

A Stress Survey in Nurse Anesthetist Students

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Objective: To study the stress situation in nurse anesthetist students during a training program.

Materials and Methods: The present prospective study was to survey the stress level in 30 volunteered nurse anesthetist students by using the well-validated anesthesia related and psychological stress tests. All students responded to the questionnaires three times at two months interval, away from term examination of their academic year. The test scores were analyzed and interpreted for the severity of stress.

Results: Nurse anesthetist students had to work five days a week with night shifts and average sleeping time of five to six hours per day. Off-duty issues ($p=0.032$) and mortality/morbidity information ($p=0.015$) were a source of stress. The susceptibility to stress showed no correlation with gender, experience, working data, and patient safety issue; however, it was significantly related to sources of stress like personal problems ($p=0.045$), primarily family ($p=0.036$), and financial ($p=0.042$). Their vulnerable periods were pre- and intra-operative period, mainly night duties (60.0%). Nevertheless, most of them expressed critical revision (63.3%) to cope with the difficulties in anesthesia. Anesthesiology is an unaccustomed, stressful subject. Nurse anesthetist students were worried about the increasing of the compromising situation and the solution to stabilize patients during the surgical procedure. Though students were under the supervision of an attending staff, they usually were left alone intra-operatively in the operating theatre. This might easily aggravate the tension state to the beginners. Financial and family problems forced students to scale down their competency and learning achievement. However, most of them were mature enough to make a decision when confronting difficulties.

Conclusion: Nurse anesthetist students worked under pressure and expressed considerable worries because of tight training schedule, night shifts, and self-problems e.g., lack of sleep, financial, and family problems.

Keywords: Nurse anesthetist students, Training program, Occupational stress

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Currently, as the patients are more demanding, doctors and nurses must work harder. They must maintain their physical, mental health, and special sensory competency. Consequently, medical personnel are inevitably prone to stress from their daily work.

During the 1-year nurse-anesthetist training program, nurse anesthetist students must deal with stressful situation of peri-operative, such as long and unpredictable working hours, or the occurrence of unexpected death. This can sometimes be frustrating and may lead to unsafe practices. Though nurse anesthetist students work under the supervision of anesthesiologist and nursing staff, their personal lives are often difficult. They must adapt themselves to work with any upper levels of medical personnel including surgical team and residents, or lower ones

as paramedics. As a result, they become vulnerable, bearable subjects who must tolerate any pressure by any means.

After graduation with a bachelor's degree, a nurse anesthetist student must become a new student once again. This is not an easy role for anyone who did not attend class for years. Nevertheless, they now have the responsibilities not only to support themselves and family but also to maintain their status while studying. Therefore, they may come across unexpected situations in between their training. In the past few years, some nurse anesthetist students had to drop out or retire from their class. This problem challenges authorized personnel in academic program because it wastes time, money, and opportunity. If students face tension during their education and are not able to solve it, the stress becomes a vicious matter that yields poor learning outcomes. As a result, investigators would like to study the stress-related factors during the nurse-anesthetist learning program and to verify the crucial period of anesthesia that involves a high work stress in nurse

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anesthetist students by using the Siriraj Anesthesia-related Stress Test (SAST) and Suan Prung Stress Test (SPST)⁽¹⁾.

Materials and Methods

After the Siriraj IRB approval (682/2559-EC4); the present trial was registered by the ClinicalTrials.gov (NCT 03094338), and written informed consents were obtained from all subjects.

The present prospective study, which was done between March 2017 and July 2017, was to survey the stress level in 30 volunteered nurse anesthetist students without any honorarium. Their only benefit was self-awareness of stress. Exclusion criteria were nurse anesthetist students who wanted to withdraw from the project at any time.

Research tools were anesthesia related and psychological stress tests, the SAST and SPST.

The SAST, an opinion poll on the peri-operative stress test, consists of six sections, 1) background, 2) working data, 3) personal data, 4) patient safety issues, 5) attitude when under pressure, and 6) ratings of sources of production pressure (Appendix A, contact correspondence). The index of item-objective congruence (IOC) was 0.79. The reliability analysis through Cronbach's alpha 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 no stressful (0).

The SPST is a well-documented psychological stress test that consists of 60 questions, regarding susceptibility to stress, sources, and symptoms of stress, 1) susceptibility to stress, 2) sources of stress, and 3) symptoms of stress. The test had undergone verification for content validity and an index of 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).

All students had to respond the questionnaires three times at two months interval, away from term examination of their academic study. Therefore, their participation did not affect their academic scores in any way. The test score was analyzed and interpreted for the severity of stress.

Statistical analysis

No sample size calculation was needed since all participants were currently under the 1-year training program. Continuous data were presented as median (min, max), mean \pm standard deviation and evaluated for statistical significance using the Statistical Package for Social Sciences for Windows, release 17. All associated factors were analyzed by Friedman Test and Dunn's Multiple Comparison Test as well as Tukey HSD and Dunnett T3 following the Levine's test. Correlations between groups were determined by Spearman's rho and Pearson's. The statistically significant differences were noted when p -value were lower than of 0.05 with a 95% confidence interval. The information from open-ended questionnaires yielded values along with content analysis for our subsequent discussion.

Results

Demographic characteristics revealed that nurse anesthetist students were three males (10.0%) and 27 females (90.0%). Four were aged between 20 and 25 years (13.3%), 19 were between 26 and 30 years (63.3%), six were between 31 and 35 years (20.0%), and one was between 36 and 40 years (3.3%). Eighteen (60.0%) had less than one year experienced in anesthesia, eight (26.7%) had between 1 and 5 years, three (10.0%) had between 6 and 10 years, and one (3.3%) had between 11 and 15 years (Table 1).

For the work data, the survey reveals that 3.3% work 5 to 6 hours per day during the day shift, 66.7% work 7 to 8 hours, and 30.0% work over 8 hours. Additionally, 3.3% work three day per week during the day shift, 93.4% work five days per week, and 3.3% work six days per week. We also found that 76.7% work one day per week during the night shift, 13.3% work two days, 6.7% work four days and 3% work days. The students receive 1 call per night (10%), 2 (66.7%), 3 (20.0%), and 4 (3.3%) and the call last 1 to 2 hours (30.0%), and 3 to 4 hours (70.0%) (Table 1).

For the personal data, the survey found that 90% leave after the night shift while 10% remain. Sixteen-point-seven percent of the student have three to four hours of sleeping time per day while 76.7 have five to six, and 6.6% have seven to eight hours of sleeping time per day (Table 1).

In the patient safety issues, the occurrence of morbidity cases in the last six months were 0 (46.7%), 1 (20.0%), 2 (20.0%), 3 (3.3%), and 5 (10.0%), while the lifetime occurrence of morbidity cases were 1 (43.3%), 2 (40.0%), 3 (6.7%), 5 (6.7%), and 6 (3.3%).

Table 1. Nurse anesthetist students' demographic data

	Nurse anesthetist students (n = 30), n (%)
General information	
Gender	
• Male	3 (10.0)
• Female	27 (90.0)
Age (year)	
• 20 to 25	4 (13.3)
• 26 to 30	19 (63.3)
• 31 to 35	6 (20.0)
• 36 to 40	1 (3.3)
Experience in anesthesia (year)	
• Less than 1	18 (60.0)
• 1 to 5	8 (26.7)
• 6 to 10	3 (10.0)
• 11 to 15	1 (3.3)
Working data	
In operating room (hour/day)	
• 5 to 6	1 (3.3)
• 7 to 8	20 (66.7)
• More than 8	9 (30.0)
In operating room (day/week)	
• 3	1 (3.3)
• 4	0 (0.0)
• 5	28 (93.4)
• 6	1 (3.3)
Night on-call duty (day/week)	
• 0	-
• 1	23 (76.7)
• 2	4 (13.3)
• 3	0 (0.0)
• 4	2 (6.7)
• 5	1 (3.3)
Time(s) on-call duty	
• 1	3 (10.0)
• 2	20 (66.7)
• 3	6 (20.0)
• 4	1 (3.3)
Night on-call duty (day/week)	
• 0	-
• 1	23 (76.7)
• 2	4 (13.3)
• 3	0 (0.0)
• 4	2 (6.7)
• 5	1 (3.3)
Time(s) on-call duty	
• 1	3 (10.0)
• 2	20 (66.7)
• 3	6 (20.0)
• 4	1 (3.3)
Practice hours on-call duty	
• Less than 1	0 (0.0)
• 1 to 2	9 (30.0)
• 3 to 4	21 (70.0)
Off-duty the day after serving	
• Yes	27 (90.0)
• No	3 (10.0)
Hours of sleep per day (hour)	
• 1 to 2	-
• 3 to 4	5 (16.6)
• 5 to 6	23 (76.7)
• 7 to 8	2 (6.7)

Table 1. (continued)

	Nurse anesthetist students (n = 30), n (%)
Patient safety issues	
Morbidity in the past six months	
• 0	14 (46.7)
• 1	6 (20.0)
• 2	6 (20.0)
• 3	1 (3.3)
• 4	0 (0.0)
• 5	3 (10.0)
Morbidity in your work	
• 1	13 (43.3)
• 2	12 (40.0)
• 3	2 (6.7)
• 4	0 (0.0)
• 5	2 (6.7)
• 6	1 (3.3)
Mortality in the past six months	
• 1	15 (50.0)
• 2	8 (26.7)
• 3	4 (13.3)
• 4	1 (3.3)
• 5	0 (0.0)
• 6	2 (6.7)
Mortality in your work	
• 1	18 (60.0)
• 2	6 (20.0)
• 3	2 (6.7)
• 4	1 (3.3)
• 5	1 (3.3)
• 6	2 (6.7)
Vulnerable anesthetic period	
• Pre-op	0 (0.0)
• Intra-op	25 (83.4)
• Post-op	4 (13.3)
• Post-op 48h	1 (3.3)
Vulnerable anesthetic time	
• 16.00 to 20.00	1 (3.3)
• 20.00 to 24.00	3 (10.0)
• 24.00 to 02.00	3 (10.0)
• 02.00 to 04.00	18 (60.0)
• 04.00 to 06.00	2 (6.7)
• 06.00 to 08.00	3 (10.0)
Attitude when under pressure	
• Revision	19 (63.3)
• Disinterest	0 (0.0)
• Worry	5 (16.7)
• Regression	5 (16.7)
• Isolation	1 (3.3)

The occurrence of mortality cases in the last six months were 0 (50.0%), 1 (26.7%), 2 (13.3%), 3 (3.3%), and 5 (6.7%) while the lifetime occurrence of mortality cases were 1 (60.0%), 2 (20.0%), 3 (6.7%), 4 (3.3%), 5 (3.3%), and 6 (6.7%). According to the students, the unsafe period was the pre-operative in 0 (0%), intra-operative in 25 (83.3%), post-operative in 4 (13.3%), and post-operative 48 hour in 1 (3.3%) and the unsafe time was 16.00 to 20.00 in 1 (3.3%), 20.00 to 24.00 in 3 (10.0%), 24.00 to 02.00 in 3 (10.0%), 02.00 to 04.00

Table 2. Nurse anesthetist students in response to peri-operative stressful events

Stressful events	Test 1 (n = 30) Median (min, max)	Test 2 (n = 30) Median (min, max)	Test 3 (n = 30) Median (min, max)	p-value
Pre-operative period				
ASA >III	4 (3, 5)	3 (1, 4)	3 (1, 4)	0.004*
Emergency case	4 (2, 5)	3 (2, 5)	3 (2, 5)	0.017*
Cancelled case	2 (1, 4)	2 (1, 3)	2 (1, 3)	0.687
Unexpected change case	3 (2, 4)	3 (1, 5)	3 (1, 4)	0.768
Choice of anesthesia	3 (1, 5)	2 (1, 4)	2 (1, 4)	0.025*
Missing of pre-op visit	3 (1, 5)	3 (1, 5)	3 (2, 5)	0.325
Patient identification	2 (1, 5)	2 (1, 5)	2 (1, 5)	0.698
Invasive monitoring	2 (2, 4)	3 (1, 4)	3 (1, 4)	0.988
Inability to cannulate IV line	3 (1, 4)	3 (1, 5)	3 (2, 5)	0.633
Elderly patient	3 (1, 5)	3 (1, 5)	3 (2, 4)	0.589
Airway problems e.g., obesity	4 (1, 5)	3 (1, 5)	3.5 (2, 5)	0.52
Patient with missing incisors	2 (1, 4)	2 (1, 5)	3 (1, 5)	0.964
Uncontrolled blood pressure	4 (2, 5)	3 (2, 5)	3.5 (2, 5)	0.083
Myocardial ischemia	4 (2, 5)	4.5 (2, 5)	4 (2, 5)	0.662
Cardiac arrhythmias	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.122
Poor lab results e.g., hypokalemia	3 (1, 5)	3 (1, 5)	3 (1, 5)	0.985
Aspiration - induction/intubation	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.833
Bronchospasm - induction/intubation	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.488
Inability to maintain airway	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.471
Inability to ventilate patient	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.117
Inability to intubate	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.418
Repeated intubation	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.768
Malignant hyperthermia	5 (3, 5)	5 (3, 5)	5 (3, 5)	0.814
Post-op care	3 (1, 4)	3 (1, 4)	3 (1, 4)	0.646
Unexpected adverse events	4 (2, 5)	3 (2, 5)	4 (2, 5)	0.144
Failed regional block	3 (1, 5)	3 (1, 5)	3 (2, 5)	0.278
Pediatric patients	4 (2, 5)	3 (2, 5)	3 (1, 5)	0.083
Patient with irritable airways	4 (2, 5)	3 (2, 5)	3 (2, 5)	0.012*
Intra-operative period				
Massive bleeding	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.073
No/low urine output	3 (2, 5)	3 (2, 5)	3 (1, 5)	0.391
Unstable vital signs	4 (1, 5)	3 (2, 5)	3 (1, 5)	0.399
Hypothermia	3 (1, 4)	3 (1, 4)	3 (1, 4)	0.962
Cardiac arrhythmia	4 (2, 5)	4 (1, 5)	4 (2, 5)	0.295
Prolonged operation	3 (1, 5)	3 (1, 4)	3 (1, 4)	0.723
High airway pressure	3 (2, 5)	3 (2, 5)	3 (2, 5)	0.182
Oxygen desaturation	4 (2, 5)	4 (3, 5)	4 (2, 5)	0.26
Leakage endotracheal cuff	3 (2, 5)	3 (2, 5)	3 (2, 5)	0.815
Pt movement - awakening	3 (1, 5)	3 (1, 4)	3 (1, 5)	0.079
Inadequate regional block	3.5 (1, 5)	3 (1, 5)	3 (2, 5)	0.058
Displace endotracheal tube	4 (1, 5)	3 (2, 5)	3 (2, 5)	0.988
Epidural catheter obstruction	3 (1, 5)	3 (1, 5)	3 (1, 5)	0.637
High end-tidal carbon dioxide	4 (2, 5)	3 (1, 5)	3 (2, 5)	0.684
Air/amniotic/fat embolism	5 (2, 5)	5 (3, 5)	5 (3, 5)	0.551
Post-operative period				
Re-curarization/re-intubation	4 (1, 5)	4 (2, 5)	4 (2, 5)	0.949
Failure to awake	4 (2, 5)	4 (2, 5)	4 (2, 5)	0.713
On oral/nasal airway	2.5 (1, 4)	2 (1, 4)	2 (1, 4)	0.121
On ventilator	3 (1, 5)	3 (1, 5)	3 (1, 5)	0.607
Endotracheal tube/T-piece	3 (1, 4)	3 (1, 4)	3 (1, 5)	0.96
Unstable vital signs	3.5 (2, 5)	3 (2, 5)	3 (1, 5)	0.839
Hypothermia	3 (1, 5)	3 (1, 4)	3 (1, 5)	0.589
Oxygen desaturation	4 (2, 5)	4 (3, 5)	4 (2, 5)	0.108
Impaired cognitive function	3 (2, 5)	3 (2, 5)	3 (2, 5)	0.49
Neurological deficits	4 (3, 5)	4 (2, 5)	4 (2, 5)	0.617
Cardiac arrest	5 (4, 5)	5 (3, 5)	5 (2, 5)	0.179
Patient in pain	3 (1, 4)	3 (2, 5)	3 (1, 5)	0.961
Anaphylactic/anaphylactoid	4 (3, 5)	4 (2, 5)	4 (2, 5)	0.236

* Using Friedman Test with Dunn's Multiple Comparison Test ($p < 0.05$)

in 18 (60.0%), 04.00 to 06.00 in 2 (6.7%), and 06.00 to 08.00 in 3 (10.0%) (Table 1).

For the attitudes toward stress, 19 (63.3%) have

revision, 0 (0%) have disinterest, 5 (16.7%) have worry, 5 (16.7%) have regression, 1 (3.3%) have isolation, and 0 (0%) are angry.

All nurse anesthetist students completed the questionnaires. Pre-operatively, they were anxious significantly about the patients' physical status ($p=0.004$), emergency cases ($p=0.017$), choice of anesthesia ($p=0.025$), and patient with irritable airway ($p=0.012$). However, their stress was generalized on various events in intra- and post-operative period (Table 2).

The susceptibility to stress showed no correlation with gender, age, and working experience; however, it was significantly related to sources of stress like personal problems ($p=0.045$), primarily family ($p=0.036$), and financial ($p=0.042$). In addition, nurse anesthetist students showed significant concern about their off-duty day and mortality news in their work (Table 3, 4).

Discussion

The anesthesia related (SAST) and the psychological stress tests (SPST) used to survey the tension condition in 30 volunteered nurse anesthetist students revealed that most of them had less than 1-year experience in anesthesia. They had to work 5 days a week with a night shift and had an average sleeping time of 5 to 6 hours per day. Their off-duty time and mortality/morbidity information became their great concerns. Though, they were anxious pre-operatively about the patients' physical status, emergency cases, choice of anesthesia, and patient with irritable airway, they felt unsafe intra-operatively, particularly between 02.00 and 04.00 AM. Interestingly, their family and financial situation were their primary causes of stress. Nevertheless, most of them expressed critical revision to cope with the difficulties in anesthesia.

Nurse anesthetist students have to work laboriously during their training program since anesthesiology is a new subject to them. Anesthesia is an exacting branch of medicine, dealing primarily in the management of patients under sedation. It takes a significant investment in time and training to have the expertise in the subject. It is also such a critical matter that everyone takes the precaution of ensuring safety healthcare. For example, the way to secure the airway is vital during the induction and intubation of anesthesia as it is crucial in lifesaving. Some serious conditions such as air embolism need urgent medical attention, as it is a significant contributing factor to patient morbidity/mortality. Though anesthesia is generally safe, complications can occur, e.g., an allergic reaction to an anesthetic agent can be life threatening and may happen with any type of anesthesia^(2,3).

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

	Test 1 (n = 30) Mean ± SD	Test 2 (n = 30) Mean ± SD	Test 3 (n = 30) Mean ± SD	p-value
Susceptibility	25.6±6.6	25.5±2.3	24±5.0	0.243
Sources	57.3±17.1	56.8±16.1	52.8±18.0	0.488
Job	22.2±5.2	21.0±4.6	19.4±5.4	0.103
Personal	9.9±3.4	9.5±2.9	8.9±3.4	0.481
Family	6.6±3.4	6.5±4.2	5.6±3.9	0.036*
Social	4.2±2.2	4.5±1.9	4.3±2.1	0.368
Environmental	7.8±3.8	7.4±4.2	7.4±4.0	0.798
Financial	6.6±3.4	8.0±3.4	7.2±3.9	0.042*
Symptoms	49.4±19.9	48.2±20.8	43.3±21.5	0.113
Muscular	6.6±3.0	7.3±3.2	6.6±3.3	0.154
Parasympathetic	5.4±2.6	5.3±2.9	5.2±3.7	0.896
Sympathetic	5.5±3.0	5.1±2.6	5.0±3.1	0.321
Emotional	9.4±4.2	9.7±4.5	8.0±4.5	0.055
Cognitive	7.9±3.9	7.9±4.2	6.6±3.3	0.075
Endocrine	7.9±4.0	7.2±3.5	6.4±3.6	0.117
Immune	6.7±4.1	5.8±4.2	5.5±3.8	0.364

SD = standard deviation

* Using repeated measure ANOVA ($p<0.05$)

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

Spearman's rho	Correlation	p-value
Gender	0.213	0.259
Age	0.296	0.112
Experience	0.184	0.330
Working in operating room (hour/day)	0.114	0.548
Working in operating room (day/week)	0.120	0.528
Night on-call duty (day/week)	0.062	0.745
Times on-call duty	-0.137	0.472
Working hours on-call duty	0.245	0.193
Off-duty the day after serving	0.393	0.032*
Sleeping time (hour/day)	-0.073	0.701
Morbidity news in the past six of months	-0.153	0.418
Morbidity news in work	-0.098	0.605
Mortality news in the past six of months	0.021	0.913
Mortality news in work	-0.439	0.015*
Pre-operative period	0.272	0.146
Intra-operative period	0.201	0.288
Post-operative period	0.134	0.481
Source of stress		
Job	0.241	0.200
Personal	0.369	0.045*
Family	0.308	0.098
Social	0.267	0.153
Environment	0.324	0.081
Financial	0.254	0.175

* $p<0.05$

Students were apprehensive pre-operatively and felt unsafe intra-operatively particularly before dawn. This implied that they were worried about the

development of a compromising situation and the solution to stabilize patients during a procedure. As an apprentice in anesthesia, they must confront all kind of people in an unusual environment to fulfill anesthesia standard practices. If a circumstance was beyond their expectation or yielded an unfriendly situation, they feel unhappy and depressed. Perez et al in the study regarding stress perception by nurse anesthesia students stated that anesthesia education was highly stressful. Some students experienced a significant level of stress and that lead to failure and unhappiness. They also demonstrated a need for schools to develop stress management programs when its signals were recognized early⁽⁴⁾.

During the training program, students are normally under the supervision of a senior nurse or an attending anesthesiologist. Pre-operatively, trainees are on a strictly need-to-know basis of pre-anesthetic management to their patients undergoing general or regional anesthesia. The stress might due to they their lack of experience in response to adverse events. Post-operatively, they must avoid prolonging the anesthesia resulting in delayed awakening and regaining consciousness. However, initially, staff usually accompany students during pre-and post-operative period, until the student has enough knowledge. Ironically, students mostly were left alone in the operating theatre to monitor patients for proper maintenance of anesthesia during the long intra-operative phase. Consequently, this may easily aggravate the tension state of the beginners.

Nurse anesthetist students are normally working registered nurses. Other than studying, some of them have part-time jobs to cover the cost of their education, raising kids, or repaying debts. Eventually, an accumulation of bills develops a vicious cycle of debts and interests. Moreover, a shortage of money will force the students to scale down their competency and learning achievement. Financial stress becomes a predictor of both physical and mental health problems⁽⁵⁾. This also agreed with Steele et al who claimed that the inter-connections between education, family, and social spheres of life were integral to the experiences and outcomes of mature student participation in education⁽⁶⁾. Lauder and Cuthbertson⁽⁷⁾ also investigated the financial and family problems that mature students experience as a direct result of undertaking a course in nursing education. It was found that most mature students experienced financial, childcare, relationship, and family problems, and many of them thought about leaving the study course as a

result of these problems⁽⁷⁾. The authors suggest that if nurse anesthetist is really in demand for national public health service, this is the time to set a low-cost educational program for them.

Though nurse anesthetist students might encounter some difficulties in anesthesia, they expressed critical revision as a solution to sooth their troubled minds. This implied that most students were strong enough, as adult learning is good for all professional education. On this topic, Galbraith et al in a study ‘a survey of student nurses’ attitudes toward help seeking for stress’ found that most students would disclose their own stress to family and friends rather than to colleagues or professional institutions. They suggested that negative attitudes toward stress might be entrenched even before training and the faculty should be more supportive and have accepting attitudes to pressure in order to tackle its unwanted consequences⁽⁸⁾. The authors propose that though responsibility, experience, and work hours are very important in anesthetic practices, the faculty should have solutions to alleviate nurse anesthetist students’ stress before and during the training program.

Conclusion

Nurse anesthetist students must deal with stressful situation from the beginning of the school term. They work under pressure due to the tight training schedule, lack of sleep, financial, and family problems and feel incompetence during night shifts.

What is already known on this topic?

To become a nurse anesthetist, a registered nurse must take a 1-year training program in anesthesia. Though students are under the supervision of an attending staff. They are worried about the increasing of the compromising situation and the solution to stabilize patients during a surgical procedure. This is not an easy role for the students that have been working for years and return to school, as they have responsibilities not only to support themselves and their family but also to maintain their status while studying. Some students must drop out from their class, resulting in a waste of time, money, and academic opportunity.

What this study adds?

Anesthesiology is a new and stressful subject to nurse anesthetist students. They worked under pressure due to tight training schedule and lack of sleep, and expressed considerable worries during night shifts. In addition, financial and family problems forced them to scale down their competency and learning

achievement. However, most of them were mature enough to decide when confronted by difficulties in anesthesia.

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Potential conflicts of interest

The authors declare no conflict of interest.

References

1. Vichitvejpaisal P, Mahatnirunkul S. A stress survey in anesthesia personnel in Thailand. *J Med Assoc Thai* 2015;98:380-7.
2. Newman T, Weatherspoon D. What's to know about general anesthesia? [Internet]. 2018 [cited 2018 Jan 10]. Available from: <https://www.medicalnewstoday.com/articles/265592.php>.
3. Decker F. How hard is it to become an anesthesiologist? [Internet]. 2018 [cited 2018 Jan 10]. Available from: <http://work.chron.com/hard-become-anesthesiologist-13345.html>.
4. Perez EC, Carroll-Perez I. A national study: stress perception by nurse anesthesia students. *AANA J* 1999;67:79-86.
5. Cuthbertson P, Lauder W, Steele R, Cleary S, Bradshaw J. A comparative study of the course-related family and financial problems of mature nursing students in Scotland and Australia. *Nurse Educ Today* 2004;24:373-81.
6. Steele R, Lauder W, Caperchione C, Anastasi J. An exploratory study of the concerns of mature access to nursing students and the coping strategies used to manage these adverse experiences. *Nurse Educ Today* 2005;25:573-81.
7. Lauder W, Cuthbertson P. Course-related family and financial problems of mature nursing students. *Nurse Educ Today* 1998;18:419-25.
8. Galbraith ND, Brown KE, Clifton E. A survey of student nurses' attitudes toward help seeking for stress. *Nurs Forum* 2014;49:171-81.