A Stress Survey in Anesthesia Personnel in Thailand

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Objective: *To find out stressful events related to anesthesia and psychological responses in anesthesia personnel.*
Material and Method: *Three hundred fifty three nurses and 286 doctors from all over the country who currently working in operating theatres participated in this study. Research tools comprised of interactive online anesthesia-related and psychological stress tests. Data were analyzed as mean and standard deviations. Comparisons of all associated factors between groups were performed by the Kolmogorov-Smirnov Two-Sample test and t-test independent. Correlations between groups were determined by Spearman's rho and Pearson's. Statistical significance was defined as p-value less than 0.05 with a 95% confidence interval.*
Results: *Nurses expressed greater worries with impairment of cognitive and immune functions, particularly on night shifts. They had intense responsibility, compounded by lack of experiences and knowledge. Doctors were under stress during the day. This depended on their ages, experiences, morbidity rumors, working hours, and day off after operation, which manifested themselves as disturbances of the autonomic nervous system and emotions.*
Conclusion: *Nurse anesthetists expressed their worries, particularly on night shifts. Their psychological distresses were observed as impairment of cognitive and immune functions. Doctors were under professional stress during the day, which came across as disturbances of the autonomic nervous systems and emotions.*

Keywords: *Occupation-related stress, Peri-operative anesthesia*

J Med Assoc Thai 2015; 98 (4): 380-7
Full text. e-Journal: *http://www.jmatonline.com*

Medical errors have become a crucial societal and professional issue. People are more demanding, lawyers more litigious, and insurance companies less willing to pay. In addition, hospital directors are trying to improve their management efficiency. As a result, doctors and nurses have to work harder. Sadly, the prevalence of burnout is higher among employees who deal with patients[1,2].

Anesthesia personnel have been at the forefront of the patient safety movement. They must be reliable and skilled at communicating with surgeons, operating room (OR) nurses, and ancillary workers. Since patients undergoing anesthesia are getting older, sicker, and subjected to more complex procedures than in the past, doctors and nurses in anesthesia are expected to achieve and maintain their competencies. Thus, they take a zero-tolerance approach to avoidable problems in the provision of anesthesia. Inevitably, they face occasional stress peri-operatively such as long and unpredictable working hours[3], exposure to chemical and radiation hazards[4], or the occurrence of unexpected death, particularly when a given patient was previously healthy[5]. This can sometimes prove frustrating and may lead to unsafe practices.

Unfortunately, departments, institutions, and the law seem to overlook these problems. As a result, anesthetists have to maintain their physical, mental health, and special sensory capabilities[6]. Therefore, they experience some occupation-related stress leading to long-term sequelae, such as anxiety or depression, emotional exhaustion, and depersonalization[7]. As a result, some of them quit their jobs and retire sooner than the personnel in other specialties[8]. Moreover, they are at particular risk for certain illnesses and more prone to addictions and suicide than those in other fields[4]. Therefore, the present study was designed to find out stressful events related to anesthesia and psychological responses that crucially involved those worries.

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Material and Method

The present study was approved by the Siriraj Institutional Review Board (Si-IRB), number COA: Si445/2011 (11/08/2011), and written informed

consents were obtained from all subjects. The trial was registered at ClinicalTrials.gov, number NCT01500291 (27/12/2011).

The present study was a prospective study to survey stress on anesthesia personnel and verify causes and effects to their stress. Since Thailand has nearly 1,000 anesthesiologists and 3,000 nurse anesthetists, the sample size calculation for the primary outcome measures can be estimated as follows:

$$n = N\,[1 + N(e)^2]^{-1}$$

where n = sample size
N = population
e = sample variance (0.05)

For anesthesiologists $= 1{,}000\,[1 + 1{,}000(0.0025)]^{-1}$
$= 286$

For certified registered nurse anesthetists (CRNA)
$= 3{,}000\,[1+3{,}000(0.0025)]^{-1}$
$= 353$

The letters of invitation were circulated among anesthesia personnel in universities, municipal, and private hospitals. Participation was voluntary and without any honorarium. Their participation did not affect their careers in any way. The inclusion criteria were anesthesia personnel currently working in operating theatres. The exclusion criteria were those who did not work in operating theatres. The termination criterion was participants who withdrew from the project at any time.

We launched a communication channel via an online system and required that qualified participants registered and expressed their intention to join the study. After an informed consent was obtained, each registered participant received an identification number and a log-in password to the website containing the Siriraj Anesthesia-related Stress Test (SAST) and the Suanprung Stress Test (SPST). The program was interactive, with personal files for each participant on each test along with other details like date-month-year, log-in/log-out periods and time, as well as test scores. The participants were asked to voluntarily respond to all items in both tests. Their scores were immediately provided with the completion of each testing courseware, and scoring would be anonymous. However, they were free to skip any questions that would put them in an awkward position. Those who felt overwhelmed by the conditions were allowed to withdraw from the project at any time.

As the trial had been analyzed by the intention to treat, consecutive allocation was performed until the trial size was reached. The study took place where Internet connection was available around the clock between December 2011 and March 2012. During the study, we did not meet any participant. We were willing to answer queries about the project procedure and monitor individual participants' progress through the website, while keeping confidential data about individual participants. Authorized data collectors were not involved in subject recruitment or did not retrieve subject contact data from the system. Those located at a different site performed analysis of these data.

The SAST, an opinion poll on the peri-operative stress test, consists of six sections, 1) background data: age, gender, experience in anesthesia, 2) working data: working time, overnight shift, number of calls, 3) personal data: off-duty the day after serving, sleeping time, 4) patient safety issues: frequencies of various situations involving unsafe actions, occurrence of operating room events, 5) attitude when under pressure: revision to improve, disinterest, worry and obsession, regression and discouragement, isolation and indignation/outrage, and 6) ratings of sources of production pressure (Appendix A, contact correspondence). The open-ended questionnaires had undergone quality analysis and verification for conciseness, accuracy, and clarity, as well as content and structural validity by three doctorate educational experts with at least a decade of teaching experience. The index of congruence (IOC) was 0.79. The reliability analysis through Cronbach's alpha among the 25 residents and 35 nurse students in anesthesiology was 0.82 for the questionnaires, and 0.96, 0.97, and 0.96 for pre-, intra- and post-operative anesthetic events respectively. The ratings of sources of production pressure were scored through a numerical rating scale, most stressful (10), moderately stressful (5), and not stressful (0).

The SPST, a well-documented psychological stress test, consists of 60 questions with the following sections, 1) susceptibility to stress: daily physical and mental activities, 2) sources of stress: job, personal, family, social affair, environment, and finance, and 3) symptoms of stress: muscular stress, strain on the parasympathetic (PNS) and sympathetic nervous system (SNS), emotional, cognitive, endocrine, and immune stress (Appendix B, contact correspondence). The test had undergone verification for content validity and an index of item objective congruence (IOC) with more than 0.8 in Cronbach's alpha reliability coefficient, r more than 0.27 in concurrent validity through calculation of Pearson Product moment correlation against an electromyogram

biofeedback. The test was scored through five choices, most stressful (5), highly stressful (4), moderately stressful (3), mildly stressful (2), and not stressful (1).

The primary outcome

A psychological stress and stress related to the peri-operative period on anesthesia personnel were assessed.

The information derived from the open-ended questionnaire yielded values along with content analysis for our subsequent discussion.

Data analysis

Continuous data were presented as mean and standard deviation. Gender within the groups was compared by the Chi-square test. Comparisons of all associated factors between groups were performed by the Kolmogorov-Smirnov Two-Sample test and t-test independent. Correlations between groups were determined by Spearman's rho and Pearson's. Statistical significance was defined as *p*-value less than 0.05 with a 95% confidence interval.

Results

Six hundred thirty nine responses were given by 286 doctors (male 44; female 242), and 353 nurses (male 12; female 341) in anesthesia. Of the responses, males accounted for 8.8%, and females, 91.2%. Demographic characteristics including age, experience in anesthesia, working and personal data, and patient safety issues and attitudes when under pressure were shown in Table 1.

Nurses expressed much greater peri-operative stress than doctors (Table 2). Pre-operatively, they worried about the physical status, emergency cases, unexpected-change cases, choices of anesthesia, missing of pre-op visits, invasive monitoring, inability to cannulate intravenous lines, patients with missing incisors, cardiac arrhythmias, poor laboratory results, malignant hyperthermia, failed regional blocks, pediatric patients, and patients with irritable airways. Intra-operatively, their stress was on no/low urine outputs, high airway pressures, displacement of endotracheal tubes, and air/amniotic/fat embolism. Post-operatively, they were anxious about re-curarization/re-intubation, failure to awake, hypothermia, and anaphylactic/anaphylactoid reaction. On the other hand, doctors were merely concerned about impaired cognitive functions and neurological deficits in the post-operative period. Overall, 73.3% of all respondents admitted that an embarrassing

Table 1. Anesthesia personnel's demographic data

	Doctors (n = 286) n (%)	Nurses (n = 353) n (%)
General information		
Gender		
Male	44 (15.4)	12 (3.4)
Female	242 (84.6)	341 (96.6)
Age (year)		
20-25	-	22 (6.2)
26-30	-	57 (16.2)
31-35	9 (3.2)	83 (23.5)
36-40	36 (12.6)	49 (13.9)
41-45	143 (50.0)	58 (16.4)
46-50	67 (23.4)	39 (11.1)
51-55	21 (7.3)	28 (7.9)
56-60	8 (2.8)	17 (4.8)
More than 60	2 (0.7)	-
Experience in anesthesia (year)		
Less than 1	-	26 (7.4)
1-5	11 (3.9)	65 (18.4)
6-10	39 (13.6)	59 (16.7)
11-15	132 (46.2)	72 (20.4)
16-20	81 (28.3)	49 (13.9)
21-25	15 (5.2)	44 (12.5)
More than 25	8 (2.8)	38 (10.8)
Working data		
In operating room (hour/day)		
5-6	132 (46.2)	96 (27.2)
7-8	98 (34.3)	183 (51.8)
More than 8	56 (19.6)	74 (21.0)
In operating room (day/week)		
3	2 (0.7)	-
4	52 (18.2)	-
5	193 (67.5)	269 (76.2)
6	39 (13.6)	84 (23.8)
Night on-call duty (day/week)		
0	31 (10.8)	-
1	139 (48.6)	41 (11.6)
2	65 (22.7)	93 (26.3)
3	38 (13.3)	127 (36.0)
4	13 (4.6)	84 (23.8)
5	-	8 (2.3)
Time(s) on-call duty		
1	78 (27.3)	32 (9.1)
2	159 (55.6)	113 (32.0)
3	47 (16.4)	191 (54.1)
4	2 (0.7)	17 (4.8)
Practice hours on-call duty		
Less than 1	37 (12.9)	53 (15.0)
1-2	75 (26.2)	65 (18.4)
3-4	106 (37.1)	143 (40.5)
5-6	49 (17.1)	61 (17.3)
7-8	14 (4.9)	22 (6.2)
More than 8	5 (1.8)	9 (2.6)
Off-duty the day after serving		
Yes	218 (76.2)	239 (67.7)
No	68 (23.8)	114 (32.3)

Table 1. (cont.)

	Doctors (n = 286) n (%)	Nurses (n = 353) n (%)
Working data		
Hours of sleep per day (hour)		
1-2	3 (1.1)	-
3-4	85 (29.7)	65 (18.4)
5-6	192 (67.1)	211 (59.8)
7-8	6 (2.1)	72 (20.4)
More than 8	-	5 (1.4)
Patient safety issues		
Morbidity in the past six months		
1	128 (44.8)	89 (25.2)
2	54 (18.9)	43 (12.2)
3	1 (0.3)	-
4	-	-
5	-	-
6	103 (36.0)	221 (62.6)
Morbidity in your work		
1	9 (3.2)	-
2	28 (9.8)	-
3	43 (15.0)	114 (32.3)
4	27 (9.4)	147 (41.6)
5	139 (48.6)	67 (19.0)
6	40 (14.0)	25 (7.1)
Mortality in the past six months		
1	3 (1.1)	1 (0.3)
2	-	-
3	-	-
4	-	-
5	-	-
6	283 (98.9)	352 (99.7)
Mortality in your work		
1	225 (78.7)	275 (77.9)
2	52 (18.2)	78 (22.1)
3	9 (3.2)	-
Vulnerable anesthetic period		
Pre-op	8 (2.8)	21 (5.9)
Intra-op	56 (19.6)	64 (18.1)
Post-op	144 (50.3)	187 (53.0)
Post-op 48 hours	78 (27.3)	81 (23.0)
Vulnerable anesthetic time		
24.00-02.00	38 (13.3)	50 (14.2)
02.00-04.00	173 (60.5)	186 (52.7)
04.00-06.00	72 (25.2)	103 (29.2)
06.00-08.00	3 (1.0)	14 (3.9)
Attitude when under pressure		
Revision	87 (30.4)	61 (17.3)
Disinterest	26 (9.1)	36 (10.2)
Worry	112 (39.2)	153 (43.3)
Regression	47 (16.4)	78 (22.1)
Isolation	14 (4.9)	25 (7.1)

situation could arise during the induction of anesthesia whether the endotracheal tube would be successfully intubated.

On susceptibility to stress, nurses expressed much more concerns (22.5±7.3) than doctors did (21.2±7.7) (Table 3). Nurses' susceptibility to stress showed no correlation with gender, sex, experience, working data, and patient safety issue. However, it was significantly related to sources of stress like personal ones (Table 4), primarily financial (Table 3). Their vulnerable periods were pre- and intra-operative ones, mainly night duties (Table 4). On the other hand, doctors' susceptibility to stress correlated significantly with age, a lack of experience, hard/long working hours, getting off-duty the day after serving, and morbidity news in the past six months. The sources of stress were job, personal and family issues (Table 4), and household issues (Table 3). Their critical importance was peri-operative period and day duties (Table 4).

Regarding the stress symptoms, nurses expressed significantly in cognitive and immune functions, that were, (9.5±2.5) and (9.9±4.6) against (7.4±2.7) and (8.3±3.6) expressed by doctors (Table 3). When under pressure, they expressed their attitudes as worry and regression (Table 5). Interestingly, doctors expressed them more as disturbances of the parasympathetic nervous system, sympathetic nervous system and emotions, that were, (5.8±3.2), (6.9±3.2) and (11.3±3.2) against those expressed by nurses, (4.1±2.9), (6.3±3.1), and (10.4±3.8) respectively (Table 3). When under pressure, doctors expressed their attitudes as worry and revision (Table 5).

Discussion

The current study revealed that most participants were feminine, since women make up the majority of the anesthesia profession. Nurse anesthetists expressed greater worries, particularly on night shifts. Their psychological distresses were observed as impairment of cognitive and immune functions. On the contrary, anesthesiologists were under professional stress during the day, depending on age, experience, morbidity rumors, working hours, and a day off after operations. Their susceptibility to stress correlated more strongly with jobs, personal and family affairs, which came across as disturbances of the autonomic nervous system and emotions.

Evidently, endotracheal intubation was the most stressful event in anesthesia practice. Most personnel agreed that if they could intubate a patient successfully, anxiety about this assignment would disappear. As a result, they craved success during this critical period as soon as possible. This might support Kain et al[9] in showing that anesthesiologists reported

Table 2. Anesthesia personnel in response to peri-operative stressful events

Stressful events	Doctors (n = 286) mean (SD)	Nurses (n = 353) mean (SD)	*p*-value
Pre-operative period			
ASA > III	6.1 (2.3)	7.4 (1.3)	0.000
Emergency case	5.1 (2.7)	6.1 (2.2)	0.000
Cancelled case	2.5 (2.6)	2.3 (2.3)	0.290
Unexpected change case	4.2 (2.6)	4.9 (2.6)	0.001
Choice of anesthesia	3.0 (1.9)	3.6 (2.1)	0.000
Missing of pre-op visit	4.1 (2.4)	5.1 (2.6)	0.000
Patient identification	2.9 (2.5)	3.0 (2.4)	0.761
Invasive monitoring	4.1 (2.5)	6.2 (1.7)	0.000
Inability to cannulate IV line	5.3 (2.8)	6.2 (2.4)	0.000
Elderly patient	6.2 (2.0)	6.3 (2.2)	0.308
Airway problems (e.g. obesity)	7.2 (2.8)	7.3 (2.0)	0.348
Patient with missing incisors	4.4 (2.5)	4.9 (2.3)	0.007
Uncontrolled blood pressure	6.2 (2.6)	6.3 (2.2)	0.561
Myocardial ischaemia	9.1 (1.5)	9.1 (1.7)	0.915
Cardiac arrhythmias	7.1 (2.76)	8.1 (1.7)	0.000
Poor laboratory results (e.g. hypokalemia)	5.6 (2.5)	6.1 (1.8)	0.002
Aspiration-induction/intubation	9.1 (1.4)	9.2 (1.3)	0.486
Bronchospasm-induction/intubation	8.1 (2.0)	8.1 (1.8)	0.858
Inability to maintain airway	9.3 (1.2)	9.4 (1.3)	0.650
Inability to ventilate patient	9.3 (1.2)	9.2 (1.7)	0.546
Inability to intubate	9.2 (1.4)	9.2 (1.3)	0.528
Repeated intubation	6.4 (2.7)	6.7 (2.4)	0.139
Malignant hyperthermia	9.4 (1.5)	9.9 (0.6)	0.000
Post-op care	4.5 (2.4)	4.8 (2.2)	0.151
Unexpected adverse events	8.3 (1.9)	8.9 (1.9)	0.632
Failed regional block	4.1 (2.5)	4.6 (2.3)	0.004
Pediatric patients	5.1 (2.7)	6.3 (2.0)	0.000
Patient with irritable airways	5.6 (2.6)	7.2 (1.5)	0.000
Intra-operative period			
Massive bleeding	7.2 (1.8)	7.3 (1.8)	0.492
No/low urine output	4.9 (2.7)	6.1 (1.8)	0.000
Unstable vital signs	5.9 (2.7)	6.3 (2.6)	0.103
Hypothermia	4.4 (1.8)	4.7 (2.4)	0.123
Cardiac arrhythmia	7.2 (1.8)	7.1 (2.2)	0.503
Prolonged operation	4.5 (2.8)	4.5 (2.5)	0.929
High airway pressure	5.9 (2.9)	6.3 (2.1)	0.031
Oxygen desaturation	7.2 (2.9)	7.4 (2.7)	0.386
Leakage of endotracheal tube cuff	4.9 (2.9)	5.2 (2.8)	0.247
Patient movement - awakening	4.2 (2.9)	4.5 (2.8)	0.203
Inadequate regional block	4.7 (2.7)	4.9 (2.6)	0.182
Displacement of endotracheal tube	5.7 (3.0)	6.3 (2.5)	0.007
Epidural catheter obstruction	4.1 (2.7)	4.3 (2.6)	0.374
High end-tidal carbon dioxide	5.6 (2.9)	5.8 (2.7)	0.638
Air/amniotic/fat embolism	9.5 (1.1)	9.6 (0.8)	0.017
Post-operative period			
Re-curarization/re-intubation	6.0 (2.7)	7.2 (1.6)	0.000
Failure to awake	8.0 (2.6)	8.8 (1.7)	0.000
On oral/nasal airway	2.9 (2.4)	3.3 (2.4)	0.067
On ventilator	4.1 (2.9)	4.4 (2.7)	0.270
On endotracheal tube with T-piece	3.7 (2.7)	3.9 (2.6)	0.201
Unstable vital signs	7.1 (1.5)	7.1 (1.9)	0.632
Hypothermia	4.7 (2.6)	5.6 (2.4)	0.000
Oxygen desaturation	7.3 (2.6)	7.3 (2.3)	0.997
Impaired cognitive function	9.2 (1.2)	8.2 (1.5)	0.000
Neurological deficits	9.5 (0.9)	9.1 (1.4)	0.000
Cardiac arrest	9.8 (0.7)	9.8 (0.9)	0.707
Patient in pain	5.1 (2.6)	5.4 (2.5)	0.271
Anaphylactic/anaphylactoid reaction	8.3 (1.9)	8.6 (1.6)	0.018

no increased anxiety, as shown by their blood pressure, immediately after the induction of anesthesia.

Table 3. Comparisons of susceptibility to stress, sources and symptoms of stress

	Doctors (n = 286) mean (SD)	Nurses (n = 353) mean (SD)	*p*-value
Susceptibility	21.2 (7.7)	22.5 (7.3)	0.025
Sources	65.4 (11.2)	63.8 (12.1)	0.105
Job	22.9 (4.6)	22.4 (4.8)	0.207
Personal	9.5 (3.4)	9.1 (3.2)	0.172
Family	6.9 (3.1)	6.3 (3.9)	0.019
Social	7.0 (1.9)	6.9 (1.9)	0.707
Environmental	10.2 (3.3)	9.8 (3.6)	0.104
Financial	8.8 (2.7)	9.3 (2.6)	0.021
Symptoms	56.4 (13.1)	57.7 (15.4)	0.233
Muscular	8.3 (2.6)	8.8 (2.8)	0.057
Parasympathetic	5.8 (3.2)	4.1 (2.9)	0.000
Sympathetic	6.9 (3.2)	6.3 (3.1)	0.006
Emotional	11.3 (3.2)	10.4 (3.8)	0.002
Cognitive	7.4 (2.7)	9.5 (2.5)	0.000
Endocrine	8.3 (3.2)	8.8 (3.9)	0.124
Immune	8.3 (3.6)	9.9 (4.6)	0.000

As expected, nurses were more susceptible to stress than physicians. However, it did not show any correlation with demographic data. This might be possible for they spend only one year in training and work under doctors' supervision, resulting in lack of confidence, knowledge, and experience in patient management. In addition, their cognitive ability may not be as sharp, probably because of less work responsibility. Moreover, some medical staff added burdens to nurses by posing a communication barrier to discourage such nurses. For example, some reprimanded nurses for not following safety procedures or for disregarding patients' conditions. Others insulted nurses by ignoring their explanations. Therefore, nurses felt bad about the perception of their competency, thus limiting their self-esteem and eventually undercutting their immune power. Therefore, when under pressure, they failed to ease job stress and displayed worry and regression. Very few tried to correct this by revising such problems.

Nurses expressed considerable worries during night shifts, probably because most of them had to work on their own in the OR after sunset, calling for

Table 4. Correlation between susceptibility to stress with demographic data, anesthetic periods and sources of stress

Spearman's rho	Susceptibility to stress			
	Doctors (n = 286)		Nurses (n = 353)	
	Correlation	*p*-value	Correlation	*p*-value
Gender	0.009	0.880	0.041	0.439
Age	-0.210	0.000	0.092	0.086
Experience	-0.153	0.010	0.041	0.438
Working in operating room (hour/day)	0.123	0.038	-0.037	0.486
Working in operating room (day/week)	0.231	0.000	0.063	0.238
Night on-call duty (day/week)	0.062	0.298	0.101	0.058
Times on-call duty	0.061	0.302	0.043	0.421
Working hours on-call duty	0.025	0.679	-0.020	0.705
Off-duty the day after serving	-0.168	0.004	-0.035	0.509
Sleeping time (hour/day)	0.014	0.817	-0.009	0.862
Morbidity news in the past six months	-0.205	0.000	0.035	0.506
Mortality news in the past six months	-0.098	0.099	0.064	0.231
Morbidity news in work	0.065	0.275	0.086	0.108
Mortality news in work	-0.083	0.161	0.021	0.687
Pre-operative period	0.185	0.002	0.104	0.050
Intra-operative period	0.264	0.000	0.124	0.020
Post-operative period	0.153	0.010	0.025	0.638
Source of stress				
Job	0.204	0.001	0.098	0.066
Personal	0.215	0.000	0.135	0.011
Family	0.130	0.028	0.074	0.165
Social	0.056	0.345	0.033	0.542
Environmental	-0.007	0.907	0.054	0.316
Financial	0.057	0.337	0.064	0.234

Table 5. Anesthesia personnel's attitude when under pressure

Attitude	Doctors, n (%)	Nurses, n (%)	*p*-value
Revision	87 (30.4)	61 (17.3)	0.002
Disinterest	26 (9.1)	36 (10.2)	
Worry	112 (39.2)	153 (43.3)	
Regression	47 (16.4)	78 (22.1)	
Isolation	14 (4.9)	25 (7.1)	

help only under adverse events. Accordingly, they may be particularly prone to stress and strain because of intense responsibility and lack of sleep, compounded by lack of experience and knowledge[10]. In addition, they were poorly paid for their work. Apparently, they cannot handle an excessive workload, potentially leading to unsafe practice. This agreed with Anderson et al[11], who found higher incidences of burnout in those with less experience.

For anesthesiologists, job, family, and personal affairs played a combined role in work-life conflicts. For example, they have to cope as doctors while still captaining the family and working hard to earn extra money, fetching kids from schools, etc. This time-consuming effort not only maintained their families, but also made them proud. Yet, doctors in anesthesia have a sense of inferiority. They have to work round the clock to serve work schedules set by surgeons. As a result, their sense of personal accomplishment diminishes as partnership at work is affected by disrespectful behavior of some surgeons. These might explain why most anesthesiologists were relatively proactive about their retirement planning[12,13].

Practice in anesthesia requires mature personnel, as vigilance and deliberateness increase with age. Overnight work could result in exhaustion for on-call, young doctors who tend to experience stress, burnout, less healthy behaviors, and concentration lapses. In addition, personal collection of information on malpractices might lead to anxiety or depression. Day work tends to represent anesthesiologists' vulnerable moment because it involves a high workload and often emergency case. They typically have to supervise multiple surgeries or supervise more than one surgery simultaneously. Moreover, they are anxious about litigation for their negligence. Fortunately, when under pressure, some of them adopt good attitudes toward stress by facing and revising problems to correct them. This agreed with McCue and Sachs, who claimed that those who learned stress management techniques could alleviate their emotional exhaustion[14].

Despite the system's ease for online surveys, accuracy in data processing, and streamlining of operational research steps were somewhat limited since it was self-reporting and some responses might have been given by others. Authors could neither verify the identity of information submitters nor determine the reasons not to complete the questionnaires.

Conclusion

Nurse anesthetists expressed their worries, particularly on night shifts. Their psychological distresses were observed as impairment of cognitive and immune functions. Doctors were under professional stress during the day, which came across as disturbances of the autonomic nervous system and emotions.

What is already known on this topic?

Anesthesia personnel face occasional stress peri-operatively such as long and unpredictable working hours, exposure to chemical and radiation hazards, or the occurrence of unexpected death, particularly when a given patient was previously healthy. Therefore, they experience some occupation-related stress, leading to long-term sequelae, such as anxiety or depression, emotional exhaustion, and depersonalization.

What this study adds?

Authors assessed the impact of professional stress on anesthesia personnel. Nurse expressed greater worries, particularly on night shifts. Their psychological distresses were observed as impairment of cognitive and immune functions. On the contrary, doctors were under professional stress during the day, depending on age, experience, morbidity rumors, working hours, and a day off after operations. Their susceptibility to stress correlated more strongly with jobs, personal, and family affairs, which came across as disturbances of the autonomic nervous system and emotions.

Funding

This research project is supported by Mahidol University (24/09/2012). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Potential conflicts of interest

None.

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การศึกษาเชิงสำรวจภาวะเครียดในบุคลากรทางวิสัญญี

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วัตถุประสงค์: *เพื่อค้นหาสถานการณ์ต่าง ๆ ทางวิสัญญี ที่ทำให้เกิดภาวะเครียดและการตอบสนองทางจิตใจต่อเหตุการณ์นั้น ๆ ของบุคลากรทางวิสัญญี*

วัสดุและวิธีการ: *บุคลากรทางวิสัญญีทั่วประเทศที่สมัครใจและยังปฏิบัติงานในห้องผ่าตัด เป็นพยาบาลจำนวน 353 คน และแพทย์จำนวน 286 คน เครื่องมือวิจัยประกอบด้วย แบบทดสอบความเครียดทางวิสัญญีและทางจิตวิทยาผ่านระบบออนไลน์ ข้อมูลค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานถูกนำมาวิเคราะห์เปรียบเทียบปัจจัยต่าง ๆ ระหว่างกลุ่มด้วย Kolmogorow-Smirnov หาความสัมพันธ์ด้วย Spearman's rho และ Pearson's โดยกำหนดนัยสำคัญเมื่อ p-value น้อยกว่า 0.05 ที่ระดับความเชื่อมั่นร้อยละ 95*

ผลการศึกษา: *พยาบาลแสดงออกถึงความวิตกกังวลในการปฏิบัติงานช่วงเวลากลางคืน ในรูปของความบกพร่องทางสติปัญญาและภูมิคุ้มกัน เนื่องจากต้องรับผิดชอบสูงแต่ยังขาดความรู้และประสบการณ์ ส่วนแพทย์แสดงออกถึงความวิตกกังวลในการปฏิบัติงานช่วงเวลากลางวัน ในรูปของความแปรปรวนทางระบบประสาทอัตโนมัติและภาวะทางอารมณ์ ซึ่งขึ้นอยู่กับอายุ ประสบการณ์ ข่าวลือเกี่ยวกับผู้ป่วยเกิดทุพพลภาพ ระยะเวลาปฏิบัติงาน และวันหยุดหลังเวร*

สรุป: *พยาบาลวิสัญญีมีภาวะเครียดกับภาระงานช่วงกลางคืน การตอบสนองทางจิตใจส่งผลต่อสติปัญญาและภูมิคุ้มกัน ส่วนแพทย์วิตกกังวลกับภาระงานในช่วงกลางวัน ซึ่งส่งผลต่อระบบประสาทอัตโนมัติและอารมณ์*
