

Are We Working Too Hard?—A Functional Scoring of Orthopaedic Surgeons

Dear Editor,

It is no secret that surgeons are subjected (or subject themselves) to long hours at work, be it in the operating theatre, the clinic, the office, or otherwise. Such a lifestyle is likely to result in health problems in the long run. The mental health of doctors has been extensively studied, with many doctors revealing evidence of psychiatric morbidity.^{1,2} This has implications on both the health of doctors and healthcare in general, as burnout can be associated with poorer performance and increased turnover rate of healthcare workers.³

For orthopaedic surgeons and trainees especially, it was found that there was a high incidence of reported emotional exhaustion, psychological distress, and burnout.^{4–6} Given the positive correlation with work hours, it is worth exploring whether we face the same problem locally.

There have also been surprisingly few studies on the physical health of surgeons. For orthopaedic surgeons, standing long hours in the operating room, applying manual traction, and hammering nails are all part of the job. Such physical demands are sure to take their toll on their health in ways that could possibly be unique to orthopaedic surgeons.⁷

Materials and Methods

We created an anonymous online survey that consisted mainly of questions from the Short Form-36 (SF-36) health survey questionnaire, a validated tool that covers both physical and mental health;⁸ and the Patient Health Questionnaire-9 (PHQ-9), a validated depression screening questionnaire.⁹ We included questions on hours in surgery, stay-in calls, amount of sleep, and respondent demographics. The survey was disseminated to orthopaedic surgeons and trainees in all public hospitals in Singapore via email. Consent was inferred from completion of the questionnaire.

Ethics approval was obtained from the Institutional Review Board prior to the study.

Results

Of 137 invitations, 67 (48.9%) responses were received. As local norms are not available for SF-36, we compared the scores for the various sections with population norms

from the United States.¹⁰ We found that surgeons were significantly ($P < 0.05$) superior in 2 physical domains but poorer in 2 mental domains.

Comparisons were made between the different subgroups of surgeons, namely: gender, marital status, age, appointment, average number of hours spent in surgery after office hours per week, and average number of stay-in calls per week.

The starkest difference was between different genders: females scored significantly poorer ($P < 0.05$) than males in 7 domains. The next significant difference in scores ($P < 0.05$) was the group that operated 10 or fewer hours after office hours, scoring better than the group that operated 11 or more hours, in 7 domains. “Married” respondents scored significantly better than “single” respondents ($P < 0.05$) in 4 domains, while respondents aged above 40 scored significantly better than those aged 40 and below ($P < 0.05$) in 3 domains, and consultants scored significantly better than trainees ($P < 0.05$) in 2 domains. The significant results ($P < 0.05$) are summarised in Tables 1 and 2.

Stratifying by appointment revealed that trainees who operated 10 or fewer hours after office hours scored significantly better ($P < 0.05$) in 5 domains than those who operated 11 or more hours after office hours. The consultants, as expected, scored significantly better ($P < 0.05$) than both groups of trainees, in the same 5 domains. These scores are reflected in Table 3.

Table 1. Comparison of Scores of Surgeons vs the Norm

Section	Surgeons' Score	Norm	P Value
Physical functioning	91.0	83.3	<0.05
Role physical	79.6	82.5	0.37
Bodily pain	78.2	71.3	<0.05
General health	62.1	70.8	<0.05
Vitality	54.3	58.3	0.10
Social functioning	76.1	84.3	<0.05
Role emotional	84.6	87.4	0.28
Mental health	73.2	75.0	0.39

Table 2. Significant Scores by Demographics

Section	Demographic Parameter								Surgery After Hours	
	Male	Female	Married	Single	Consultant	Trainee	Age ≤40	Age >40	≤10 hours	>10 hours
Physical functioning	91.4	88.3	91.7	88.1	91.7	90.0	90.1	92.9	91.5	88.8
	$P = 0.05$		$P = 0.12$		$P = 0.16$		$P = 0.56$		$P = 0.08$	
Bodily pain	82.5	60.4	82.1	69.2	83.4	74.6	78.0	83.0	84.0	59.4
	$P < 0.05$		$P < 0.05$		$P = 0.13$		$P = 0.35$		$P < 0.05$	
Vitality	80.4	63.7	79.7	71.8	78.5	77.8	76.5	81.8	81.1	64.7
	$P < 0.05$		$P = 0.14$		$P = 0.96$		$P = 0.35$		$P < 0.05$	
Role emotional	64.5	46.3	64.3	52.8	64.4	59.0	59.3	68.3	64.9	49.1
	$P < 0.05$		$P = 0.06$		$P = 0.28$		$P = 0.14$		$P < 0.05$	
Physical functioning	57.4	34.0	57.1	42.8	61.5	44.8	50.4	62.8	58.0	37.5
	$P < 0.05$		$P < 0.05$		$P < 0.05$		$P < 0.05$		$P < 0.05$	
Bodily pain	79.1	56.9	77.5	70.2	78.9	72.4	72.0	85.1	81.6	51.0
	$P < 0.05$		$P = 0.09$		$P = 0.19$		$P < 0.05$		$P < 0.05$	
Vitality	87.1	68.5	86.3	77.6	8.8	79.0	82.8	88.5	88.8	65.2
	$P < 0.05$		$P < 0.05$		$P = 0.07$		$P = 0.33$		$P < 0.05$	
Role emotional	76.6	51.7	77.5	55.9	81.3	62.6	69.0	82.4	76.8	56.7
	$P < 0.05$		$P < 0.05$		$P < 0.05$		$P < 0.05$		$P < 0.05$	

PHQ-9 revealed that 35.4% of surgeons have moderate to severe symptoms of depression. The average score was 12.9, indicating symptoms of minor depression.⁹

A total of 23.9% of surgeons agreed to having contributed to road traffic accidents due to lack of sleep. However, when stratified by the average number of hours spent sleeping per day, the majority of respondents fell into the 5-to-8 hours category, hence we were unable to identify a cutoff point that put doctors at greater risk of road traffic accidents.

Discussion

The good news is the scores of our doctors are not that different from the normal population. In fact, the better

Physical Functioning and Bodily Pain scores show that perhaps orthopaedic surgeons know how to take care of their physical health better than the general population, which may normally be expected of doctors.

After delving deeper into the analyses, we see the darker effects of this industry: overwork causing impaired social functioning, feeling nervous or depressed, and generally poor health. This is especially so when we compare the scores of single doctors and doctors who operated 11 or more hours after office hours per week, against the population norms. These doctors score worse than the general population, especially in the mental health components of SF-36. This may suggest that while younger, single trainees are physically able to cope with the workload their traineeship entails, mental stresses of the job may take their toll. An increased workload has already been shown to be a risk factor for burnout and depression, which in turn leads to increased rates of medical errors.¹¹⁻¹³

Conversely, we note that the more senior groups, i.e. the consultants, older and married surgeons, fared better when compared against the younger trainees. Thus we may postulate that either older surgeons possess more maturity and mental strength to deal with the rigours of orthopaedic surgery, or the responsibilities of a trainee are tougher than those of a consultant, or both. One thing seems certain — things get better with age (and promotion).

The results for PHQ-9 point to a slightly different conclusion: no significant demographic factor can be

Table 3. Significant Scores of Trainees Operating ≤10 Hours, Trainees Operating >10 Hours and Consultants

Section	Trainees Operating ≤10 Hours	Trainees Operating >10 Hours	Consultants
Role physical	83.3	60.2	83.4
Vitality	49.3	37.5	61.5
Social functioning	84.0	53.4	78.9
Role emotional	86.6	66.7	88.8
Mental health	66.9	55.5	81.3

identified to cause depressive symptoms. However, the average score, that suggests symptoms of depression, is also an indication that the toll orthopaedic surgery takes on its doctors is more than just skin (or muscle) deep.

Judging from the SF-36 and PHQ-9 results, it appears that orthopaedic surgery is more mentally than physically demanding, unlike what we thought before. This is perhaps another piece of evidence, to disprove the “twice as strong as an ox, and half as smart” claim.¹⁴

The poor mental health scores indicate that our doctors, especially our trainees, may be at risk of burnout. However, do note that a portion of our trainees are still part of the old specialist training programme, and hence not subjected to the work hour restrictions that the current residency entails. Working conditions may improve once more of our trainees are forced to keep to more humane hours.

Despite the better scores for the male than the female populations, having 9 female respondents (13.4%) greatly reduces the power of comparison. The reason for a small female surgeon population has previously been explored,¹⁵ with factors such as lifestyle being reasons for women not choosing surgical specialties. However, other reasons, such as its physical nature, may be misconceptions. Our results would perhaps have addressed these misconceptions, but the low population of female respondents prevents us from drawing any conclusions.

Conclusion

The key to happiness seems to be growing old, getting married, and becoming a consultant surgeon as soon as possible. In the meantime, we recommend juniors to avoid operating more than 10 hours after office hours, as this directly affects their health-related quality of life and risk of depression. While drastically improved working conditions may not seem possible at the moment, we hope this study can spur decision-makers to continue to make policy changes, and for further studies to be conducted on the well-being of doctors.

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