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Development of an Educational Seminar on Coping with Stress for Nurse Anesthesia Trainees

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Abstract

Stress is the body's way of responding to something out of the norm, or a stressor. Stressors affect nurse anesthesia trainees (NATs) to unpredictable levels of stress. The purpose of this study was to explore stressors experienced, ways to cope with stressors as perceived by NATs, if there was any association between socio-demographic variables to the various ways of coping with stress, and development of a one-hour seminar on different ways to cope with stress during a nurse anesthesia program.

A survey was distributed to members of the Illinois Association of Nurse Anesthetists (IANA), which identified demographic information, stressors, and coping mechanisms experienced by anesthesia providers while enrolled in anesthesia school. Results from 165 respondents indicated no statistically significant relationship between demographics and coping mechanisms. The most commonly reported stressors included a change in financial income, a decrease in work hours, recreational activities, sleeping, and eating habits. The background information on the importance of identifying stressors, stress, and coping mechanisms was translated into an educational seminar for future NATs.

Introduction

Students admitted to nurse anesthesia programs are prepared for a rigorous curriculum, but many are overwhelmed with stress that occurs in addition to school. Stress in nurse anesthesia trainees (NATs) is evident and has been long documented (Wildgust, 1986). Stress is a state of mental, emotional, or physical tension under difficult conditions and is the body's way of reacting to an event or situation. It serves as both a behavioral and physiologic response to a stimulus (Wildgust, 1986). For the purposes of this research, individual responses to stress were studied. Multiple studies have been conducted to identify stress, self-efficacy, and perception of stress in NATs; however, there is minimal research indicating ways of coping to manage stress. The ability to identify and cope with stress allows an individual to optimally deal with stressors and attain better mental, emotional, and physical health.

Stress is described as acute or chronic, with acute being more common (Chipas & McKenna, 2011). Intensity and duration of stress is described as acute when an individual is able to cope with the effects of stress. The onset of acute stress is recognized by the development of behavioral, emotional, and physical manifestations. If not resolved, acute stress transitions into chronic stress. In the chronic state, the body negatively adapts and the individual loses the ability to recognize manifestations of stress on their own. Left untreated, this increased, long-standing stress can take a toll on the body physically, mentally, and emotionally.

NATs are professional nurses who, prior to starting anesthesia school, were very comfortable in their previous role as a registered nurse. NATs begin graduate school, and the feeling of comfort is lost when they are placed in an unfamiliar environment such as the classroom setting or operating room. The new and demanding environment provides ample opportunities for the development of physical, mental, and emotional stress. According to

Chipas & McKenna (2011), too little stress leads to boredom, however too much stress leads to panic and tension. A moderate amount of stress is necessary to stimulate the brain and learn in anesthesia school, to complete tasks. And to allow development in practice; however, excessive levels of stress causes impaired learning, and mistakes are more likely to happen (Wildgust, 1986). The ability to adapt to stress in a new field of study and work occurs over time, and it is imperative to integrate coping mechanisms for stress to maintain physical and mental health and manage stress effectively (Kendrick, 2000).

Problem Statement

Nurse anesthesia trainees struggle to utilize ways to cope with stress during anesthesia school. Literature has identified major events that cause stress, but there is minimal research on effective ways to cope with stress.

Purpose of the Study

The purposes of this study were to:

1. Explore individual stressors among nurse anesthesia trainees.
2. Describe ways to cope with the perceived stressors perceived by nurse anesthesia trainees.
3. Explore any association of socio-demographic variables and various ways of coping with stress.
4. Based on the results, a one-hour seminar on different ways to cope with stress during the nurse anesthesia program was developed.

Clinical Questions

Research questions addressed in this study included:

1. What are the stressors of anesthesia school as perceived by nurse anesthesia trainees?

2. What are the different ways of coping with stress during anesthesia school as perceived by nurse anesthesia trainees?
3. What sociodemographic factors are associated with ways of coping with stress?

Conceptual Framework

The theory guiding the conceptual framework of this study is the Transactional Model of Stress and Coping developed by Lazarus and Folkman (1984). This stress and coping theory gives an understanding of the stressors and ways of coping with stress in nurse anesthesia trainees. Lazarus and Folkman (1984) depict stress as occurring between a person and the environment. Coping is a process that intervenes between the person and the environment. When an event is perceived as stressful, this indicates there is a possibility for a negative change, challenge, or threat (Lazarus & Folkman, 1984). After identifying the perceived stress, the individual evaluates what can be done about the perceived stressor. Interventions for stress require knowing various ways of coping with stress (Lazarus & Folkman, 1984). Like this model, NATs evaluate the stress and challenges of school, determine what is manageable with resources available, and evaluate ways of coping to alter perceived stress. In this conceptual framework, the addition of school is viewed as a stressor as seen in Figure 1.

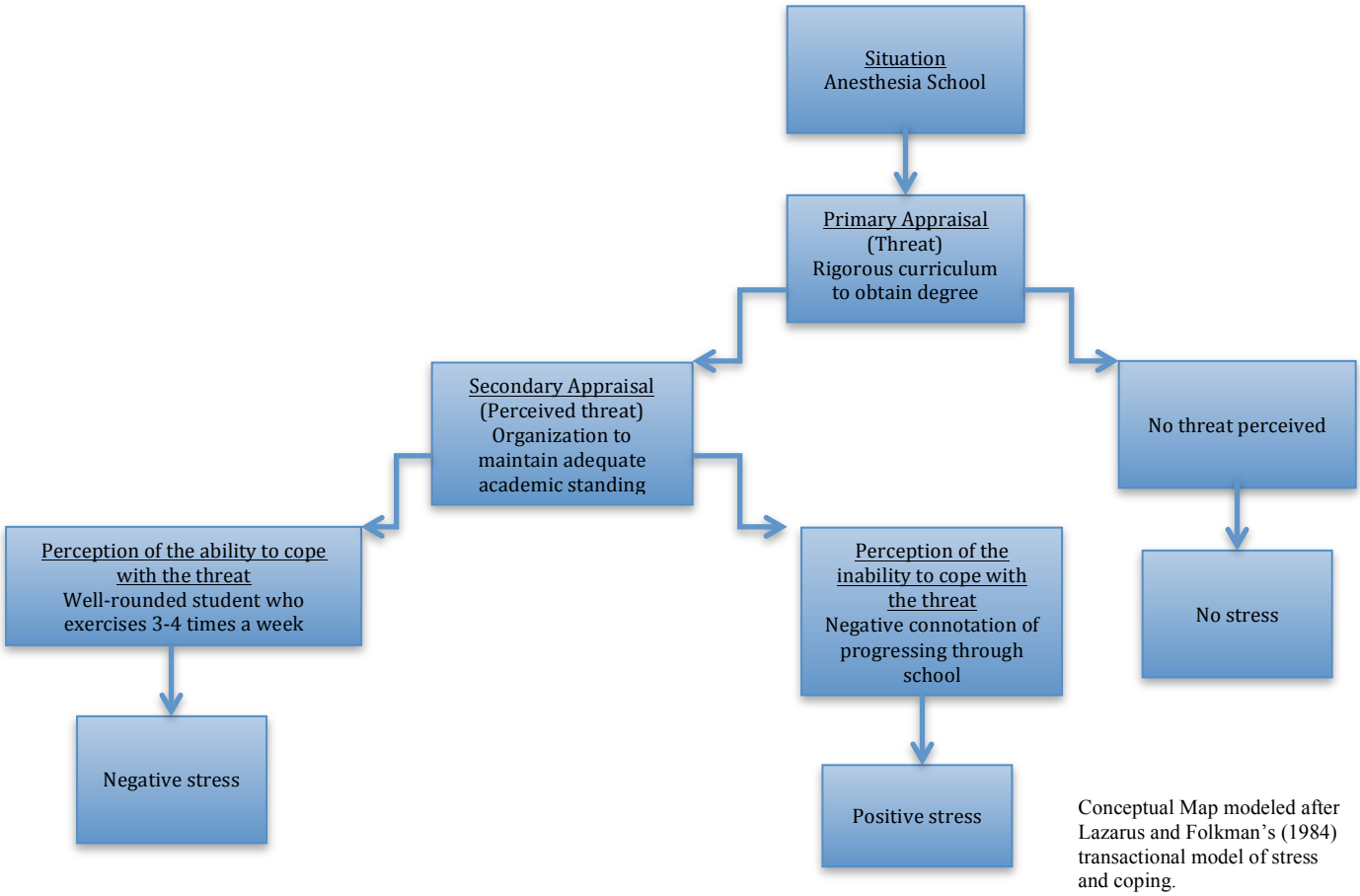

Figure 1. Conceptual Map of Stressors Among NATs

Review of Literature

The literature review was conducted using Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, and Health Source: Nursing/Academic Edition. Medical Subject Headings (MeSH) terms included "nurse, anesthesia student, and stress," "nurse, anesthesia student, and coping," "nurs*, stress*, and psychosocial," "resident, stress, education," and "nurse, anesthesia, and education." Results yielded 6-60 articles. Data collected was limited to peer-reviewed articles. Results were narrowed down by year, ranging from 2010 to present, availability of full text articles, and research completed on humans. Abstracts of articles were reviewed for relevancy with an emphasis on research related to NATs, resident physicians, and

coping mechanisms. The remaining articles accurately described stressors in NATs and residents, and various ways of coping for improved stress management. Stress is a personal experience, making it difficult to identify one stressor and solution to reduce overall stress in NATs. The data found focused on manifestations, stressors, and physical coping mechanisms of stress in the NAT.

Manifestations

Finding ways to cope is necessary to manage important life events and decrease manifestations of stress. Manifestations of stress have been categorized as behavioral, emotional, intellectual and physical. Behavioral responses to stress manifest as sleep disturbances or change in sleeping habits, muscle tension, muscle aches, gastrointestinal problems, fatigue, and anxiety. Anxiety, in particular, creates an unsettling inner emotional state of being, and is characterized by fear, apprehension, and uncertainty from anticipation (McKay, Buen, Bohan, & Maye, 2010). As manifestations of stress accumulate, NATs may be unable to cope, creating inner emotions that can present to others as abrupt and inappropriate thoughts, which may impact relationships and social outlets between NATs and other individuals.

Wildgust (1986), Chipas and McKenna (2011) and Chipas et al. (2012) concluded that agitation and irritability are the predominant emotional manifestations of stress. Additional emotional manifestations are identified as impatience and annoyance. The emotional symptoms are portrayed through words, feelings, and actions that have the ability to cause miscommunication. Resident physicians have a similar role to NATs. A study by Passalacqua & Segrin (2012) indicated that resident physicians with long call shifts manifest stress, burnout, and a decrease in empathy on patient-centered communication as the shift time progresses. The symptoms experienced included an inability to keep an empathetic capacity due to too little

sleep, too little time, and too many patients (Passalacqua & Segrin, 2012). Resident physicians and NATs manifestations of stress are similar in that developing these manifestations has the potential to lead to adverse outcomes. The ability of anesthesia residents and NATs to manage patient loads, high acuity patients, and provide adequate communication are skills that take time and experience to perform adequately on a regular basis.

Headaches were identified as the primary physical manifestation of stress. Headaches can alter the thought process and cognitive ability of the NAT. Wildgust (1986) and Chipas and McKenna (2011) identified high blood pressure as another physical manifestation of stress. Cardiac issues may arise with elevated blood pressure, which causes further systemic health problems down the road. The stress of being on-call to care for acutely ill patients as a new practitioner creates a different type of stress. Tendulkar et al. (2005) identified tachycardia and elevated white blood cell counts (WBCs) during periods of stress, specifically while on-call. The physical manifestations of stress are enhanced in less experienced residents, and decrease over time (Tendulkar et al., 2005). As residents and NATs gain more knowledge, experience, and confidence, the physical effects of stress decline. Chipas and McKenna (2011) and Chipas et al. (2012) indicated significant physical manifestations of stress included sleep disturbances and digestion problems. The discomforts that develop with stress cause a change in how NATs are able to function on a day-to-day basis.

While some manifestations of stress may be physical, they can also affect intellectual ability. Intellectual manifestations affecting NATs included having difficulty concentrating, being more forgetful, and lacking attention to detail. Errors are more likely to occur when NATs experience intellectual manifestations of stress, which creates the potential for various degrees of harm to patients. Manifestations typically disappear as stress levels decrease; however, when

these symptoms do not disappear and are present on a daily basis, they negatively affect the individual.

Stressors

The sources of stress are stressors, which are events that increase manifestations of stress. Since individual NATs handle stressors in different ways, the impact will vary. Stressors occur in multiple health care programs, including undergraduate and graduate levels of education. Academically, stress begins in the nursing profession during undergraduate education. Most students experience program related stressors due to examinations, assignments, and studies in general (Timmins, Corroon, Byrne, & Mooney, 2011). The fear of not meeting expectations and failing exams are stressors undergraduate student's face, which carries over to graduate level education. Timmins et al., (2011) identified the mental health of students was considered "good" or "very good" until senior year when clinical placements, relationships with staff members, and more critical patients were being cared for.

After admission into graduate school, curriculum stressors such as high academic expectations, class structure, personal conflicts with peers, fear of reprimand, conflict with faculty, ineffective time management, demanding clinical assignments, fatigue, and information overload occur (Phillips, 2010). Chipas and McKenna (2011) indicated additional stressors are generated when starting school such as changing or quitting jobs, or moving to a new environment.

Students' well being can be affected by various stressors in nurse anesthesia school, medical school, residency, and fellowships. Satterfield & Becerra (2010) identified developmental challenges, stressors, and coping strategies as stated in Table 1. Results provided by medical resident support groups indicated stressors were generally related to role strain.

Adapting to a new environment, responsibilities, and confidence are areas that are identified as stressors in medical residents (Satterfield & Becerra, 2010). As a provider begins taking call, their workload increases leading to physical exhaustion, sleep deprivation, and potential for emotional overload (Ratanawongsa, Wright & Carrese, 2007).

Like medical residents, NATs have role strain as they enter in to the clinical setting and attempt to develop a sense of confidence as a practitioner. Stressors may differ depending on the NAT's overall background, years of experience in nursing, and ability to manage new situations; however, the environment in the clinical setting will affect one's mental health (Haoka et al., 2010). The operating room environment is filled with individuals that depend upon one another to complete specific tasks. When NATs first enter the operating room, they risk becoming emotionally exhausted while trying to become familiar with a new environment, make the connection between classroom material and clinical practice, and learn to work as part of a team.

The mental stressors may have an impact on a NATs mental health. Elisha and Rutledge (2011) identified verbal abuse as common among NATs when in the clinical setting and causing additional stress. To counteract negativity, if the NAT or resident is able to develop a positive attitude towards the work environment, the stress level will overall be reduced (Haoka et al., 2010).

Perez and Carroll-Perez (1999) identified the most relevant stressors of NATs throughout their education, in which fear of passing the national certification exam was the largest stressor, followed by fear of clinical error, mental and physical fatigue, and lack of social and leisure activities. The ability to identify what possible stressors are at various stages throughout anesthesia school provides awareness of these critical times and events to the NAT.

Stress management is difficult for NATs, since there are multiple areas of personal and professional change when starting school. Perez and Carroll-Perez (1999) found that more than 75% of NATs had a change in finances, social activities with friends and family, and personal health habits such as exercising and sleeping patterns. The study showed NAT's had a decline in relationships with family, friends, and the ability to complete every day activities such as exercising and other personal responsibilities.

Coping Mechanisms

Early identification of stress improves academic outcomes and program efficiency, while limiting manifestations of stress (Chipas et al., 2012). Social support and stress management assistance has the ability to improve the health and coping skills of NATs, improve self-efficacy, and improve academic performance (Conner, 2015). Social support systems and peers provide words of comfort and a supportive channel for NATs to vent frustrations (Perez & Carroll-Perez, 1999). NAT peers play an important role in a NAT's ability to cope with stress, acting as a soundboard for frustrations (Perez & Carroll-Perez, 1999). Peers identify with the stress that one another are experiencing and provide advice on how to handle specific situations. The NAT's ability to learn, process information, and make correct decisions is improved when alleviating manifestations of stress.

Residents, who share similar stressors to NATs, find coping strategies to refuel their well-being are usually accomplished when away from work. Outside relationships with significant others, family, friends, and fellow residents are individuals to provide support during this stressful time (Ratanawongsa, Wright & Carrese, 2007). Although residents rely on emotional support from people outside of work, some prefer to separate work from their personal life. Residents use exercise, hobbies, and 'the end is in sight' attitude to accept a short-term pain

for long-term gain mantra (Ratanawongsa, Wright & Carrese, 2007). For residents, understanding that this is a temporary change in their daily living makes the stress of residency tolerable.

It is essential for NATs to adapt to change, and take the stress and responsibility of school on an incremental basis. This coping mechanism allows individuals to incorporate time management techniques and organizational skills (Phillips, 2010). Positive coping mechanisms, including spending time with friends and family, seeking emotional support from peers or professional sources, and religion can help to manage stress (Conner, 2015). Coping mechanisms are best utilized when using a positive outlook; however, negative coping mechanisms such as alcohol, drugs, criticizing of one-self, and giving up on coping altogether are sometimes also utilized by NATs (Conner, 2015). Early identification of the negative coping mechanisms is important to control the extent that these mechanisms are utilized.

When peers and support systems are not readily available, stress management with tools such as music, meditation, and exercise are positive individual coping mechanisms (Chipas et al., 2012). Music can include both listening and/or creating music, while meditation allows individuals to induce a different level of consciousness while clearing the mind. Exercise releases endorphins in the body creating a positive energy and overall brighter outlook on life. Methods of exercise can include anything from a walk around the block, to yoga, weight lifting, or training for a marathon. Individual coping mechanisms are essential to identify so management of stress is uniquely maintained based on the NAT's needs.

The time and energy put in to school often prevents NATs from caring for oneself physically, mentally, and emotionally. Stress occurs in everyday life, and with the added stress of school, identifying coping mechanisms and strategies to reduce stress is essential. Perez and

Carroll-Perez (2011) found that most schools did not have stress management programs, but most had an open door policy in place. Open door policies allow NATs to express concern regarding their personal and educational lives, which provides a positive coping mechanism.

With inadequate identification of stress, stressors, and coping mechanisms, schools will see a rise in attrition rates of nurse anesthesia students. Waugaman & Aron (2003) indicate that the most vulnerable time for attrition between months 12-18 of NAT's education due to integration into the clinical setting. Attrition rates for nurse anesthesia schools in 2005 were 9% (Dosch, Jarvis, & Schlosser, 2008). 35% of the students that withdrew from school did so for personal reasons. Ensuring adequate management of academic and personal stress can improve attrition rates in nurse anesthesia schools. If stress, stressors, and coping mechanisms are better managed, especially during the time sensitive period of nurse anesthesia school, overall stress levels will decrease and a lower attrition rate can be obtained.

Methods

After approval by the institutional review board of DePaul University, a multifactorial survey was distributed using the Qualtrics program. An electronic e-mail invitation was distributed to members of the Illinois Association of Nurse Anesthesia (IANA) and was distributed by Micah Roderick, Executive Director of the IANA. The invitation was sent to 1,685 CRNAs and SRNAs who had e-mail addresses on file with the IANA. Two e-mail invitations were sent, the first was sent October 1, 2015, the second December 1, 2015. The online survey remained open until January 1, 2016. 169 respondents began or completed the survey. Of the 169, four were excluded due to incomplete surveys or did not meet the inclusion criteria of being a member of the IANA and a graduate or current student of nurse anesthesia school. The final number of respondents included in the survey was 165.

The survey was a self-assessment that contained

- Demographic questions that included gender, ethnicity, age, work status marital status, marital status change, children status, and years of experience in nursing at the start of anesthesia school.
- Stressors separated into categories: work, home, health, financial, and personal/social stressors, and what stressors within these categories occurred during anesthesia school.
- Coping mechanisms performed by respondents to relieve stress throughout nurse anesthesia school.

David Anspaugh provided permission for use of the survey.

Human Subjects Protection

Training of Research Personnel on Human Subjects Protection was completed through CITI training in May 2015. The Institutional Review Board at DePaul University approved the research plan on September 30, 2015. Consent was assumed when respondents completed the survey as stated in the cover letter received with the survey. Micah Roderick, IANA Executive Director distributed the survey as a third party, ensuring confidentiality and anonymity of the respondents. Qualtrics survey did not track IP addresses, thus provided anonymity to the respondents. There was a minimal risk of this research. The survey may have triggered traumatic or stressful events during the respondent's time in nurse anesthesia school. The research did not benefit the participants, but instead was aimed at benefiting future nurse anesthetists.

Results

The survey was distributed to 1,685 IANA members, with 165 completing the survey, for a response rate of 9.7%. Four respondent's surveys were excluded from the study due to incomplete data or respondents not in the anesthesia field. Demographic questions asked about information from the start of nurse anesthesia school such as gender, ethnicity, age at the start of school, marital status at the start of anesthesia school, change in marital status, years of work experience, and if they had children before or during anesthesia school. Respondents were asked to identify stressors from five categories that occurred during nurse anesthesia school. Lastly, respondents were asked to identify coping mechanisms used during nurse anesthesia school on a scale of "often," "sometimes," or "not at all."

Overall, 35.2% of respondents were male, 64.8% females (Table 2). Respondent ethnicity was reported as primarily white or Caucasian (91.5%) (Table 3). The average respondent age reported at the start of anesthesia school was 26-30 years of age (Table 4). Respondents' years of work experience is similar (Table 5) with the most between three to five years of work experience (34.5%).

Table 2. Gender

	Frequency	Percent
Male	58	35.2
Female	107	64.8

Table 3. Ethnicity

	Frequency	Percent
White/Caucasian	151	91.5
Hispanic or Latino	1	0.6
Black or African American	4	2.4
Asian/Pacific Islander	6	3.6
Other	3	1.8

Table 4. Age at the Start of Anesthesia School

	Frequency	Percent
20-25	26	15.8
26-30	59	35.8
31-35	43	26.1

36-40	19	11.5
41 or older	18	10.9

Table 5. Years of Experience in Nursing at the Start of Anesthesia School

	Frequency	Percent
0-2	33	20
3-5	57	34.5
6-8	30	18.2
>8	45	27.3

Descriptive results on sociodemographic background

Relationships and family status is important to address in anesthesia school because of the direct impact school and family have on one another. The majority of respondents were married or in a domestic partnership during anesthesia school (64.2%). 24.8% of respondents indicated they were single or never married during anesthesia school, 10.3% were divorced, and 0.6% indicated they were separated. The respondents indicated a 13.3% change in marital status during anesthesia school. (Table 7). 35.8% of respondents had children at the start or during anesthesia school (Table 8).

Table 6. Marital Status During Anesthesia School

	Frequency	Percent
Single, never married	41	24.8
Married or domestic partnership	106	64.2
Divorced	17	10.3
Separated	1	0.6

Table 7. Marital Status Change Throughout Anesthesia School

	Frequency	Percent
Yes	22	13.3
No	142	86.1
No answer	1	0.6

Table 8. Child Status At The Start And/Or During Anesthesia School

	Frequency	Percent
Yes	59	35.8
No	106	64.2

The working status of respondents throughout school indicated the majority of respondents worked through year one of anesthesia school (36.4%), while many did not work at all (28.5%), 17.6% worked part time, 13.9% worked as needed, and a mere 3.6% worked full time (Table 9).

Table 9. Work Status Throughout Anesthesia School

	Frequency	Percent
Full time	6	3.6
Part time	29	17.6
PRN	23	13.9
Worked through year one	60	36.4
Not working	47	28.5

Descriptive Results on Stressors Experienced in Nurse Anesthesia School

Data from stressor category responses were subjective. Respondents were given a list of stressors that fell into five different categories, work, home, health, financial, and personal or social related stressors, and asked to select all that apply.

Of the 12 work-related stressors, respondents indicated a change in work hours (50.9%), as the biggest work-related stressor during anesthesia school (Table 10). In addition, a change to a new type of work (27.3%) and changes to more responsibilities at work (20%) were rated as the most common work-related stressors during anesthesia school. Respondents indicated fewer responsibilities at work (6.1%), changes involving a transfer (6.1%), and troubles with other coworkers (6.1%) occurred during anesthesia school. Respondents indicated troubles with their boss (1.2%), major business adjustments (1.2%) and troubles with persons under their supervision (1.2%) as less frequent work stressors during anesthesia school. One respondent reported a change in work involving a promotion (0.6%) as a work related stressor. Another individual reported retirement (0.6%) as a stressor during anesthesia school. No respondents indicated changes in work involving a demotion as a stressor during anesthesia school.

Table 10. Descriptive Results for Work-Related Stressors

	Frequency	Percent
Change in work hours or conditions	84	50.9
Change to a new type of work	45	27.3
Change to more responsibilities at work	33	20.0
Change to fewer responsibilities at work	10	6.1
Changes in work involving a transfer	10	6.1
Troubles at work with coworkers	10	6.1
Troubles with individual's boss	4	2.4
Troubles with major business adjustments	2	1.2
Troubles at work with persons under individual's supervision	2	1.2
Changes in work involving promotion	1	0.6
Retirement	1	0.6
Changes in work involving demotion	0	0.0

35 home-related stressors were listed for respondents. As indicated in table 11, a change in social activities (43%) and family get-togethers (37%) were rated as the most common home-related stressors. Many respondents indicate a change in living conditions (33.3%), whether to a different town, city or state (27.3%) or within the same city or town (15.2%) were home stressors experienced during anesthesia school. Even positive activities such as vacation and trip planning (18.8%) were reported to cause stress. Respondents indicated personal relationship issues such as arguments with a spouse (17.6%), boyfriend or girlfriend problems (11.5%), and separation from spouse due to divorce (3%) or marital problems (3%) as home-related stressors during anesthesia school. Respondents indicated changes in relationship status such as marriage (12.1%) or engagement to marry (9.1%) were additional stressors.

Changes in family dynamics such as a spouse beginning or ending work (11.5%), separation from spouse due to work (7.3%), sexual difficulties (9.1%), changes in health or behavior of a family member (9.1%), pregnancy (9.1%), miscarriage or abortion (4.2%), adoption of a child (0.6%), children leaving to attend college (2.4%), or a family member moving in (1.8%) caused stress during anesthesia school (Table 11). Respondents indicated

home stress with in-laws (4.8%), death of a parent (6.7%), and death of a sibling (0.6%) as home-related stressors during anesthesia school. The least commonly reported stressors indicated by respondents were a change in marital status of parents through remarriage (1.2%) and a change in one's own political beliefs (0.6%). Stressors that were listed on the survey but yielded no responses included a change in religious beliefs, a child leaving the house to marry or for other reasons, change of parent's marital status through divorce, birth of a grandchild, death of a spouse, and death of a child.

Table 11. Descriptive Results for Home-Related Stressors

	Frequency	Percent
Change in social activities	71	43.0
Change in family get-togethers	61	37.0
Major change in living conditions	55	33.3
Change in residence to a different town/city/state	45	27.3
Vacation/trip	31	18.8
Change in arguments with spouse	29	17.6
Change in residence within the same city/town	25	15.2
New close personal relationship	22	13.3
Marriage	20	12.1
Girlfriend or boyfriend problems	19	11.5
Spouse beginning or ending work	19	11.5
Pregnancy	15	9.1
Engagement to marry	15	9.1
Change in health or behavior of family member	15	9.1
Sexual difficulties	15	9.1
Birth of a child	13	7.9
Separation of spouse due to work	12	7.3
Death of a parent	11	6.7
In-law problems	8	4.8
Miscarriage or abortion	7	4.2
Change of school or college	7	4.2
Separation from spouse due to divorce	5	3.0
Separation from spouse due to marital problems	5	3.0
Child leaving to attend college	4	2.4
Addition of a family member moving in	3	1.8
Change in marital status of parents through remarriage	2	1.2
Addition of a family member by adoption of a child	1	0.6
Death of a brother or sister	1	0.6

Change in political beliefs	1	0.6
Change in religious beliefs	0	0
Child leaving the house to marry or for other reasons	0	0
Change of parents marital status through divorce	0	0
Birth of a grandchild	0	0
Death of a spouse	0	0
Death of a child	0	0

Six health-related stressors were surveyed. Respondents indicated a major change in usual type or amount of recreation (69.7%) was the biggest stressor during anesthesia school (Table 12). In addition, many respondents indicated a major change in sleeping (52.1%) and eating (33.9%) present during anesthesia school. 18.2% of respondents indicated they suffered from a short term illness that did not require long-term bed rest or hospitalization (18.2%) and injury or illness that required longer than a week in bed or hospital stay (3.5%). Two respondents indicated major dental work (1.2%) as health-related stressors during anesthesia school.

Table 12. Descriptive Results for Health-Related Stressors

	Frequency	Percent
Major change in usual type or amount of recreation	115	69.7
Major change in sleeping habits	86	52.1
Major change in eating habits	56	33.9
An injury or illness that did not require long bed rest of hospitalization	30	18.2
An injury or illness that kept individual in bed a week or more or sent individual to the hospital	6	3.6
Major dental work	2	1.2

Of the 11 financial stressors listed, respondents indicated that a decrease in income was the largest financial stressor in nurse anesthesia school (78.8%) (Table 13). Over the course of school, 7.3% of respondents indicated a moderate purchase and 7.3% indicated a major purchase as stressors during anesthesia school. A change in personal relationships accounted for 7.3% of

respondents stressors. 6.7% of respondents experienced investments or credit difficulties. 3.6% of respondents indicated loss or damage to personal property occurred. 2.4% of respondents experienced loss of a job affecting finances, being laid off from work (0.6%), or being fired from work (0.6%) as financial stressors. 1.8% experienced an accident causing financial stressors during nurse anesthesia school. 1.2% of respondents indicated an increase in income. Although some of the stressors experienced were experienced by a small number of respondents, they are still significant for those that experienced the stressors.

Table 13. Descriptive Results for Financial Stressors

	Frequency	Percent
Major changes in finance through decreased income	130	78.8
Moderate purchase	12	7.3
Major purchase	12	7.3
"Falling out" of a close personal relationship	12	7.3
Major changes in finance through investment or credit difficulties	11	6.7
Loss or damage of personal property	6	3.6
Loss of job due to correspondence course to help you in your work	4	2.4
Accident	3	1.8
Major changes in finance through increased income	2	1.2
Loss of job due to being laid off from work	1	0.6
Loss of job due to being fired from work	1	0.6

Eight personal and social stressors were surveyed. Respondents indicated the largest amount of personal and social stress stemmed from a change in personal habits (47.9%), beginning or ending school (41.2%), making a major decision about the immediate future (41.2%), and a major personal achievement (30.9%) (Table 14). A small number of respondents indicated a minor violation of the law (1.8%), death of a close friend (1.8%), and foreclosure on a mortgage or loan (1.2%) as personal or social stressors experienced in nurse anesthesia school. Fortunately, zero respondents indicated they experienced the stressor of going to jail during nurse anesthesia school.

Table 14. Descriptive Results for Personal/Social Stressors

	Frequency	Percent
Change in personal habits	79	47.9
Beginning or ending school or college	68	41.2
Major decision about your immediate future	68	41.2
Major personal achievement	51	30.9
Minor violation of the law	3	1.8
Death of a close friend	3	1.8
Foreclosure on a mortgage or loan	2	1.2
Jail	0	0.0

Descriptive Results for Coping Mechanisms Implemented by NATs During School

Descriptive results on coping mechanisms by respondents were completed using 40 different coping mechanisms. Respondents were asked to rate how often they participated in the coping mechanisms: often (1), rarely (2) or not at all (3) (Table 15). Each activity has a minimum score of 1 and a maximum score of 3. This survey was completed using reverse coding; therefore the lower the sum the more an individual took part in the activity. The lowest score possible is 166 if all respondents answered 1 (often); the largest score is 498 if all participants answered 3 (not at all). The lowest sum was 218, which translated to many respondents often taking a bath or shower to cope with stress. The highest sum was 477, which translated to respondents rarely writing prose or poetry to cope with stress. The lowest mean was 1.34 (SD .611) for respondents taking a bath, which indicated the average, correlated with "often." The largest mean was 2.91 (SD .310) for individuals writing prose or poetry, which indicated the average correlated with "not at all." The Cronbach's alpha for this portion of the survey is 0.842; therefore the survey is reliable and indicates that there is internal consistency of the respondents' responses to the items in the online survey.

Positive and negative coping mechanisms were surveyed. The most used coping mechanism in respondents was taking a shower or bath (mean- 1.34, SD- .611) (Table 14).

Respondents indicated they often discussed situations with spouses or close friends (mean- 1.34, SD- .592), listened to music (mean- 1.40, SD- .550), and changed eating habits (mean-1.70, SD- .813).

The reverse coding used indicated least used coping mechanisms respondents correlated with a higher sum. Respondents rarely used writing prose or poetry as coping mechanism throughout anesthesia school (mean- 2.91, SD- .310). Another rarely used coping mechanisms identified was taking a tranquilizing drug (mean- 2.86, SD- .394). Additional results for coping mechanisms by respondents are identified in Table 15.

There was a qualitative "other" component to this part of the survey. Respondents were asked to provide any coping mechanisms that were NOT included in the survey, as well as any additional comments. This data included phrases such as "drink moderately," "drink cocktails," "dine out," "kind of misleading because some of these activities are stress-inducing, not used for coping," "gambling," "attending worship services," "crying," and "go to AA meetings."

Table 15. Descriptive Results on Coping Mechanisms Implemented by NATs During School

	Sum	Mean	Std. Deviation
Take a bath or shower	218	1.34	.611
Discuss situations with a spouse or close friends	219	1.34	.592
Listen to music	231	1.40	.550
Eat too much or too little, drink a lot of coffee	274	1.70	.813
Go for a walk or drive	283	1.73	.658
Swear	288	1.78	.722
Drink excessive amounts of coffee or tea	287	1.79	.855
Exercise (Swim, bike, job, etc.)	297	1.81	.661
Watch television, go to a movie	299	1.81	.559
Overeat or under eat	296	1.85	.818
Become irritable or short tempered	300	1.85	.716
Get outdoors, enjoy nature	307	1.86	.624
Take a nap	310	1.91	.682
Read a newspaper, magazine, or book	318	1.93	.720
Straighten up your desk or work area	323	1.98	.757
Try to anticipate the worst possible outcomes	326	2.01	.731
Go shopping	337	2.04	.567

Sit alone in the peaceful outdoors	348	2.11	.672
Play with a pet	345	2.12	.834
Pray, go to church	349	2.13	.761
Buy something (records, books)	361	2.21	.636
Do physical labor (garden, paint)	365	2.24	.665
Get drunk	368	2.26	.690
Yell at a spouse or close friends	367	2.29	.660
Use negative self-talk	374	2.34	.708
Get deeply involved in some other activity	398	2.41	.634
Attend an athletic event	396	2.41	.596
Avoid social contact with others	392	2.43	.630
Drive fast in your car	395	2.44	.747
Become aggressive	398	2.46	.636
Play a game (chess, backgammon, video games)	399	2.52	.602
Cry excessively	408	2.52	.652
Make home repairs or refinish furniture	419	2.57	.566
Chew fingernails	421	2.60	.673
Practice deep breathing, meditation, autogenic, or muscle relaxation	429	2.62	.621
Smoke tobacco	425	2.66	.645
Kick something or throw something	438	2.70	.556
Write in a journal	462	2.82	.403
Think about suicide	462	2.85	.390
Take a tranquilizing drug	464	2.86	.394
Write prose or poetry	477	2.91	.310

** Each activity has a minimum score of 1 and a maximum score of 3. This survey was completed using reverse coding; therefore the lower the sum the more an individual took part in the activity. The lowest score possible is 166 if all respondents answered 1 (often); the largest score is 498 if all participants answered 3 (not at all).

Sociodemographic Variables on Coping Mechanisms to Relieve Stress

Coping mechanisms used to relieve stress were analyzed using the independent sample T-test with respect to gender, marital status, and child status throughout nurse anesthesia school. There was no statistically significant difference in coping mechanisms used between any of the independent groups; all p values were >0.5 significance level (Table 16).

Table 16. Comparison of Means of Two Independent Groups using T-Test

	T test values	df	P value
Gender (m vs. f)	.902	134	**.369**
Marital status	.763	134	**.447**

(single vs. married)			
Did the SRNA have kids while/during school (yes vs. no)	-1.529	134	**.129**

An analysis of variance (ANOVA) was completed to compare the coping mechanisms of respondents to their age and subgroupings according to years of experience at the start of nurse anesthesia school (Table 17). The ANOVA revealed that there were no statistically significant differences in coping mechanisms by subgroupings according to age or experience at the start of nurse anesthesia school; all p values were above the >0.05 significance level. The study sample was homogenous with respect to ethnicity, so no tests were performed for this variable. The Cronbach's alpha for the online survey tool was 0.842 indicating good reliability of the modified instrument used for this study.

Table 17. Analysis of Variance Comparing Means of Three or More Independent Groups

ANOVA			
Coping Mechanisms Implemented by NATs During School			
	Df	F	Sig. P Value
Age at the start of school			
Between Groups	4	2.121	**.082**
Within Groups	131		
Years of experience			
Between Groups	3	1.099	**.352**
Within Groups	132		

Discussion

The adeptness with which individuals cope with stress requires the ability to identify stressors, manifestations, and coping mechanisms that are successful in managing stress. If individuals are unable to identify one of these components, the amount of stress one endures is likely to increase affecting learning and the ability to handle new situations such as nurse anesthesia school. NATs experience stress in areas such as academics and clinical

performance in addition to every day stressors. Data from this study was used to identify manifestations and stressors experienced during anesthesia school, and coping mechanisms used by NATs use during anesthesia school. The study also tested for correlation between student demographics and coping mechanisms with no statistically significant result.

The study showed that of the five categories of stressors, respondents indicated a decrease in income (78.7%) and a change in work hours (50.9%) as the largest stressors (Tables 10 & 12). Demographically, 36.4% of respondents reported working through the first year and 28.5% did not work at all throughout nurse anesthesia school (Table 9). Between a change in work hours and the addition of tuition to financial responsibilities, the previous financial status of the individual is compromised. It is imperative for individuals to assess their financial status and understand the options available for them to work through this financially difficult time prior to the start of nurse anesthesia school, and to continue to assess throughout their education. An understanding of the financial sacrifices necessary during this time has the potential to immensely decrease this stressor.

Most respondents were 26-30 years of age at the start of nurse anesthesia school (Table 4) with three to five years of nursing experience (Table 5). Traditionally, individuals are becoming well established socially, financially, and professionally during this time, so the major changes encountered during anesthesia school can be significant stressors. Stressors endured while in the clinical and classroom settings trigger enhanced stress in everyday life, such as a change in sleep habits (52.1%), personal habits (47.9%), social activities (43%), and recreation (69.7%) (Tables 11, 12, and 14). The change in sleep and personal habits, social activities, and recreation affects one's ability to cope with stress. Respondents indicated that personal habits such as taking a bath or shower, communication with a spouse or friend, various forms of

exercise, and recreational activities were the most commonly used coping mechanisms used by NATs during nurse anesthesia school (Table 15). With the activities that might offer stress relief also being rated as changing the most during anesthesia school, it is not surprising that stress levels skyrocket, leaving little time for students to maintain their mental, physical, and emotional health.

Personal relationships of respondents indicated marriage (12.1%), engagements (9.1%), separation due to work (7.3%), problems (3%), and divorce (3%)) as accounting for the largest amount of home-related stress (Table 11). Demographic results indicated 13.3% of respondents had a marital status change in nurse anesthesia school (Table 7). Of the respondents, 75.2% (Table 6) indicated they were married or in a domestic partnership, divorced, or separated during nurse anesthesia school. Personal relationships require commitment, and are imperative to maintain support by relationships throughout nurse anesthesia school. The commitment of nurse anesthesia school has the potential to impact personal relationships, which adds additional stress to the NAT.

This study did not yield statistically significant results by NATs, however it did provide valuable information on the manifestations of stress, the most commonly encountered stressors, and effective coping mechanisms that were used during anesthesia school. The valuable data gained from this study helped in the development of an educational seminar that could enhance the learning capacity of future NATs who experience stress during anesthesia school. The research from this study provides individuals with a resource of what stressors may be present during nurse anesthesia school, and coping mechanisms that have been used in the past by former NATs.

Educational Seminar

With the information gained from the review of literature and the results of this research, an educational seminar was developed to provide new NATs with background information on manifestations of stress, stressors, and coping mechanisms that have been effectively used by former NATs in the past. The importance of educating future NATs at the start of their education on negative effects that stress can have on the body both physically and mentally will hopefully provide these individuals with tools to lessen the stress level and improve learning.

The educational seminar will provide schools and future NATs with brief, succinct, information on manifestations to look for, the effects of stress, and coping mechanisms to improve stress levels and quality of learning throughout nurse anesthesia school.

Limitations

Limitations to this study included a smaller population size. The population was limited to IANA members, of which under 9.7% of potential respondents participated. Respondent's ethnicity was determined, but this statistic was unable to be compared to that of the IANA population. If ethnicity demographic information were compared to that of the IANA, it would provide potential significance for the ethnicity statistics.

Further analysis correlating demographic data to stressors experienced could have been completed. This would provide information on specific demographic groups that experienced specific stressors. An example of this would be if married NATs experienced more home-related stressors than single NATs. In addition, further analysis would have been beneficial comparing individual stressors identified to coping mechanisms that were most effective to alleviate the stressor. An example of this is would be NATs who experienced a change in social activities would alleviate this stress in what ways? Although a large quantity of data was collected in this

study, the data could be simplified and integrated into stressors more pronounced in NATs versus using a non-targeted survey.

Recommendations

A future recommendation for research is to isolate stress to specific areas of nurse anesthesia school. The identification of specific anesthesia school-related stressors with the corresponding effective coping mechanisms may provide a better learning environment and improved education received by NATs.

Another future recommendation is to test the educational seminar to identify the effectiveness of the seminar. This would entail a pre-survey for NATs to identify their knowledge on the topic, presenting the educational seminar, and completing a post-survey on the effectiveness of the tool. This tool was created to educate new NATs on the importance of identifying stress and knowledge on stressors, manifestations of stress, and coping mechanisms that have been successful by former NATs. The goal of the educational seminar is to have NATs integrate this knowledge into their daily regimen during nurse anesthesia school to identify when they are stressed, how it is being exhibited, and what is effective to reduce or alleviate the stress before it is unmanageable and affects their personal and educational lives.

Conclusion

Respondents indicated a decrease in financial income, a change in recreational activities, sleeping and eating habits were the most prominent stressors encountered in nurse anesthesia school. Managing and coping with these known stressors decreased the ability to concentrate, comprehend, and learn material. Awareness of the importance of identifying manifestations of stress, stressors, and coping mechanisms may lead to an increased ability to concentrate, comprehend, and learn material.

The addition of an educational seminar for future NATs on this topic will provide these individuals with tools to recognize manifestations of stress, stressors, and coping mechanisms to reduce the overall stress level while in nurse anesthesia school.

Appendix A: Survey

Part I: Demographic information
Directions: Fill out the following survey according to your background information.

1. Are you a graduate of a nurse anesthesia school and CRNA? If the answer is yes, please continue.
   A. Yes
   B. No
2. Gender
   A. Male
   B. Female
3. Age at the start of anesthesia school
   A. 20-25
   B. 26-30
   C. 31-35
   D. 36-40
   E. 41 or older
4. Ethnicity
   A. White
   B. Hispanic or Latino
   C. Black or African American
   D. Native American or American Indian
   E. Asian/ Pacific Islander
   F. Other
5. Work status throughout anesthesia school
   A. Full time
   B. Part time
   C. PRN
   D. Worked through year one
   E. Not working
6. Marital status during anesthesia school
   A. Single, never married
   B. Married or domestic partnership
   C. Widowed
   D. Divorced
   E. Separated
7. Did your marital status change throughout anesthesia school?
   A. Yes
   B. No
8. Did you have children at the start and/or during anesthesia school?
   A. Yes
   B. No
9. Years of experience in nursing at the start of anesthesia school
   A. 0-2
   B. 3-5
   C. 6-8
   D. >8

Part II: Identifying Life Stressors

Directions: The next 5 sections ask you to identify the stress points listed below that you experienced while in nurse anesthesia school. Select all that apply.

Health		43. Change of school or college	
An injury or illness that:		44. Change in political beliefs	
8. Kept you in bed a week or more or sent you to the hospital		45. Change in religious beliefs	
9. Did not require long bed rest or hospitalization		46. Change in social activities	
		47. Vacation trip	
10. Major dental work		48. New close personal relationship	
11. Major change in eating habits		49. Engagement to marry	
12. Major change in sleeping habits		50. Girlfriend or boyfriend problems	
13. Major change in your unusual type or amount of recreation		51. Sexual difficulties	
Work			
14. Change to a new type of work		Child leaving home	
15. Change in your work hours or conditions		52. To attend college	
		53. To marry	
Change in your responsibilities at work		54. For other reasons	
16. To more responsibilities			
17. To fewer responsibilities		Change in the marital status of your parents	
Home		55. Through divorce	
18. Major change in living conditions		56. Through remarriage	
Change in residence		57. Change in arguments with spouse	
19. Within the same town/city		58. In-law problems	
20. To a different town/city/state			
		Separation from spouse	
21. Change in family get-togethers		59. Due to work	
22. Major change in health or behavior of family member		60. Due to marital problems	
23. Marriage			
24. Pregnancy		61. Divorce	
25. Miscarriage or abortion		62. Birth of grandchild	
		63. Death of spouse	
Addition of a new family member			
26. Through birth of a child		Death of	
27. Through adoption of a child		64. Child	
28. Through a relative moving in		65. Brother or sister	
29. Spouse beginning or ending work		66. Parent	
Changes at work involving		**Financial**	
30. Promotion		Major changes in finances	
31. Demotion		67. Through increased income	
32. Transfer		68. Through decreased income	
		69. Through investment or credit difficulties	
Troubles at work			
33. With your boss		70. Loss or damage of personal property	
34. With your coworkers		71. Moderate purchase	
35. With persons under your supervision		72. Major purchase	
36. Major business adjustment		73. "Falling out" of a close personal relationship	
37. Retirement		74. Accident	
		75. Minor violation of the law	

Loss of job		76. Being held in jail	
38. Due to being laid off from work		77. Death of a close friend	
39. Due to being fired from work		78. Major decision about your immediate future	
40. Correspondence course to help you in your work		79. Major personal achievement	
Personal and Social		80. Foreclosure on a mortgage or loan	
41. Change in personal habits			
42. Beginning or ending school or college			

Part III: How did you cope with stress during nurse anesthesia school?
Directions: Click on the applicable activities on how you dealt with stress in nurse anesthesia school, and how often you found yourself carrying out the activities- often, rarely, or not at all.

How do you cope with stress?			
Click on your response:	Often	Rarely	Not at All
81. Listen to music			
82. Go Shopping			
83. Watch television, go to a movie			
84. Read a newspaper, magazine, or book			
85. Sit alone in the peaceful outdoors			
86. Write prose or poetry			
87. Attend an athletic event			
88. Go for a walk or drive			
89. Exercise (swim, bike, jog, etc.)			
90. Get deeply involved in some other activity			
91. Play with a pet			
92. Take a nap			
93. Get outdoors, enjoy nature			
94. Write in a journal			
95. Practice deep breathing, meditations, autogenic, or muscle relaxation			
96. Straighten up your desk or work area			
97. Take a bath or shower			
98. Do physical labor (garden, paint)			
99. Make home repairs or refinish furniture			
100. Buy something (records, books)			
101. Play a game (chess, backgammon, video games)			
102. Pray, go to church			
103. Discuss situations with a spouse or close friends			
104. Other:			
105. Become aggressive			
106. Use negative self-talk			
107. Yell at spouse, kids, or friends			
108. Drink a lot of coffee or tea			
109. Get drunk			
110. Swear			
111. Take a tranquilizing drug			
112. Avoid social contact with others			
113. Try to anticipate the worst possible outcomes			
114. Think about suicide			
115. Smoke tobacco			
116. Eat too much or too little, drink a lot of coffee			
117. Chew fingernails			
118. Overeat or under eat			
119. Become irritable or short tempered			
120. Cry excessively			
121. Kick something or throw something			
122. Drive fast in your car			
123. Other:			

Table 1. Synthesis of Stress Levels and Coping Strategies

Study	Purpose of the Study, Design, and Sampling	Human Subject Issue and Extraneous Variables, Diagnostic Tools, and Outcome Measurement Used	Limitations of the Study	Findings
Chipas et al. (2012)	The purpose of the study is to determine the differences between stressors in students in front-loaded vs. integrative education programs, differences in stress of students throughout the entire nurse anesthesia program, and to obtain suggestions from students how the AANA can help manage stress. The design consisted of a qualitative, cross-sectional study included practicing CRNAs and SRNAs. The study focused mainly on SRNAs- 1,374 students responded out of 5,365 (25.6% response rate). Demographics,	IRB approval was obtained from the Medical University of South Carolina. Students were asked what type of program they were enrolled in (front loaded, integrated, etc.). A 10-point Likert scale was used to assess stress. Stress was separated among demographic information including gender, marital status, race or ethnicity, age, and front loaded vs. integrative programs.	Limitations of this study related to the topic of stress. Stress is highly subjective and difficult to construct and assess appropriately. Only the person responding knows how stressed they are, are not, and why.	Overall stress level was a 7.2/10 Likert type scale for all SRNAs. Female students have statistically higher stress level (7.6) than male students (7.1) (t=9.47, P = <.05) Divorced students with or without children have significantly higher mean level of stress when compared to other civil status. African American and Hispanics students have higher perceived level of stress than in White/non-Hispanic students (t=11.81 and 1060, P = .01) Level of stress in students enrolled in integrated program is significantly higher than those in front loaded

	experiences of stress, and how the wellness initiative of the AANA could aid to decrease stress were collected from December 1, 2010- December 31, 2010.			program (7.9 vs. 7.1; t = -2.42, P < .05). Students who admitted depression had a statistically significant level of suicidal ideation (t = -11.81, P < 0.1. Meditating, seeing a psychiatric healthcare professional and exercise were the top three coping mechanisms of SRNAs. Thirteen major themes or suggestions were made by SRNAs to AANA to help the students cope with stress.
Chipas & McKenna (2011)	The purpose of this study was to determine current level of stress and the physical manifestations in CRNAs and SRNAs. This is a descriptive study only. Data was collected between February and May 2008. 7,537 CRNAs and SRNAs responded out of 28,000 (26.9% response rate).	Approval for a multifactorial questionnaire was obtained from University of South Carolina's Medical University IRB. Information for the questionnaire included demographic questions, manifestations of stress, and suggestions for how the AANA Wellness Program could decrease stress. The questionnaire used	N/A	The survey identified individuals stress by their primary roles. The average stress day to day was 4.7/10 from CRNAs and 7.2/10 among students. 48% of CRNAs associated stress with work. 67% of students associated stress with work (school). Stress was noted to be both positive and negative.

		a 10-point Likert scale to rate their stress on an average day.		Symptoms of stress were identified- agitation, impatient, cravings, teeth grinding, HTN, headache, inability to concentrate are examples.
Conner (2015)	The purpose of this literature review was to review data related to self-efficacy, stress, and social support and their relationship to the attrition rate of student registered nurse anesthetists.	This literature review did not affect human subjects. Outcome measurements used included attrition rate and retention of SRNAs academic performance.	N/A	After addressing admission criteria and self-efficacy, it is inconclusive if there is a correlation between self-efficacy and retention rate. Studies on SRNAs academic self-efficacy and retention in the nurse anesthesia program are warranted.
Dosch, Jarvis, & Schlosser (2008)	The purpose of this descriptive study was to survey nurse anesthesia educational program directors in the United states to determine the attrition rate of each program for the cohort graduating in 2005. The survey was sent to 101 nurse anesthesia educational programs. Eight programs were	IRB approval was obtained. A 20-item survey was developed, and the instrument was validated. Survey Monkey constructed and distributed the survey, collected results, sent reminders, and exported data.	Limitations of this study included a lower response rate than previously documented. These findings might be affected. The attrition rate and reason may be different with a higher response rate.	Directors reported 1,499 students were enrolled in the 2005 cohort, and of these, 135 (9%) did not graduate, the remaining 1,364 (91%) graduated. Twenty-one of 62 programs (33.9%) had a 0% attrition rate, 29 (47%) reported less than 5%, and 44 (71%) reported less than 10% attrition rate. Resignation was the largest

	excluded because they had no graduates. Of the 93 programs, 62 (67%) responded, 2 declined, and 29 did not respond.			mechanism of attrition (48/135), followed by dismissal for academic reasons (41/135).
Elisha & Rutledge (2011)	The purpose of the study was to describe the experiences and attitudes of SRNAs during clinical education. A descriptive study was completed using a cross-sectional survey. A total of 2,673 SRNAs were invited to participate, 696 completed the survey (26% response rate).	Approval from the California State University at Fullerton IRB was completed. SRNAs from the AANA were randomly selected. Sections of the survey included demographic information, frequency of specific experiences, level of helpfulness of activities or persons during clinical experience, level of importance of CRNA characteristics, and satisfaction with learning objectives. The end of the survey had open-ended questions. Perceptions were recorded.	Limitations of the study include the use of self-report survey and there was no validation of reported experiences could be obtained. The survey was not tested for stability, although SRNAs did not have a concern responding to the items.	Results indicated two-thirds of respondents were female. Most students were in the first two years of education, predominately white, and younger than 38 years old. The average hours of clinical experience were 31-34 hours each week. Verbal abuse was reported more frequently than sexual harassment, physical abuse, or racial discrimination. 69% of students identified verbal abuse. 9% of indicated frequent abuse while 60% reported infrequent abuse. Education experiences by gender were not significant. Females were more likely to be sexually harassed

				than men. Areas that improved learning included CRNA preceptors, unique cases, reading, and clinical lectures. Least helpful learning techniques were grand rounds, surgeons, and anesthesiology residents. Satisfaction of education objectives was more than moderately satisfied.

Haoka et al. (2010)	This cross sectional study was designed to investigate medical residents' correlation between working conditions and their ability to cope with stress. Sampling included 549 first year medical residents at 38 postgraduate education hospitals in Japan. 38.7% of the sampling replied.	The Human Ethics Committee of Tsukuba University approved all procedures and all participants provided written informed consent. A self-administered questionnaire was distributed to residents in Japan 1-2 months after starting their clinical training. It used the Sense of Coherence scale, the Brief Scales of Job Stress, and General Health Questionnaires.	Limitations include the inability to determine the causal relationship between ability to cope with stress and job-related stress factors. Sampling bias occurred with minimal response from the possible sample. Only first year residents were evaluated and do not represent all residents in Japan.	Mental health of residents was associated with working conditions in addition to their attitude toward the work environment. Independent variables include workload, mental workload, personal relationships, reward from work, and sleep time.
Kendrick (2000)	The purpose of the study was to compare and contrast stress levels between CRNAs and SRNAs by academic year in school. Communication was also assessed for lowering stress levels. 66 SRNAs and 15 CRNAs participated in the study. A descriptive	An Occupation Stress inventory test (OSI) was used to measure stress. An Occupational Role Questionnaire (ORQ) was used, Personal Strain Questionnaire (PSQ), and Personal Resource Questionnaire (PRQ). In addition, the Strength Deployment Inventory was also used and	A limitation of the study is lack of IRB approval.	Results indicated first year students scored highest on the ICI, followed by the CRNA group. The ORQ had highest stress levels from second year students and affected communication. PRQ, PSQ, and SDI were not statistically significant. Students with

	correlational design using survey methodology was used.	Interpersonal Communication Inventory (ICI). Students in a classroom setting were surveyed. CRNAs employed at a university hospital in Alabama were surveyed. No IRB approval was obtained.		high levels of stress communicate less effectively. Overall results showed: second year students have the greatest amount of stress and CRNAs have more coping resources than SRNAs.
McKay, Buen, Bohan, & Maye (2010)	The purpose is to determine the relationship between physiologic measures of stress and performance of student nurse anesthetists during anesthesia simulator training. A prospective descriptive design was completed using convenience sampling from class of 2009. 18 students participated from a nurse anesthesia program; 15 men and 3 women were the final sample size.	IRB approval was granted. Students at Uniformed Services University class of 2009 were included; students with gingival bleeding or taking adrenergic agonist or antagonist properties were asked to not volunteer. Low carbohydrate meals and caffeine, nicotine products avoided. Informed consent was obtained and data from each individual. Salivary amylase levels were measured before, right after, and 20 min. after simulation. Heart rate, blood pressure, and presence/absence of sweat were recorded post simulation.	A limitation of the study is a small sample size for the ANOVA. Objective checklists-validity and reliability have not been established. Lastly, simulator training may affect individuals differently than real life scenarios causing a false positive or negative.	A statistically significant difference in physiologic measures of stress was detected between baseline and acute levels of salivary amylase, heart rate, and anxiety levels. No significant differences were found when measures of stress were compared with performance of low, middle, or high performers.

		Subjects were placed in high, middle, and low performer groups.		
Passalacqua & Segrin (2012)	The purpose of this study was to determine whether residents' empathy declines over the course of a long-call shift. The sample consisted of 93 physicians from an internal medicine program in the Southwest that rotate to three different hospitals.	Surveys were provided to residents before and after their long-call shifts ranging from 24-30 hours. Residents were compensated with a $10 gift card of their choice after each assessment. Stress was measured using the Perceived Stress Likert-Scale was used. Burnout was determined using Maslach's Burnout Inventory. State Empathy was assessed using an adaption of Tsang and Stanford's empathy scale. Adapting Wanzer, Booth-Butterfield, and Gruber's 12-item scale assessed patient-centered	Burnout, state empathy, stress, and patient centered communication all interact. This study limits the interaction to burnout may affect empathy, but empathy may affect burnout and feed into one another.	Empathy declined during a long-hour call shift. This is due to too little sleep, too little time, and too many patients. Burnout is a response to extended occupational stress such as long-call shifts, and higher burnout decreases empathy during long-call shifts. Stress of too many patients increases burnout and empathy.

		communication.		
Perez & Carroll-Perez (1999)	The purpose of the study was to determine the perception of students' stress in nurse anesthesia programs. The study also examined the presence and use of stress management programs and open door policies at nurse anesthesia schools. A questionnaire through a qualitative study was used to sample all nurse anesthesia students in the United States-1,504/2,300 responded.	A cover letter was provided with the questionnaire mailed to students describing the nature and purpose of the study; consent was implied with return of the questionnaire. The questionnaire was reviewed and approved by the faculty at Charity hospital/Xavier University School of Nurse Anesthesiology. IRB approval was not required by the facility. Demographics, use and availability of stress management programs and effectiveness of an open-door policy were addressed, stressors related to anesthesia school, and coping strategies.	A limitation was this was a broad study; a more focused study focusing on more specific topics could be completed.	Results showed most schools did not have a stress management program; of those that did only 7.9% used them. Open door policy results show 86% of people have this amenity, but only 55% utilize this policy. Crisis was divided in to mild life crisis (1%), moderate life crisis (26%), and major life crisis (73%). Stress was highest for anticipation of successful completion of the national certification exam among 2-3rd year students. Fear of clinical error was first year stressors.
Phillips (2010)	The purpose of the study was to examine the challenges anesthesia schools and how recent graduates coped with stress during their program. A Qualitative perspective study	IRB approval from Waldron University and written permission was obtained. Data accuracy was obtained with researcher transcribing verbatim interviews and sent the	Despite honest attempts at truthfulness, consistency, and accuracy, participants may have issues with total recall of past experiences.	Results indicate participants' experiences with school were very different both physically and emotionally. Stress response was also different. A 3-stage framework was

	was performed with grounded theory methodology. 12 recent graduates from 5 different nurse anesthesia programs were sampled who have been out of school less than 2 years.	transcripts to each participant for accuracy. Coding was applied for each stressor type.	Limitations include sample size, face-to-face interaction, and due to personal feelings not all stressors were shared.	developed. A variety of coping methods were identified to adapt to the stress experienced. Stressors and adaptations or coping methods were identified. Recommendations were made.
Ratanawongsa, Wright, & Carrese (2007)	The purpose of this study was to understand resident's perspectives on well-being. Qualitative methodology and random sampling was used to complete this study. 26 out of 59 (53%) participants were interviewed.	45-minute interviews were conducted until thematic information occurred, editing was completed, and coding templates developed to identify the information. Recruitment letters and emails were provided emphasizing the confidential and voluntary nature, in addition to a $50 Amazon gift certificate.	Limitations of this study included having to minimize participants due to the nature of the qualitative study, so the results may not be applicable to other programs. With a 53% participation rate, those that declined participation may have a different view. This study was also conducted at the end of the year when levels of well-being may be different than other times of the year.	Six themes emerged: balance among multiple domains, professional development and temporary imbalance, professional satisfaction and accomplishment, maintaining a sense of self, stressors and coping strategies, and the role of residency programs. Most described residency as a tie for temporary imbalance and investing in professional development at the expense of these other domains.

Satterfield & Becerra (2010)	The purpose of this study is to determine and validate the primary developmental challenges, stressors, emotions, and broad ways of coping experienced by residents. This is mixed-methods, longitudinal examination of medical resident support groups. Grounded theory was also used. Sampling included 62 residents over two years.	IRB approval was obtained and all ethical guidelines for subject protection were followed. Attendance was voluntary and had a 100% participation from residents approached for evaluation. Process notes from 72 group sessions were broken down. The Tedium Index assessed quantitative measures.	Limitations of this study include the trainees not representing the primary care internal medicine trainees at large, rather the specific cohort within this support group. There is additionally a lack of definitive answers using qualitative study and is open for interpretation.	Most common themes and emotions found in support groups included understanding resident roles and responsibilities, developing an identify as a resident and doctor, building professional confidence, cognitive and behavioral responses to stress, and concerns about flaws in local and national health care training and delivery systems. Emotions found were anxiety and guilt.
Tendulkar et al. (2005)	The purpose of the study was to determine if conditioning by residents on call would decrease stress levels among surgical residents with increasing level of surgical training. The sample included 28 general surgery residents.	IRB approval was obtained. The study was performed at a university-based trauma center. Holter monitors were placed on surgical residents to evaluate changes in heart rate. Residents were categorized based on years of training. Control data was obtained when the resident had no clinical responsibility. Mean HR,	Baseline information was collected, but personal health and lifestyle choices could impact the variables being recorded. Limitations included the resident's physical condition or medications, beverage including caffeine, anxiety levels,	When heart rate is used as an indicator of physical and psychological stress, residents achieve stress levels of tachycardia on call. White blood cell (WBC) counts are also increased when on call. Tachycardia and WBC counts are inversely related to level of training. Senior residents cope better with stress

		Maximum HR, and number of 1-hour time periods where HR was more than 120bpm were recorded. Conditioning was defined as a graded decreased in response to a stimulus while on call.	or underlying pathology that can change the variables monitored in this study.	on call than junior residents and interns.
Timmins, Corroon, Byrne, & Mooney (2011)	The purpose of this study was to identify student stressors associated with their nursing programs and its impact on lifestyle behaviors. 348 students from two universities were given a 146-item questionnaire based on the College Lifestyle and Attitudinal National Survey (CLAN).	A 146-item questionnaire was provided using the CLAN survey model. Ethical approval was gained from both local University Ethics Committees, and permission to conduct the surveys was obtained from the applicable Heads of School.	Limitations include the use of a two-site cohort. The findings are not representative, rather contextual. It is a self-report questionnaire, so there is a risk the respondent will respond for what is desired, rather than reality.	Results of this study indicate program related stressors such as examinations, clinical experiences, and assignments. The demands of the student academically, professionally, and personally increase stress levels of current nursing students.
Waugaman & Aron (2003)	The purpose of this cross-sectional study was to identify patterns of socialization among NATs during the professional socialization process where students may be at risk for attrition. Questionnaires were evaluated to assess the	IRB approval was obtained. The Student Nurse Anesthetist Questionnaire was used to assess the dimensions of socialization including education, cognitive occupational orientations, and relatedness to the professional role. Not all respondents	A limitation of the study is the fact anesthesia programs are changing their degree. As the degree requirements change, clinical integration is changing, and a further study on the correlation between the	A significant drop was found in the 1-2 year group when compared with the at least 2 year group. There was a significant drop in enrollment at the 12-18 months period.

	statistical influence of length of enrollment dimensions of socialization. The sample size was 1,119/2,008 (55%).	completed each items.	stress of starting clinical and attrition rate.	
Wildgust (1986)	The purpose of this study was to identify stress and how to cope with stress while in CRNA school. A qualitative perspective study identified sources of stress in junior and senior students. 8 junior students and 10 senior students who were enrolled in a two-year anesthesia program were polled to identify areas of stress.	IRB approval was not obtained. There were no discussions on how anonymity would be maintained. 3 categories of stress were identified: academic, clinical, and social/personal. Results were polled on a one to seven scale; one is no stress and seven is extremely stressful.	Validity of the study is still present, but more current research is a limitation as anesthesia has evolved over the years.	Results show information overload was the highest stressor in junior and senior students. Test anxiety was highest among junior students, decreased over time. Senior students had stress with intense clinical work and increased responsibility. Successful adaptation-individual must have skills, regulate pace of change and the ability to meet the demands, balance life with school.

References

Anspaugh, D. J., Hamrick, M. H., & Rosato, F. D. (2011). *Wellness: Concepts and applications.* New York, New York: McGraw- Hill Inc.

Chipas, A., Cordrey, D., Floyd, D., Grubbs, L., Miller, S., & Tyre, B. (2012). Stress: perceptions, manifestations, and coping mechanisms of student registered nurse anesthetists. *Journal of the American Association of Nurse Anesthetists, 80*(4 Suppl), S49-55.

Chipas, A., & McKenna, D. (2011). Stress and burnout in nurse anesthesia. *Journal of the American Association of Nurse Anesthetists*, *79*(2), 122-128.

Conner, M. (2015). Self-efficacy, stress, and social support in retention of student registered nurse anesthetists. *Journal of the American Association of Nurse Anesthetists, 83*(2) 133-138.

Cook, C., Heath, F., and Thompson, R. L. (2000). A meta analysis of response rates in Web- or Internet-based surveys. *Educational and Psychological Measurement, 60*(6), 821-836.

Dosch, M. P., Jarvis, S., & Schlosser, K. (2008). Attrition in nurse anesthesia educational programs as reported by program directors: the class of 2005. *Journal of the American Association of Nurse Anesthetists, 76*(4), 277-81.

Elisha, S., & Rutledge, D. N. (2011). Clinical education experiences: Perceptions of student registered nurse anesthetists. *Journal of the American Association of Nurse Anesthetists*, *79*(4 Suppl), S35-42.

Haoka, T., Sasahara S., Tomotsune, Y., Yoshino, S., Maeno, T. & Matsuzaki, I. (2010). The effect of stress-related factors on mental health status among resident doctors in Japan. *Medical Education, 44*(8), 826-34. doi:10.111/j.1365.2923.2010.03725.x

Kendrick, P. (2000). Comparing the effects of stress and relationship style on student and

practicing nurse anesthetists. *Journal of the American Association of Nurse Anesthetists*, *68*(2), 115-122.

Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York, New York: Springer Publishing Co.

McKay, K. A., Buen, J. E., Bohan, K. J., & Maye, J. P. (2010). Determining the relationship of acute stress, anxiety, and salivary alpha-amylase level with performance of student nurse anesthetists during human-based anesthesia simulator training. *Journal of the American Association of Nurse Anesthetists, 78*(4), 301-309.

Passalacqua, S. A., & Segrin, C. (2012). The effect of resident physician stress, burnout, and empathy on patient-centered communication during the long-call shift. *Health Communications, 27*(5)*,* 449-456. doi:10.1080/10410236.2011.606527

Perez, E. C., & Carroll-Perez, I. (1999). A national study: Stress perception by nurse anesthesia students. *Journal of the American Association of Nurse Anesthetists, 67*(1), 79-86.

Phillips, J. K. (2010). Exploring student nurse anesthetist stressors and coping using grounded theory methodology. *Journal of the American Association of Nurse Anesthetists, 78*(6), 474-482.

Ratanawongsa, N., Wright, S. M., & Carrese, J. A. (2007). Well-being in residency: A time for temporary imbalance. *Medical Education, 41*(3), 237-80. doi:10.1111/j.1365.2929.2007.02687.x

Satterfield, J. M. & Becerra. C. (2010). Developmental challenges, stressors and coping strategies in medical residents: a qualitative analysis of support groups. *Medical Education, 44*(9), 908-16. doi:10.111/j.1365.2923.2010.03736.x

Tendulkar, A. P., Victorino, G. P., Chong, T. J., Bullard M. K., Liu, T. H, & Harken, A. H.

(2005). Quantification of surgical resident stress "on call." *American College of Surgeons, 201*(4), 560-4. doi:10.1016/j.jamcollsrg.2005.05.004

Timmins, F., Corroon, A. M., Byrne, G., & Mooney, B. (2011). The challenge of contemporary nurse education programmes. Perceived stressors of nursing students: mental health and related lifestyle issues. *Journal of Psychiatric and Mental Health Nursing, 18,* 758-766. doi:10.1111/j.1365-2850.2011.01780.x

Waugaman, W. R. & Aron, G. L. (2003). Vulnerable time periods for attrition during nurse anesthesia education. *Journal of the American Association of Nurse Anesthetists*, *71*(1), 11-14.

Wildgust, B. (1986). Stress in the anesthesia student. *Journal of the American Association of Nurse Anesthetists*, *54*(3), 272-278.