)	28 (62.2)
Others	16 (39)	16 (41)	15 (37.5)	17 (37.8)
<i>P</i> value	0.008*	0.003*	0.023*	0.008*
Income				
Able to save	12 (19.7)	13 (23.6)	13 (22.8)	12 (17.6)
Satisfactory	37 (60.7)	31 (56.4)	32 (56.1)	42 (61.8)
Not satisfactory	12 (19.7)	11 (20)	12 (21.1)	14 (20.6)
<i>P</i> value	0.01*	0.193	0.09	0.000*

*Significant at $P \leq 0.05$ level. Categories are not mutually exclusive; **The overall rate of burnout was calculated according to the total number of married participants (75).

A *P* value of ≤ 0.05 was considered statistically significant.

Results

Most of our sample were males (73.5%) aged ≤ 35 years (65.3%), living in urban settings (83.7%), where they were married (76.5%) with ≥ 2 children (59.2%). Most of the studied anesthesiologists (73.3%) were

Table 4: Distribution of burnout subscales and job stress according to job characteristics and working conditions of the studied anaesthesiologists

	Emotional exhaustion[†] n = 61 n (%)	Depersonalisation[†] n = 55 n (%)	Reduced personal capacity[†] n = 57 n (%)	Encountering job stress[†] n = 68 n (%)
Academic status				
Professor (8)	0	1 (1.8)	1 (1.8)	0
Asst. professor (12)	5 (8.2)	3 (5.5)	5 (8.8)	5 (7.4)
Lecturer (16)	3 (4.9)	3 (5.5)	3 (5.3)	4 (5.9)
Asst. lecturer (32)	27 (44.3)	27 (49.1)	26 (45.6)	29 (42.6)
Resident (30)	26 (42.6)	21 (38.2)	22 (38.6)	30 (44.1)
<i>P</i> value	0.000*	0.000*	0.000*	0.000*
Job demands both physical and mental effort				
Yes (55)	39 (63.9)	37 (67.3)	37 (64.9)	44 (64.7)
No (43)	22 (36.1)	18 (32.7)	20 (35.1)	24 (35.3)
<i>P</i> value	0.045*	0.012*	0.039*	0.010*
Work time is directed mainly to				
Patient care only (21)	17 (27)	34 (61.8)	33 (57.9)	21 (30.9)
Research only (0)	0	0	0	0
Both (77)	44 (72.1)	43 (78.2)	44 (77.2)	47 (69.1)
<i>P</i> value	0.046*	0.915	0.695	0.001*
On duty all week				
Yes (62)	53 (86.9)	48 (87.3)	48 (84.2)	59 (86.8)
No (36)	8 (13.1)	7 (12.7)	9 (15.8)	9 (13.2)
<i>P</i> value	0.000*	0.000*	0.000*	0.000*
Shifts per month				
≤6 shifts (37)	9 (14.8)	8 (14.5)	10 (17.5)	9 (13.2)
>6 shifts (61)	52 (85.2)	47 (85.5)	47 (82.5)	59 (86.8)
<i>P</i> value	0.000*	0.000*	0.000*	0.000*
Availability of work vacations				
Yes (59)	32 (52.5)	30 (54.5)	33 (57.9)	34 (50)
No (39)	29 (47.5)	25 (45.5)	24 (42.1)	34 (50)
<i>P</i> value	0.04*	0.196	0.582	0.002*
Job support*				
Yes (40)	20 (32.8)	17 (30.9)	18 (31.6)	22 (32.4)
No (58)	41 (67.2)	38 (69.1)	39 (68.4)	46 (67.6)
<i>P</i> value	0.038*	0.024*	0.028*	0.01*
Anaesthesia work is tedious and boring				
Yes (71)	49 (80.3)	45 (81.8)	47 (82.5)	51 (75)
No (27)	12 (19.7)	10 (18.2)	10 (17.5)	17 (25)
<i>P</i> value	0.025*	0.02*	0.009*	0.39

[†] = categories are not mutually exclusive; * = significant at $P \leq 0.05$ level.

Note: Job support included availability of 1) work equipment; 2) efficient helpful co-workers, and 3) supportive supervisors.

married to physicians, and 53.1 % had a satisfactory income. The job characteristics of the studied group are presented in Table 1. Most respondents were assistant lecturers (32.7%) or residents (30.6%).

The overall prevalence of those experiencing burnout and job stress among academic anaesthesiologists is shown in Table 2. Out of 98 staff, more than half met the criteria for all burnout subscales, while the percentages of those who were suffering emotional exhaustion, depersonalisation, and reduced personal capacity were 62.2%, 56.1%, and 58.2%, respectively. More than two-thirds of the respondents (69.4%) were encountering job stress as defined by AIS's Handling Job Stress Scale. Our results reveal that job stress positively correlated with all burnout subscales with highly significant differences.

Table 3 shows the associated sociodemographic characteristics for job stress and each subscale of the MBI-HSS. All dimensions of job stress and burnout were much higher among anaesthesiologists who were males ≤35 years of age, urban residents, married (especially to physicians), had ≥2 children, and had a satisfactory income. The prevalence of MBI-HSS subscales and job stress by various job characteristics and working conditions of the studied group are shown in Table 4. Compared to other groups, assistant lecturers showed significantly higher rates of burnout, while residents

expressed the most significant higher rate of job stress ($P < 0.001$).

Univariate and multivariate regression analysis are presented in Table 5 (not all data of the univariate analysis are presented). Although the stepwise logistic regression analysis failed to confirm the significance of all identified predictors of encountering job stress, it succeeded in confirming the significance of some predictors related to burnout subscales that were identified by univariate analysis. These were age ≤35 years (odds ratio [OR] = 0.15) and lack of job support (OR = 13.79) for emotional exhaustion, while only lack of job support was confirmed for depersonalisation (OR = 16.24) and reduced personal capacity (OR = 19.24).

Discussion

This study assessed the prevalence of job stress and burnout among a group of Egyptian university career anaesthesiologists. There is a common perception that working in anaesthetics is stressful, especially if it is associated with academic demands. Although other studies on anaesthesiology used different metrics, were applied to different subgroups and conducted in different countries, their results provide compelling evidence that it is burnout, more than stress, which constitutes a

Table 5: Univariate and multivariate logistic regression analysis of the predictors of job stress and the Maslach Burnout Inventory-Human Services Survey subclasses among the studied anaesthesiologists (not all data are displayed)

Predictor		Univariate			Multivariate		
		P	UOR	95% CI	P	AOR	95% CI
Emotional exhaustion							
Age (years)	≤35		0.435			0.152	
	>35	0.028*	1 (r)	0.207–0.91	0.037*	1 (r)	0.026–0.89
Job support	No		3.600			13.972	
	Yes	0.000**	1 (r)	1.787–7.25	0.019*	1 (r)	1.549–126.01
Depersonalisation							
Job support	No		2.538			16.238	
	Yes	0.004**	1 (r)	1.336–4.82	0.050*	1 (r)	1.001–263.38
Reduced personal capacity							
Job support	No		3.182			19.239	
	Yes	0.001**	1 (r)	1.616–6.26	0.008**	1 (r)	2.178–169.90

P = P value; UOR = unadjusted odds ratio; CI = confidence interval; AOR = adjusted odds ratio; r = reference group.
*significant at $P \leq 0.05$; **highly significant at $P \leq 0.001$.

significant problem for ~40% of anaesthesiologists.⁹ This common perception was emphasised again in this study, which generally expressed a high prevalence of stress and burnout among MUH's anaesthesiologists.

The present study revealed that more than 50% of our respondents suffered from stress. The higher overall prevalence of stress in the current study as compared to other studies could be explained by the fact that whether or not an individual perceives a work demand as stressful depends upon their personal, social, and biological resources; these may buffer the impact of job demands on job strain, including burnout. It was therefore crucial to investigate the social and job characteristics of anaesthesiologists that could be associated with job stress and burnout. This study revealed that more than two-thirds of academic anaesthesiologists encountered job stress and this stress, as expected, correlated significantly with increased rates of all dimensions of burnout.

Additionally, significant scores on all of these burnout subscales were more evident among assistant lecturers than residents, while nearly all professors were able to deal with job stress more effectively. The latter's scores were below average in all subscales. These findings could be explained by the fact that postgraduate medical study in all specialties, including anaesthesia, requires a lot of mental and physical effort. This burden increases if the anaesthetist then chooses to follow an academic career. In Egypt, in order to advance to a higher grade in any specialty, a person must invest 3 years of teaching, research, publication, and study. Additionally, candidates must write theses and pass examinations. These heavy academic demands, in addition to the already stressful nature of working as an anaesthetist, could explain the finding that assistant lecturers and residents were the groups most affected by stress and burnout. Abut *et al.* reported that trainees felt they lacked control in their own field, which may cause feelings of inadequacy and result in low scores on a sense of personal accomplishment.¹⁰ This may explain the increase in the perceived stress scale in residents.

Very few professors in our survey were affected by the problem. This result could be explained by the fact that, in our country, as academic anaesthesiologists grow older and achieve higher positions, they become accustomed to managing

stress and coping with stressors. They are also able to adapt their working environment to reduce stress, for example by working fewer hours and less shifts. Additionally, most of their working hours are allocated to mentoring junior staff in research and clinical training.

Burnout is stress-related. Some jobs simply cause more stress, taking more of a toll on the workforce and resulting in much higher rates of burnout than others. Workers are at higher risk of burnout if 1) the requirements of the job are unclear; 2) the job's responsibilities exceed the amount of time given to complete it properly; 3) there is an intense workload without downtime for recovery; 4) the overall work experience is stressful as, for example, in the case of a risk of a lawsuit; 5) there is a lack of personal control over one's work environment and daily decisions; 6) workers are not appreciated or their accomplishments recognised; 7) there is poor communication in the workplace; 8) job demands are unrealistically high, or 9) there is low financial compensation, or 10) there is poor support or leadership.¹¹

The most important finding of our study is the complex relationship between career-related demands, job stress, burnout, and the sociodemographic and job characteristics of the subjects. Social demands and life stressors represent a burden that could explain our findings of a higher prevalence of job stress and burnout among younger anaesthesiologists, especially in those with a just satisfactory income who are married to physicians and have ≥ 2 children. In Egypt, it is common for academics to marry academics as they can easily understand the work demands of their spouse and relate more easily to one another. This is confirmed by our results which showed that 73.3% of the respondents were married to physicians. This could also explain the significantly higher rates of stress and burnout among them when compared to other groups. Contrary to our result, other researchers have reported that marriage and family responsibilities acted as a sort of social support. Abut *et al.* found that anaesthesiologists with ≥ 2 children had a feeling of significantly higher personal accomplishment with low depersonalisation and emotional exhaustion scores. Castelo-Branco *et al.* found that being single was a predisposing factor for the development of burnout.¹² It is interesting to note that the male anaesthesiologists in this

study had higher rates of stress and burnout than the females, which could be explained by the fact that most of our sample were male (73.5%) and that traditionally bringing up children is perceived as a personal accomplishment for women in Egypt. The maternal experience may prevent the development of depersonalisation. This finding is similar to that of a Turkish study that revealed that female anaesthesiologists have a feeling of higher personal accomplishment but lower depersonalisation scores than males.¹¹

Although various personal, interpersonal, and organisational factors have been reported to relate to job stress and burnout in the medical environment, several studies have emphasised the importance of extrinsic work-related stressors and organisational factors rather than personal factors.¹³⁻¹⁶ When the current study examined job-related stressors and working conditions that can be associated with burnout, the finding was that working in anaesthesia while engaging in an academic career was more stressful, because anaesthesiologists who were loaded by physical and mental demands of these two tasks were significantly more stressed and eventually burned out. Moreover, this study confirmed that an intense and heavy workload, as well as the lack of job support was generally a strongly significant determinant for job stress. Anaesthesiologists who spent most of their work time engaged in both patient care and research activities, were assigned duties on varying shifts throughout the week, took more than 6 different shifts per month, and were lacking job support expressed higher rates of job stress and scored higher on all burnout subscales. The availability of vacation time was not an effective variable in this study.

Our findings reflected both similarities and differences with other studies. For example, a study conducted on Turkish physicians found that those who worked more shifts and took fewer vacations per year seemed to be at higher risk for burnout.² Another study attributed the highest burnout scores among those working in health centres to heavy patient loads and long working hours.¹⁷ The difference in the prevalence and determinants of burnout between our study and others could be explained by the differences in culture and medical specialties. These differences in the nature and characteristics of the work-related demands appear to affect the relative prevalence and scores of stress

and burnout; thus, it is difficult to reach universal conclusions. Furthermore, our finding that 72.4% of those polled responded that anaesthesia is "boring" could explain the higher rate of burnout in this survey as compared to other studies. All dimensions of burnout in our study were much more prevalent than in other studies.

According to the stepwise logistic regression analysis of our data, the strongest significant single predictor for all MBI-HSS subscales was a lack of job support, which was expressed as deficient work equipment; uncooperative or inefficient co-workers, and unsupportive supervisors. Our study did not confirm the findings of researchers who reported that the strongest single predictor of burnout (emotional resilience and personal accomplishment) among different groups of physicians was the control over their work schedule and the number of hours worked.¹⁸ De Oliveira *et al.* mentioned low job satisfaction and a lack of family support as significant predictors of a high burnout risk among anaesthesiology chairs.⁵ Another study carried out among Turkish physicians concluded that the most significant and common predictors of all burnout dimensions were the low number of vacations at the individual level and the public ownership of healthcare facilities at the group level.²

Our study has several limitations. First, although we used validated measures of each construct, our measures of job stress and burnout may not have completely and accurately captured each anaesthesiologist's feelings. Second, the cross-sectional design of our study may have created difficulties in ascertaining causality. Additionally, the use of self-reported data collection at one point in time necessitates that care should be taken when drawing conclusions about the effects of working conditions on job stress or burnout. Third, we chose to study anaesthesiologists with academic careers, so our results may not be generalised to all anaesthesiologists.

However, we believe that the results of this study will not only help facilitate a better understanding of Egyptian academic anaesthesiologists with their heavy academic demands, job characteristics and key social features, but will also be useful in following up the results of structural changes in Egyptian medical colleges, and in launching healthcare reforms. Studies should also be undertaken to compare the current findings with

the experience of non-academic anaesthesiologists. Studies evaluating system-level interventions designed to optimise workloads, improve efficiency, modify the burden of academic demands on anaesthesiologists, and promote a culture of compassion, engagement, meaning, and support, are urgently needed to reduce the negative consequences for both the burned-out anaesthesiologists and their patients. More studies are needed to address in-depth the other sources of chronic stress in anaesthesiologists. They should not only measure competence factors and production pressures, but also the effects of a noisy environment, poorly-designed work spaces, long working hours, night calls, and fatigue. Also valuable would be a measure of the effects of associated problems, like the fear of litigation, low organisational justice, economic uncertainty, and conflicts with co-workers and superiors.

Conclusion

A lack of job support was the main cause of stress and burnout among academic anaesthesiologists, specifically among residents and assistant lecturers who were the the most stressed groups of all of those included in this study. Academic anaesthesiologists are in need of a well-organised institutional strategy to mitigate their heavy academic demands and amend the shortcomings of their job support network. Such a strategy may serve to lessen their experiences of stress and burnout.

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