

High Level of Burnout in Intensivists

Prevalence and Associated Factors

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Rationale: Professional burnout is a psychological syndrome arising in response to chronic interpersonal stressors on the job. There is the perception that intensivists are particularly exposed to stress because lives are literally in their hands.

Objective: To evaluate the prevalence and associated factors (patients or organization) of burnout among physicians working in intensive care units (ICUs) (including interns, residents, fellows, and attending physicians).

Methods: A 1-day national survey was conducted in adult ICUs in French public hospitals.

Measurements: The level of burnout was evaluated on the basis of the Maslach Burnout Inventory (MBI).

Main Results: A total of 189 ICUs participated and 978 surveys were returned (82.3% response rate). A high level of burnout was identified in 46.5% of the respondents. Ordinal logistic regression showed that female sex (odds ratio, 1.58; 95% confidence interval, 1.09 to 2.30) was independently associated with a higher MBI score. Whereas no factor related to the severity of illness of patients was retained by the model, organizational factors were strongly associated with a higher MBI score. Workload (the number of night shifts per month, a long period of time from the last nonworking week, night shift the day before the survey) and impaired relationships (such as conflict with another colleague intensivist, and/or with a nurse) were the variables independently associated with a higher MBI score. In contrast, the quality of the relationships with chief nurses and nurses was associated with a lower MBI score.

Conclusions: Approximately one-half of the intensivists presented a high level of burnout. Organizational factors, but not factors related to the patients, appeared to be associated with burnout.

Keywords: intensive care unit; organizational management; conflict

Burnout has been described by Maslach and coworkers (1) as a condition in which professionals “lose all concern, all emotional feeling for the people they work with, and come to treat them in a detached or even dehumanized way.” Professional burnout is a psychological syndrome arising in response to chronic interpersonal stressors on the job (2). Burnout is a problem that is specific to the work context, in contrast to depression, which tends to pervade every domain of a person’s life (2). Physical illness, emotional problems, increased turnover, absenteeism (2), and poor job performance and negative attitudes in general (3) are some of the problems on a long list of difficulties that have

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AT A GLANCE COMMENTARY

Scientific Knowledge on the Subject

Little is known about burnout in intensivists (including both juniors and seniors). Associated factors have not been identified.

What This Study Adds to the Field

The present study suggests that a high level of burnout is present in about 50% of intensivists. Organizational factors, but not factors related to patients, appear to be associated with burnout.

been associated with burnout. Moreover, burnout could affect the quality of patient care (4, 5).

Burnout appears to be common among practicing physicians, with rates ranging from 25 to 60% (6, 7). There is a common perception that intensivists are particularly exposed to stress because lives are literally in their hands. To our knowledge, only one study (8) has evaluated the prevalence of burnout in internal medicine intensivists (attending physicians). Coomber and coworkers (9) reported that approximately one-third of U.K. intensive care unit (ICU) doctors appeared distressed and 10% reported depressive symptoms. Most of the attention has been focused on junior doctors and their long working hours. However, there have also been reports of distress among senior hospital doctors (10, 11). Because these factors are closely linked and because few studies have previously examined this syndrome in the intensive care environment, we performed this study to assess burnout among all intensivists (interns, residents, fellows, and attending physicians). We hypothesized the following: (1) there is a high rate of burnout among intensivists; (2) burnout in intensivists could be associated with the severity of illness of patients; and (3) burnout in intensivists may be associated with organizational factors such as workload and relationships with colleagues. Some of the results of these studies have been previously reported in the form of an abstract (12).

METHODS

Data Collection

All directors of French adult ICUs (public hospitals) were contacted by letter in January 2004 and asked to participate in the study. Nonresponding ICU directors received an additional letter in February 2004. In the agreement form, ICU directors had to indicate whether they accepted participation in the study and were asked to give the number of physicians working in their ICU.

Survey Instrument

Each participating ICU received two types of documents validated by the members of the study board (N.E., E.A., K.B., N.K., F.P., A.L.,

and L.P.). The first was to be filled in by the director of the unit and aimed to describe the intensive care setting: information about the ICU (teaching hospital or not, type, number of beds), activity in 2003 (number of admissions, duration of stay, Simplified Acute Physiology Score II [SAPS II] score on admission, and mortality rate), number of physicians and their status (attending physicians, fellows, interns, or residents), and patient-to-nurse ratio. Other information was required: number of nurses and physicians who were on sick leave for more than 1 week in 2003. Finally, ICU directors were asked to point out whether there was a discussion group and/or a psychologist in their unit.

The second document was a self-administered questionnaire for each physician working in the ICU. A covering letter outlining the purpose of the study along with a three-page questionnaire was sent to each participant. The covering letter stated that the purpose of the study was to better understand the feelings of intensivists. The letter also explained that the responses would be anonymous. The questionnaire was divided into four parts. Part 1 included basic demographic data (age, sex, marital status, number of children, religion, and time to reach their hospital), data concerning their professional activity, some questions about experiences during the past week (number of night shifts; number of their patients who died; number of decisions on withholding/withdrawing; and conflict with other intensivists, ICU nurses, or patients' families), and five questions about their situation the day of the survey: number of patients under his or her responsibility, night shift before the survey, off the day before the survey, probable death of a patient, decision on withholding/withdrawing. Two more questions were about the number of conflicts with nurses and other intensivists in 2003. Intensivists were also asked to rate their relationships with nurses, chief nurses, non-ICU physicians, and hospital management on a scale of 0 to 10. Intensivists were asked about their workload (mean number of work hours per week during the previous 6 mo, mean number of night shifts per month the previous 6 mo, time elapsed since their last week of holidays/last weekend off/last day off).

Part 2 consisted of the Maslach Burnout Inventory (MBI). The MBI is a 22-item questionnaire that has been shown to be reproducible and valid (1, 2). The inventory asks respondents to indicate on a seven-point Likert scale (which does not include the word "burnout") the frequency with which they experience certain feelings related to their work during the last week preceding the day of the survey. The MBI evaluates three domains of burnout. The emotional exhaustion subscale (nine items) assesses feelings of being emotionally overextended and exhausted by one's work. The depersonalization subscale (five items) measures an unfeeling and impersonal response toward recipients of one's service, care, or treatment. The personal accomplishment subscale (eight items) assesses feelings of competence and successful achievement in one's work with people. For our study, we defined burnout as a high MBI score. For the French population, a high level of burnout is defined by an MBI score of -8 to $+34$, a moderate level is defined by a score from -21 to -9 , and a low level of burnout is indicated by an MBI score of -45 to -22 (13).

Part 3 consisted of the Centers of Epidemiologic Studies Depression Scale (CES-D) (14).

Part 4 of the survey, consisting of seven questions regarding the private lives of intensivists, used a four-point categorical scale, as for the CES-D, from never to frequently.

Statistical Analysis

All statistics were performed with SPSS 13.0 software (SPSS, Inc., Chicago, IL). Data are expressed as means \pm SD or as median with interquartile range (IQR) according to the distribution of the data. One-way analysis of variance or the Wilcoxon signed-rank test (according to the distribution of the data) was performed to compare continuous variables. A model of ordinal logistic regression was constructed according to the methodology described by McCullagh and Nelder (15). All variables with a *p* value less than 0.20 were entered in the model. A *p* value less than 0.05 indicated significance.

RESULTS

A total of 189 of the 318 (59.4%) French ICU directors agreed to participate (Figure 1). A total of 1,189 surveys (with a return

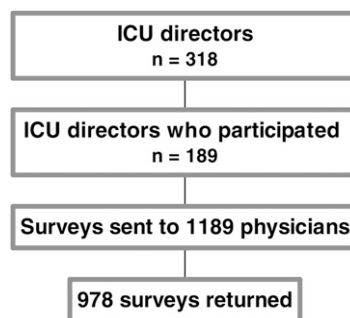


Figure 1. Study design.

envelope addressed to the researchers) were sent on March 6, 2004, and the survey took place on March 25, 2004. A total of 978 surveys were returned (82.3% response rate).

Characteristics

Tables 1 and 2 summarize the characteristics of the ICUs and of the respondents. Attending physicians constituted 62% of the sample with the remainder (38%) being residents, interns, or fellows. The majority of intensivists (54%) worked in teaching hospitals. The mean age was 40 ± 10 years and 72% of the respondents were male.

Prevalence of Burnout and Associated Symptoms

Using the MBI, a high level of burnout was identified in 46.5% of the respondents. As for the remaining respondents, 23.3% of them presented a low level of burnout and 30.2% indicated a moderate level of burnout. Depersonalization (for medical professionals, a score of 10 or more is considered high, indicating burnout) was observed in 37% of the responding intensivists. A high level of emotional exhaustion (a score of 27 or more is considered high) was present in 19% of the respondents. A low level of personal accomplishment (this subscale has an inverse relationship to burnout, and a score of 33 or less is considered low) was found in 39% of the 978 intensivists who responded to the survey (1). Figure 2 presents the three MBI subscales according to the level of burnout. Intensivists presenting a high level of burnout exhibited higher emotional exhaustion and depersonalization scores associated with the lower personal accomplishment score.

In all, 39.5% of the respondents wanted to leave their jobs. This percentage was higher (51.4%) for the intensivists exhibiting a high level of burnout (Figure 3). When the CES-D score was considered, symptoms of depression were identified in 24%

TABLE 1. CHARACTERISTICS OF THE 189 PARTICIPATING INTENSIVE CARE UNITS

Characteristic	Value*
Annual number of admissions to the ICU [†]	600 \pm 310
Mean duration of hospitalization in the ICU, d [†]	7.9 \pm 2.6
SAPS II score on admission [†]	39 \pm 5
ICU mortality, % [†]	19.3 \pm 5.5
Staffing (patients per nurse), n	3.0 \pm 0.6
Number of physicians in charge of the ICU	3.6 \pm 2.2
Number of interns or residents per ICU	2.7 \pm 2.0
Number of ICU beds the day of the survey	14 \pm 7

Definition of abbreviations: ICU = intensive care unit; SAPS II = Simplified Acute Physiology Score II.

* Values are expressed as means \pm SD.

[†] Year 2003.

TABLE 2. CHARACTERISTICS OF PARTICIPANTS

Characteristic	Value
Number	978
Age, yr (mean ± SD)	40 ± 10
Women, %	28
Married or with a partner, %	70
Number of children, mean ± SD	1.27 ± 1.0
At least one child, %	58
Practicing a religion, %	34
Traveling time to work, min (mean ± SD)	23.0 ± 18.0
Status	
Interns/residents, %	24
Fellows, %	14
Attending physicians, %	62
Type of ICU	
Medico-surgical, %	58
Medical, %	31
Surgical, %	8
Other (specialized), %	3
Working hours per week, h (mean ± SD)	59 ± 12
ICU practice, mo [median (IQR)]	60 (11–180)
Full-time ICU activity, %	69
Night shifts per month, mean ± SD	4.8 ± 2.0
Compensation for overtime, %	34
Relief from service until the next working day after a night shift, %	44
During the last 7 d	
Death of one of your patients, %	68
Withholding decided on your own, %	16
Withholding decided by the team, %	69
Night shift, %	
0 d	15
1 d	36
2 d	36
≥ 3 d	13
The day of the survey	
Night shift before the survey, %	17
Off the day before, %	18
Number of patients under your responsibility, mean ± SD	7.5 ± 5.0
Withholding/withdrawing, %	27
Probable death of one of your patients, %	46
Period since the last nonworking day, d [median (IQR)]	4 (3–6)
Period since the last nonworking week, d [median (IQR)]	40 (20–90)

Definition of abbreviations: ICU = intensive care unit; IQR = interquartile range.

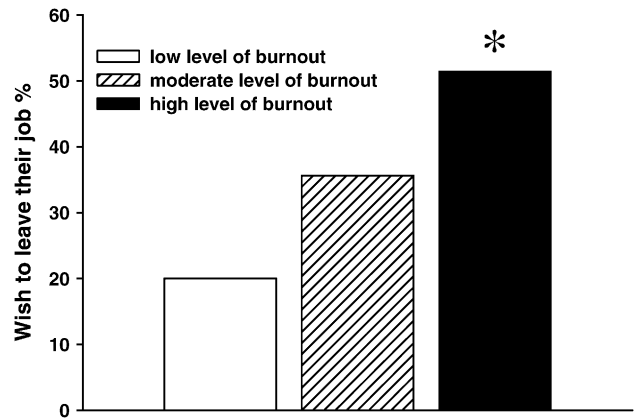


Figure 3. Wish to leave the job and burnout. Values are expressed as a percentage of the total. *p ≤ 0.001 (high level of burnout vs. low and moderate).

of the intensivists and 80.6% of the intensivists exhibiting symptoms of depression presented a high level of burnout. Higher levels of burnout were associated with a poor quality of private life (see Figure E1 in the online supplement).

Risk Factors for Burnout: Univariate Analysis

Demographics. (For a summary of demographic factors associated with burnout, see Table 3.) Female intensivists reported a higher level of burnout than did male intensivists. Young intensivists having less ICU practice presented a higher level of burnout. Respondents who reported a higher level of burnout were less frequently married or partnered and more often did not have children.

Severity of illness of patients. (For a summary of factors associated with the severity of illness of patients and their relationship to burnout, see Table 3.) SAPS II score, mortality rate, patient deaths, and decision to withhold or withdraw treatment during the week preceding the survey had no impact on burnout (Table 3). A decision to withhold or withdraw treatment the day of the survey was the sole factor associated with a higher level of burnout.

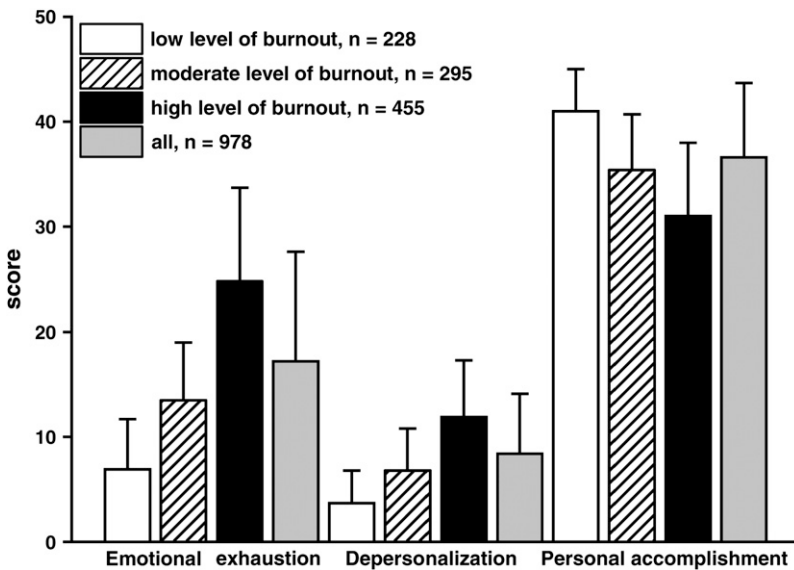


Figure 2. Maslach Burnout Inventory (MBI) subscales.

TABLE 3. BURNOUT AND DEMOGRAPHICS AND FACTORS ASSOCIATED WITH THE SEVERITY OF ILLNESS OF PATIENTS

	High Level of Burnout (n = 455)	Moderate Level of Burnout (n = 295)	Low Level of Burnout (n = 228)	p Value
Age, yr (mean ± SD)	38 ± 10	39 ± 10	42 ± 10	0.001
Women, %	31	29	21	0.02
Married or with a partner, %	66	74	74	0.047
Number of children, %				0.002
0	48	38	35	
≥ 1	52	62	65	
Practicing a religion, %	37	34	32	0.39
Traveling time to work, min (mean ± SD)	23 ± 17	24 ± 21	21 ± 16	0.16
Status				0.001
Interns/residents, %	44	39	26	
Fellows, %	42	45	53	
Attending physicians, %	14	16	21	
ICU practice, mo [median (IQR)]	48 (6–144)	60 (10–168)	104 (23–228)	0.001
ICU mortality (Year 2003), % (mean ± SD)	19.3 ± 5.7	19.3 ± 5.6	19.3 ± 5.8	0.99
SAPS II score (Year 2003), mean ± SD	40 ± 5	39 ± 6	40 ± 5	0.45
During the last 7 d				
Death of one of your patients, %	68	68	69	0.22
Withholding decided of your own, %	12	10	9	0.5
Withholding decided by the team, %	69	66	68	0.5
The day of the survey				
Withholding/withdrawing, %	30	20	31	0.008
Probable death of one of your patients, %	47	43	47	0.56

Definition of abbreviations: ICU = intensive care unit; IQR = interquartile range; SAPS II = new Simplified Acute Physiology Score.

Organizational factors. (For a summary of organizational factors associated with burnout, see Table 4 and Figure 4.) Workload was associated with the degree of burnout (working hours per week, number of night shifts per month, compensation for overtime, delay from the last nonworking day or week).

Relationships were related to burnout. Indeed, higher levels of burnout were associated with conflicts with nurses, colleagues, or patients' families during the previous 7 days. The number of conflicts with both nurses and other intensivists was also related to the level of burnout. Finally, relationships with nurses, chief nurses, employers or non-ICU physicians were worse for ICU physicians experiencing a high level of burnout (Figure 4).

Risk Factors for Burnout: Multivariate Analysis

We performed a multivariate analysis to evaluate the independent relationship between burnout and all factors with a p value < 0.20 by univariate analysis. Ordinal logistic regression (Table 5) showed that female sex was independently associated with a higher MBI score whereas no factor related to the severity of illness of patients was retained by the model. Organizational factors were, in contrast, strongly associated with a higher MBI score. Workload (the number of night shifts per month, a long period of time from the last nonworking week, and night shift before the survey) and impaired relationships such as conflict with another colleague intensivist and conflict with a nurse were independently associated with a higher MBI score. In contrast, the quality of the relationships with chief nurses and nurses was associated with a lower MBI score (protective effect). Independent risk factors associated with burnout were also analyzed according to the status of the respondents (see the online supplement).

DISCUSSION

Burnout appears to be common among practicing physicians, with rates ranging from 25 to 60% (6, 7, 16–19). In a study concerning 253 members the Section of Internal Medicine of

the Society of Critical Care Medicine, when MBI subscales were considered, Guntupalli and Fromm (8) found that the emotional exhaustion subscale score was 22.2 ± 9.5 , the depersonalization score was 7.1 ± 5.1 , and the personal accomplishment score was 30.9 ± 6.4 . Whereas depersonalization was similar, personal accomplishment (36.6 ± 7.1) was higher and emotional exhaustion (17.2 ± 10.4) was lower in the present study. In a French study concerning 306 general practitioners, the emotional exhaustion subscale score was 21.9 ± 12.4 , the depersonalization score was 9.1 ± 6.7 , and the personal achievement score was 38.7 ± 7.1 (20). A high level of emotional exhaustion was found in 26% of the responders (19% in the present study) and a high level of depersonalization was noted in 34% (37% in the present study) (20). Finally, the major difference from this latter study performed in general practitioners was the low level of personal accomplishment, which was much more frequently identified in the present study (19 vs. 39%, respectively). However, the total MBI score was not provided in the study done by Cathebras and coworkers (20).

Caring for acutely ill patients may lead to the burnout syndrome. In our study, patient characteristics (SAPS II score, mortality rate, and decision to withhold or withdraw treatment) were not associated independently with a higher level of burnout. In contrast with the study by Baldwin and coworkers (21), we did not find a correlation between the mortality rate among patients and the degree of burnout.

Among the demographic factors, only female sex was retained by the model. A U.S. representative random stratified sample of nearly 6,000 physicians in primary and nonsurgical care showed that female physicians were 60% more likely than male physicians to report signs or symptoms of burnout. This is in agreement with the findings of the present study. Contrary to expectation, none of the 15 studies on residents reviewed by Thomas (22) has demonstrated a higher risk or differential effect of burnout for women. However, only 4 of the 15 studies reported burnout by sex. In the present study, we did not find an association

TABLE 4. BURNOUT AND ORGANIZATIONAL FACTORS

	High Level of Burnout (n = 455)	Moderate Level of Burnout (n = 295)	Low Level of Burnout (n = 228)	p Value
Unit Factors				
Teaching hospital, %	55	48	49	0.049
Type of ICU				0.89
Medico-surgical, %	56	60	60	
Medical, %	33	30	30	
Surgical, %	8	7	8	
Specialized, %	3	2	2	
Number of ICU beds*	15.6 ± 8.8	14.6 ± 6.7	15.5 ± 9.4	0.31
Patients admitted (Year 2003), n*	612 ± 317	597 ± 307	606 ± 313	0.84
Nurse absenteeism (Year 2003), number per ICU†	8 (4–13)	7 (3–11)	7 (3–12)	0.15
Intensivist absenteeism (Year 2003), %				0.8
0 Intensivist	64	67	73	
1 Intensivist	28	27	23	
2 Intensivists	8	5	4	
Discussion group, %	39	44	42	0.4
Psychologist, %	24	26	20	0.35
Intensivist Factors				
Working hours per week, h*	60 ± 12	57 ± 11	58 ± 12	0.003
Full-time ICU activity, %	68	70	72	0.69
Night shifts per month, n*	5.0 ± 2.0	4.7 ± 2.0	4.6 ± 2.0	0.01
Compensation for overtime, %	28	36	41	0.001
Relief from service until the next working day after a night shift, %	40	49	46	0.09
Period since the last nonworking day, d [†]	4 (3–7)	4 (2–5)	4 (3–6)	0.015
Period since the last nonworking week, d [†]	42 (20–90)	35 (17–89)	30 (21–85)	0.004
During Year 2003				
Number of conflicts with a nurse [†]	2 (1–5)	2 (0–3)	1 (0–3)	0.001
Number of conflicts with a colleague intensivist*	5.9 ± 2.7	5.1 ± 2.8	3.9 ± 5.9	0.001
During the last 7 d				
Night shift, %				0.002
0 d	11	21	17	
1 d	36	32	39	
2 d	37	39	31	
≥ 3 d	16	8	13	
Conflict with a nurse, %	18	11	6	0.001
Conflict with a colleague intensivist, %	21	15	8	0.001
Conflict with a patient's family, %	11	7	5	0.03
The day of the survey				
Night shift before the survey, %	19	16	12	0.08
Off the day before, %	16	22	17	0.09
Patient-to-intensivist ratio*	7.4 ± 4.6	7.3 ± 4.8	7.9 ± 5.3	0.34

Definition of abbreviation: ICU = intensive care unit.

* Mean ± SD.

† Median (interquartile range).

with age, work experience, marital status, number of children, or other personal factors. It is important to point out that French residents and interns undergo training in ICUs during contiguous 6-month periods. The day of the survey (March 25, 2004), they had been working in the same ICU since November 1, 2003. It is possible that older intensivists had stopped working in an ICU because of a high level of burnout and did not participate in the survey.

We found that overall workload is associated with higher MBI scores, except when only attending physicians were considered (see the online supplement). For Maslach and colleagues (2), burnout is a response to overload. Generally, workload is related to the emotional exhaustion dimension. In the present study, the multivariate analysis identified three factors for burnout: the number of night shifts per month, a long period of time from the last nonworking week, and performance of a night shift before the survey. In contrast, the number of working hours per week was not retained by the model. For Gopal and colleagues, reducing hours may be the first step to reduce resident burnout (23).

The present study showed that conflicts with coworkers (with another intensivist or nurses) were associated with the higher level of burnout. In contrast, the quality of the relationships with nurses and chief nurses was also associated with a lower degree of burnout. For Stehle (24), many of the stressors identified concerned working relationships between nurses and doctors. For young Swiss physicians (residents and chief residents), the most important job expectations were good relationships with colleagues (25).

One of the limitations of the present study is that although some variables were collected at the level of the ICU (e.g., SAPS II score and mortality rate), we did not use an analytic approach that incorporated a clustered study design. Our aim was to focus on the individuals (doctors) rather than on the ICUs themselves. Finally, no factor obtained at the level of the ICU was retained by the univariate analysis to be entered in the model when multivariate analysis was performed. Another limitation is that we performed an observational study, which cannot determine a causal relationship between some of the variables. Concerning

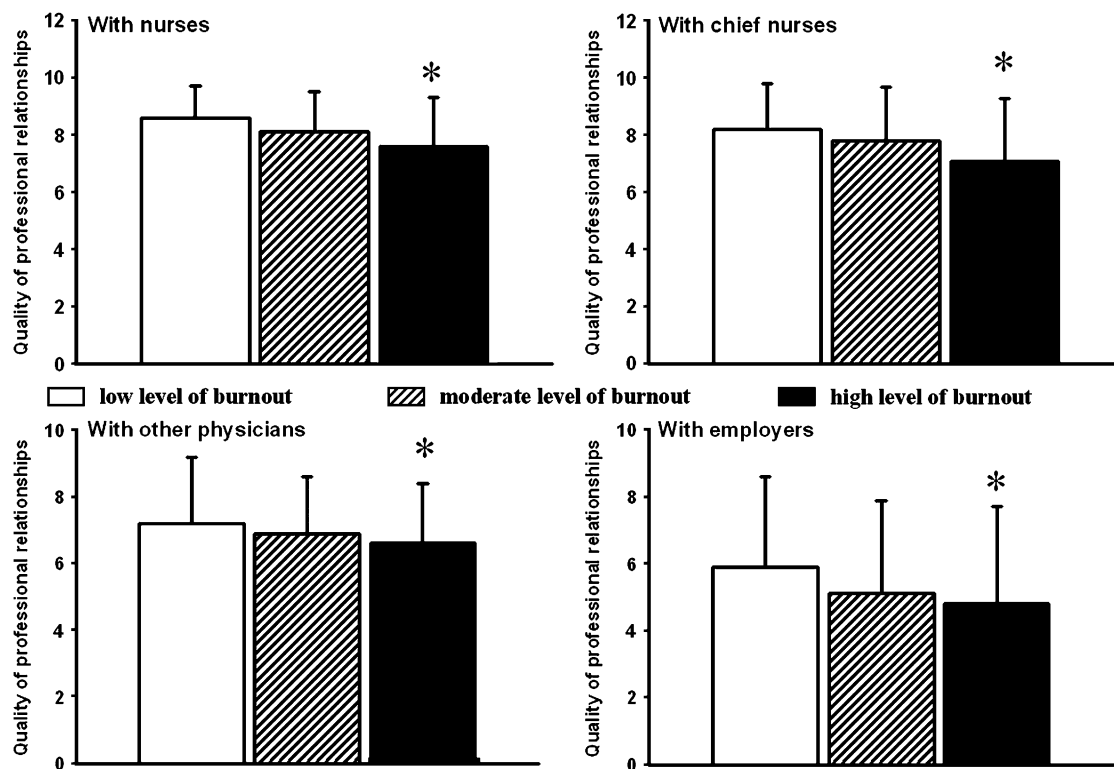


Figure 4. Relationships with other professionals. Professional relationships are quoted on a scale of 0 to 10. Values are expressed as means (SD). * $p \leq 0.001$ (high level of burnout vs. low and moderate).

the statistical analysis, although there are a large number of statistical tests, the p values were not corrected for multiple comparisons.

Previous investigations in a wide variety of settings have shown that burnout may affect performance (26) and quality of medical services (4). In a study on medical residents, a high depersonalization score was associated with self-reported sub-optimal patient care practices (5). Burnout has been associated with various forms of job withdrawal-absenteeism, intention to leave the job, and turnover. In the present study, about 50% of

the intensivists exhibiting a high level of burnout wish to leave their jobs. However, for people who stay on the job, burnout leads to lower productivity and effectiveness at work. Consequently, it is associated with decreased professional satisfaction and reduced commitment to the job or the organization (2).

Changing the working conditions and managing professional conflicts are essential for dealing with burnout. In a study concerning anesthesiologists, improving work organization (presence of skilled assistance in the operating theater) was the most important factor leading to reduced burnout (27). For Thomas,

TABLE 5. MULTIVARIATE ANALYSIS: FACTORS ASSOCIATED WITH A HIGHER MASLACH BURNOUT INVENTORY SCORE

Variable	OR (95% CI)	p Value
Demographic factor		
Female sex*	1.58 (1.09–2.30)	0.02
Organizational factors		
Night shifts per month, for each day	1.12 (1.02–1.23)	0.02
Night shift before the survey*	1.60 (1.06–2.44)	0.03
Period since the last nonworking week, for each day	1.003 (1.001–1.005)	0.02
Conflict with a nurse during the last 7 d*	1.70 (1.02–2.83)	0.04
Conflict with a colleague intensivist during the last 7 d*	2.73 (1.75–4.25)	0.001
Relationships with nurses, for each additional point of the 0–10 rating scale	0.85 (0.77–0.93)	0.001
Relationships with chief nurses, for each additional point of the 0–10 rating scale	0.77 (0.67–0.87)	0.001

Definition of abbreviations: CI = confidence interval; OR = odds ratio.

Continuous variables included in the model: age, working hours per week, intensive care unit practice, night shifts per month, night shift before the survey, period since the last nonworking day, period since the last nonworking week, relationships with nurses, relationships with chief nurses, relationships with employers, relationships with other physicians, and traveling time to work. Categorical variables included in the model: sex, children (none to one or more), status (interns/residents or fellows/attending physicians), compensation for overtime, conflict with a nurse during the last 7 days, conflict with a colleague intensivist during the last 7 days, conflict with a patient's family during the last 7 days, withholding/withdrawing treatment on the day of the survey, teaching hospital, relief from service until the next working day after a night shift, married or with a partner, and night shift before the survey.

* Dichotomized variable.

restricting work hours alone is not associated with a reduction in burnout (22).

Conflict of Interest Statement: None of the authors has a financial relationship with a commercial entity that has an interest in the subject of this manuscript.

References

- Maslach C, Jackson SE, Leiter MP. Maslach Burnout Inventory manual, 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
- Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol* 2001;52:397–422.
- Parker PAKJ. Burnout, self- and supervisor-rated job performance, and absenteeism among nurses. *J Behav Med* 1995;18:581–599.
- McCue JD. The effects of stress on physicians and their medical practice. *N Engl J Med* 1982;306:458–463.
- Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med* 2002;136:358–367.
- Ramirez AJ, Graham J, Richards MA, Cull A, Gregory WM, Leaning MS, Snashall DC, Timothy AR. Burnout and psychiatric disorder among cancer clinicians. *Br J Cancer* 1995;71:1263–1269.
- Grassi L, Magnani K. Psychiatric morbidity and burnout in the medical profession: an Italian study of general practitioners and hospital physicians. *Psychother Psychosom* 2000;69:329–334.
- Guntupalli KK, Fromm RE Jr. Burnout in the internist–intensivist. *Intensive Care Med* 1996;22:625–630.
- Coomber S, Todd C, Park G, Baxter P, Firth-Cozens J, Shore S. Stress in UK intensive care unit doctors. *Br J Anaesth* 2002;89:873–881.
- Caplan RP. Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers. *BMJ* 1994;309:1261–1263.
- Blenkin H, Deary I, Sadler A, Agius R. Stress in NHS consultants. *BMJ* 1995;310:534.
- Embriaco N, Azoulay E, Barrau K, Kentish N, Pochard F, Loundou A, Papazian L. Burnout in French intensivists [abstract]. *Intensive Care Med* 2006;32:S214.
- Canoui P, Mauranges A. Le burn out: le syndrome d'épuisement professionnel des soignants, 3rd ed. Paris: Editions Masson; 2004.
- Radloff LS. The CES-D scale: a self-report depression scale for research in general population. *Appl Psychol Meas* 1977;1:385–401.
- McCullagh P, Nelder JA. Monographs on statistics and applied probability 37: generalized linear models, 2nd ed. London: Chapman & Hall; 1989.
- Lemkau J, Rafferty J, Gordon R Jr. Burnout and career-choice regret among family practice physicians in early practice. *Fam Pract Res J* 1994;14:213–222.
- Keller KL, Koenig WJ. Management of stress and prevention of burnout in emergency physicians. *Ann Emerg Med* 1989;18:42–47.
- Deckard GJ, Hicks LL, Hamory BH. The occurrence and distribution of burnout among infectious diseases physicians. *J Infect Dis* 1992;165:224–228.
- Gallery ME, Whitley TW, Klonis LK, Anzinger RK, Revicki DA. A study of occupational stress and depression among emergency physicians. *Ann Emerg Med* 1992;21:58–64.
- Cathebras P, Begon A, Laporte S, Bois C, Truchot D. [Burn out among French general practitioners]. *Presse Med* 2004;33:1569–1574.
- Baldwin PJ, Dodd M, Wrate RM. Young doctors' health.–II. Health and health behaviour. *Soc Sci Med* 1997;45:41–44.
- Thomas NK. Resident burnout. *JAMA* 2004;292:2880–2889.
- Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV. Burnout and internal medicine resident work-hour restrictions. *Arch Intern Med* 2005;165:2595–2600.
- Stehle JL. Critical care nursing stress: the findings revisited. *Nurs Res* 1981;30:182–186.
- Biaggi P, Peter S, Ulich E. Stressors, emotional exhaustion and aversion to patients in residents and chief residents: what can be done? *Swiss Med Wkly* 2003;133:339–346.
- Weisman CS, Teitelbaum MA. Physician gender and the physician–patient relationship: recent evidence and relevant questions. *Soc Sci Med* 1985;20:1119–1127.
- Kluger MT, Townend K, Laidlaw T. Job satisfaction, stress and burnout in Australian specialist anaesthetists. *Anaesthesia* 2003;58:339–345.