

THE OCCUPATIONAL FATIGUE IN ANESTHESIOLOGISTS: ILLUSION OR REAL?

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Abstract

Background: Fatigue is usually reported after lack of sleep or excessive physical or mental effort. Endocrine disorders are also associated with the symptoms of fatigue. Symptoms of fatigue were reported 20% of working population. Anesthesiologists are more exposed to stress at work because of long working hours and high demand of the job. The aim of this study was to evaluate fatigue at work from anesthesiologist' own perspectives and to identify the possible risk factors associated with fatigue.

Methods: Two hundred and ten persons, were participated in this survey, they were 50 anesthesiologists, 60 diabetic patients and 100 employees. Participants were asked to answer two self report Questionnaires: The Multidimensional Fatigue Inventory (MFI-20) and General Health Questionnaire (GHQ-12) which used to assess the degree of fatigue and mental health respectively.

Results: Total fatigue score was significant in anesthesiologists compared to both patients (P value = 0.047) and employees (P value < 0.001). All sub-items of fatigue score were higher in anesthesiologists compared to those of employees (P value < 0.001), however only general and mental fatigue were higher in comparison to patients (P value = 0.02). The GHQ score of the anesthesiologists was significantly higher when compared to those of the employees (P value < 0.001) but no difference with patients (P value = 0.090). Physical, mental and total score of fatigue were higher in female anesthesiologist.

Conclusion: fatigue and psychological distress are common among anesthesiologists in comparison to patients and ordinary hospital employees. Female anesthesiologists were affected more by fatigue.

Keywords: fatigue, anesthesia, psychological distress.

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Introduction

Fatigue is an everyday experience that individuals report after inadequate rest or sleep, after exertion physical power, after mental effort or when they lack motivation to initiate activities¹. Many endocrine disorders, such as diabetes, are associated with the symptoms of fatigue². Previous survey on the working population reported 22% incidence of fatigue symptoms³. Persistent fatigue is strongly associated with functional status and can lead to absenteeism and work disability⁴.

Anesthesiology is a stressful occupation⁵ due to the long working hours, demanding interpersonal relations, need for sustained vigilance, fear of litigation, competence, unpredictability of work and production pressure⁶. Long-work-hours including night duties with limited and/or interrupted sleep has been reported to be common in anesthesiologist⁷. Chronic stress and fatigue favor the development of exhaustion with professional dissatisfaction and poor work-performance⁸. Willful efforts to remain awake and alert when one are sleep-deprived and fatigued is highly stressful and frequently unsuccessful in the face of such a potent basic pathophysiological onslaught¹. Some indirect evidence link fatigue with impaired medical decision making and reduced patient safety⁹.

Because of its high prevalence and increasingly acknowledged negative effect on the patient's well being, fatigue has become an important research variable. Besides being investigated as a symptom or side effect, it has also been studied as a precursor of disease¹⁰.

The main objective of this study was to explore and understand the phenomenon of fatigue rather than testing a hypothesis. It was important to evaluate fatigue at work from anesthesiologist' own perspectives and its association with psychological distress, comparing them with fatigue samples of employees and diabetic patients. Identification of possible risk factors underlying fatigue, were also observed.

Materials and Methods

With the approval of the local Research Committee, a total of 210 persons, aged 20-50 years participated in this survey. They received two

questionnaires, MF1-20 and GHQ-12, with a covering letter explaining the purpose and the general outline of the study, describing how the data would be used, and guaranteeing anonymity of responses. The voluntary nature of participation was emphasized. Written consent was obtained from all participants.

The target group was fifty anesthesiologists (33 males, 17 females, 10% married) working in the same hospital and subjected to high workload, stress, and irregular sleep. The second group comprised 60 diabetic patients (adisease known to induce fatigue) followed up in the outpatient clinic. The last group comprised one hundred employees with wide range of work profile with no nightshift.

Persons with substance abuse, smoking, neurological or psychiatric disorders and very obese persons, were excluded from the study because of the known association between these factors and fatigue⁶. Illiterate persons were also excluded because questionnaires used in this study are self report instruments. It took each participant approximately 20 minutes to fill out all the required informations.

The Questionnaires

*The Multidimensional Fatigue Inventory (MFI-20)*¹¹ is a multidimensional self report instrument designed to measure five aspects of fatigue: general, physical, reduced motivation, reduced activity and mental fatigue. The sum score of the responses (0, 1, 2, 3 or 4) is designated as total fatigue (TF) ranging from 0 to 80. Each subscale contains 4 items for each dimension. It is a 5 point scale ranging from agreement (yes) to disagreement (no). Higher scores mean a higher degree of fatigue, more concentration problems, reduced motivation, or low level of activity. It is short, does not contain any somatic items, and is designed to provide a complete description of the fatigue experience. It was extensively tested in clinical setting and validated in different population. Subjects are instructed to indicate how they felt in the last month.

General Health Questionnaire: (GHQ-12) by Goldberg, was used in the present work to assess different aspects of mental health of the participants¹². The most important reasons for using the GHQ are brevity, intelligibility, and psychometric properties¹³.

Reliability coefficients for GHQ ranged from 0.78-0.95¹³. The GHQ used in this study includes 12 items. Each item has the following 4 answer choices: not at all, no more than usual, more than usual, and much more than usual. This questionnaire has been used as a self-report screening instrument for detecting minor psychiatric disorders in the general population. The traditional scoring method (0, 0, 1, 1) is designed to identify individuals reporting psychological distress to be classified as probable cases of minor psychiatric disorders. Given a possible range of scores ranging from 0 to 12, the threshold for cases classification used in the present study was four or higher. This means that all those participants scoring four or more on the GHQ were considered to have mental problems and therefore may need health care³. The present work used the improved scoring system¹⁴, in which, for the “negative” items only, three responses categories (rather than two) are scored as indicating illness. It appears to represent a useful improvement over the conventional scoring, since it provides a wide range among items in the proportion of “ill” responses.

Statistical Analysis

The results were analyzed using SPSS version 14 (SPSS Inc., Chicago, IL, USA). Statistical analysis was done using independent sample, two tailed t-test or one-way analysis of variance (ANOVA) whatever

appropriate. If ANOVA Test was significant, Tukey HSD Multiple Comparisons Test was used to compare different groups. Correlation between groups was done using Pearson Correlation Coefficient. For all tests of significance, a *P* value of 0.05 was used as the level of significance. Numerical data were expressed as a mean value and standard deviation (SD) while categorical data were expressed as numbers and percentages.

Results

The sociodemographic characteristics are shown in Table 1.

Total score of fatigue was statistically significant in anesthesiologists when compared to scores of both diabetic patients (*P* = 0.047) and employees (*P* < 0.001) (Fig. 1).

Fig. 1
Total Fatigue Score Questionnaire Data expressed as a mean value while error bars represent (SD),

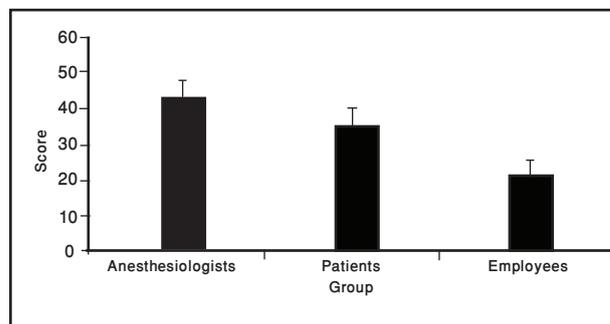


Table 1
Demographic data

		Anesthesiologists (n = 50)	Patients (n = 60)	Employee (n = 100)
Age: (years)				
20-30		10 (20%)	7 (11.7%)	46 (46%)
31-40		21(42%)	14 (23.3%)	34 (34%)
41-50		19 (38%)	39 (65%)	20 (20%)
Sex	Male	33 (66%)	31 (51.7%)	58 (58%)
	Female	17(34%)	29 (48.3%)	42 (42%)
Marital status				
Married		35 (70%)	38 (63.3%)	60 (60%)
Unmarried		15 (30%)	22 (36.7%)	40 (40%)
Education				
< 12 years		0 (0%)	25 (41.7%)	26 (26%)
12-14 years		0 (0%)	11 (18.3%)	7 (7%)
University		6 (12%)	17(28.3%)	50 (50%)
Postgraduate		44 (88%)	7 (11.7%)	17 (17%)

Data expressed as number and percentage. Unmarried = single, divorce or widow.

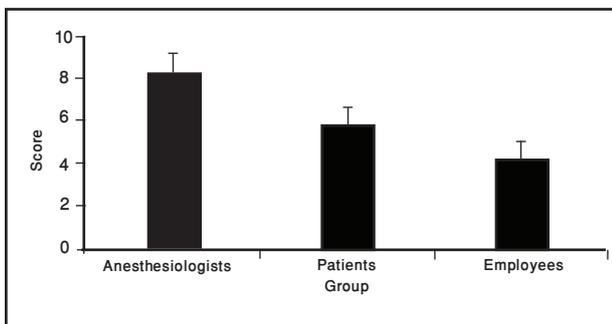
Table 2
Score of Sub-items of fatigue Questionnaire

	Anesthesiologists (n = 50)	Patients (n = 60)	Employee (n = 100)
Fatigue Questionnaire			
General fatigue	10.0 (5.0)	8.0 (4.7)*	5.4 (2.5)*
Physical fatigue	9.2 (5.2)	8.1 (4.6)	4.8 (3.0)*
Reduced activity	7.3 (4.7)	6.1 (4.0)	2.8 (2.4)*
Reduced Motivation	5.9 (4.3)	4.8 (3.4)	2.9 (2.5)*
Mental fatigue	9.6 (5.2)	7.5 (4.6)*	4.8 (2.4)*

Data expressed as a mean value (SD), * P < 0.05 versus anesthesiologists.

High degree of fatigue was reported in 78% of anesthesiologists, 73.3% of diabetic patients and 53% of the employees. Subitems scores are presented in Table 2, which show that anesthetic group scored significantly higher on all subscales.

Fig. 2
General Health Score Questionnaire Data expressed as a mean value while error bars represent (SD)



Only general and mental fatigue scores were higher in the anesthetic group in comparison to patients' scores. (P = 0.02).

The GHQ-12 score of the anesthesiologist group was higher (statistically significant) when compared to that of employees (P < 0.001) and with no statistical difference with scores of diabetic patients (P = 0.090) (Fig. 2). Psychiatric distress (as judged by total score on GHQ \geq 4) was experienced by 84% of the anesthesiologist, in comparison to 78.3% of diabetic patients and 54% of the employees.

The impact of fatigue on gender (Table 3) revealed that physical, mental and total score of fatigue were higher in female anesthesiologist (P = 0.002, 0.003 & 0.006 respectively). Male employees showed significant physical, reduced motivation and overall fatigue than scores of women

Table 3
Fatigue comparisons between male and female within the three groups

	Anesthesiologists (n = 50)	Diabetic Patients (n = 60)	Employee (n = 100)
General fatigue			
Male	8.8 (5.3)	7.9 (4.8)	5.7 (2.7)
Female	12.3 (3.5)	8.1 (4.6)	5.1 (2.3)
Physical fatigue			
Male	7.7 (5.4)	7.4 (4.6)	5.9 (2.6)†
Female	12.0 (3.5)†	8.7 (4.5)	3.2 (2.8)
Reduced activity			
Male	6.2 (4.8)	6.1 (4.1)	3.3 (2.4)
Female	9.2 (4.0)	6.2 (4.0)	2.2 (2.4)
Reduced Motivation			
Male	5.0 (4.2)	3.8 (3.0)	3.5 (2.7)†
Female	7.5 (4.0)	5.9 (3.5)	2.8 (2.1)
Mental fatigue			
Male	8.1 (5.2)	7.3 (4.8)	4.4 (2.4)
Female	12.4 (4.2)†	7.8 (4.5)	5.2 (2.3)
Total score			
Male	36.4 (23.3)	32.7 (19.7)	23.7 (8.6)*
Female	53.6 (17.6)†	36.9 (19.5)	18.0 (8.4)

Data expressed as a mean value (SD), * P value < 0.05, † P value < 0.01.

($P = 0.033, 0.008$ & 0.005 respectively). No statistical significant differences were observed between women and men suffering from diabetes in all dimensions of fatigue.

Correlation between total fatigue score MF1-20 and GHQ¹² was strongly positive in anesthesiologist only ($r = 0.93$ & $P = 0.01$). In the employees, moderate positive correlation between marital status and total fatigue score was found ($r = 0.37$ & $P = 0.01$). There was no evident correlation between age and fatigue.

Discussion

The present study showed that fatigue in anesthesiologists was significantly high when compared to that of diabetic patients and employees: The GHQ¹² score was significantly high when compared to that of the employees but not to that of diabetic patients. Physical, mental and total score of fatigue were higher in female anesthesiologists. Correlation between total fatigue score and GHQ was strong positive only in anesthesiologists, the employees showed moderate positive correlation between marital status and total fatigue score.

Studies on fatigue showed that the prevalence rates varied widely depending on the surveyed population. It was reported to be 22% in working³ and general Norwegian population¹⁵, and 38% in a UK community survey¹⁶. Our study proved that chronically-ill patients perceived more fatigue than healthy employees.

King and colleagues attributed the fatigue in diabetic subjects to the occurrence of hypoglycemia at night which could not be explained by the biochemical parameters¹⁷. Consistent with our results, Huibers et al, found the point prevalence of severe fatigue (59% to 63%) among employees and its course characterized by remission and relapse in time¹⁸. It had been reported that disturbed sleep and fatigue are much prevalent in shift workers thus giving the former good reasons for quitting the shift work¹⁹.

Parker proved that the reduction in physician performance and vigilance resulted from fatigue and sleep loss²⁰. Muller et al observed that occupational fatigue significantly increased at the end of night shift²¹. On the other hand, Kinzl et al found that 12.4% of the studied anesthesiologists reported feeling fatigue²².

This difference could be attributed to a difference in methodology in use, sample size and culture.

The participants who had scored above the cut-off point (≥ 4) on GHQ were more likely to suffer from a mental disorder. Psychiatric distress was experienced by 84% of the anesthetics, 78.3% of the patients and 54% of the employees. Previous studies showed a range between 22 and 46% of the respondents of the UK hospital specialists' exhibit clinically important level of psychiatric morbidity²³. This difference could be attributed to different cut-off point used.

A strong positive correlation between fatigue and psychological distress was observed only in the studied anesthesiologists. Previous studies have shown that fatigue is associated with psychological distress in a way that varies across different populations^{3,16}. Thomas found that in residents, the higher the depression scores the more progressive anger and fatigue²⁴. Bültmann et al found 57% of the studied employees reporting both fatigue and psychological distress at the same time while 6% reporting fatigue only without psychological distress³.

Gender influence showed that female anesthesiologists suffered from fatigue more than male anesthesiologists while the opposite was reported in the employees. This could be explained by traditional responsibilities of women towards home duties and children. This is consistent with Hardy et al who attributed this difference to reduced physical fitness, reproductive or combined occupational and domestic responsibilities²⁵. On the contrary, previous studies found fatigue more among female employees^{4,15,16}. However, Bültmann and colleagues found fatigue score to be highly similar in men and women employees. These differences in the results could be attributed to different conceptualization and operationalization of fatigue and psychological distress³.

Only the employees showed moderate positive correlation between marital status and fatigue in the current study. Previous work observed that in both genders, employees who reported living alone had significant higher fatigue scores²⁵. Parker et al proved that high level of marital disharmony was found among physicians particularly anesthetists and attributed on fatigue²⁰. Others showed no or minor effects of marital status on fatigue^{15,25}.

Conclusion

The present study showed that fatigue was more represented in the anesthesiologists group compared to other studied groups. It showed strong positive association with psychological distress. Gender, more than age or marital status, seems to affect fatigue in the anesthesiologists.

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