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Certified Registered Nurse Anesthetists (CRNAs) are a specialty nursing group providing anesthesia for millions of rural Americans and are essential to the health care system. Seeking this career is stressful, and there are potential negative consequences from stress on students' health. Increasing the knowledge base regarding social support, stress and coping during nurse anesthesia student education would be efficacious for several reasons: to reduce stress in students, enhance learning, promote student success, facilitate improvement in coping strategies to be carried into practice, and to minimize the economic and sociologic factors of attrition. The aims of this study were to examine the stress, social support, coping and the intent to persist in students using a correlational, cross-sectional, non-experimental design. An online Qualtrics survey was administered to associate/student members of the American Association of Nurse Anesthetists (AANA) consisting of a demographic tool, the four item Perceived Stress Scale (PSS-4) (Cohen, Kamarck, & Mermelstein, 1983), the Brief COPE (Carver, 1997), Personal Resource Questionnaire 2000 (PRQ2000) (Weinert, 2003), and three items on intent to persist (Khalkhali, Sharifi, & Nikyar, 2013). Data were analyzed with descriptive statistics for each variable, and MANCOVA to examine the relationship between the independent variables of stress, social support, type of program, type of degree awarded, and the dependent variables of coping and intent to persist. The results showed that as social support and stress were significantly related to coping and intent to persist, and program degree and program type were not related to coping and intent persist. Additional

multiple linear regression analysis found that an increase in stress was associated with a decrease intent of students to persist in their education. The results also showed that increase in social support was associated with an increase intent of students to persist in their education. Multiple linear regression results also showed that an increase in stress is associated with an increase in coping. These results have implications for education, practice, and future research within in the nurse anesthesia profession and within all of nursing.

SOCIAL SUPPORT, COPING, STRESS, AND INTENT TO PERSIST IN  
NURSE ANESTHESIA STUDENTS

by

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Approved by

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I dedicate this dissertation to my husband, Michael Conner. Everything that I have accomplished is 100% a reflection of your greatness, love, and support. I also dedicate this work to our girls, Eleanor and Elin.

APPROVAL PAGE

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## CHAPTER I

### INTRODUCTION

The practice of nurse anesthesia was established in the late 1800s as the first clinical nursing specialty. This specialty grew as surgeons had an increased need for anesthetists. According to the American Association of Nurse Anesthetists (AANA), more than 49,000 Certified Registered Nurse Anesthetists (CRNAs) provide cost-effective, high-quality patient care that is essential to America's healthcare system (AANA, 2015). As anesthesia specialists, CRNAs care for patients before, during, and after surgical or obstetrical procedures. The CRNA is with the patient for the entire procedure, vigilantly monitoring every important body function and tailoring the anesthetic to the individual's needs to ensure the patient's maximum safety. In more than two-thirds of all rural hospitals in the United States, CRNAs are the sole anesthesia providers and this affords some 70 million rural Americans access to anesthesia (AANA, 2012). CRNAs administer a significant amount of the anesthesia to inner city residents as well. CRNAs are certified, qualified, and permitted by state law or regulations to practice in every state in the United States.

As the Affordable Healthcare Act is enacted in an effort to make health care more affordable, the necessity for CRNAs to practice in the healthcare system will likely increase. In a cost analysis evaluating anesthesia providers, CRNAs acting independently yielded the lowest economic cost with the greatest potential for positive revenue (Hogan,

Seifert, Moore, & Simonson, 2010). The next most cost efficient model uses a supervisory model where one anesthesiologist supervises more than four CRNAs, but revenue potential is limited. In a medical direction model, one anesthesiologist directs one to four CRNAs. The medical direction models tend to yield revenue benefits similar to CRNAs acting independently, but this is only possible in facilities with high, stable demand for anesthesia providers. However in rural areas with low demand, CRNAs acting independently is the only scenario that could yield positive revenue. There have been no significant differences in anesthesia complications between CRNAs and anesthesiologists, or in anesthesia delivery models (Dulisse & Cromwell, 2010; Hogan et al., 2010).

CRNAs work under minimal supervision by anesthesiologists or other physicians, and this practice results in CRNAs making decisions that are vital and profoundly influence patient outcomes (Perez & Carroll-Perez, 1999). The work of a CRNA usually requires critical decisions, use of complex technological equipment, and extensive responsibilities. For anesthesia students, the didactic learning, skill development, and administration of anesthesia occur in a stressful environment (Chipas & McKenna, 2011). Student registered nurse anesthetists (SRNAs) are also inundated with lectures, skill challenges, and being abruptly transitioned from a clinical expert in a previous environment to a novice in a new stressful environment. Therefore, stress is inevitable in the student registered nurse anesthetist (SRNA) population.

The ability to adapt or cope with stress varies among individuals (Chipas & McKenna, 2011). Stress can be a positive motivator for students, but at higher levels can

result in negative consequences (McKay, Buen, Bohan, & Maye, 2010; Wildgust, 1986). High stress levels can result in negative effects on the health and well-being of students; and if stress is excessive above an individual's ability to adapt, then physical or emotional disease can result (Perez & Carroll-Perez, 1999). Side effects of acute stress include

anger, irritability, depression, muscular problems, tension headaches, back pain, jaw pain, stomach and bowel problems, high blood pressure, tachycardia, sweaty palms, heart palpitations, dizziness, migraine headaches, cold hands and feet, shortness of breath, and chest pain (Chipas & McKenna, 2011, p. 123).

Chronic stress can lead to obesity, hypertension, ulcers, depression, substance abuse, and decreased ability to concentrate and learn. These consequences of stress are well documented. In nurses, stress has been found to lead to internal tension, increased risk of illness, job turnover, alcohol consumption, smoking, insomnia, and suicide (Perez & Carroll-Perez, 1999). Negative consequences of stress reported in nurse anesthesia students by Chipas et al. (2012) include, but are not limited to, anxiety, agitation, nervousness, decreased concentration, headaches, nervousness, sleep disturbances, overuse of alcohol, eating disorders, and digestion disorders. Chipas et al. (2012) also reported that 47% of nurse anesthesia students reported depression and 21% reported suicidal ideations. These consequences of stress could ultimately result in failure of nurse anesthesia students to complete their education.

According to Chipas et al. (2012), anesthesia students used a variety of coping methods for stress including going out with family/friends, seeing things in positive light, seeking emotional support, obtaining comfort from religion/spiritual beliefs, and getting

help from healthcare professionals. Many students had sought professional help for stress and 17% of their sample of 1,374 students were taking prescription medications for stress. Many students reported negative coping mechanisms such as using alcohol or other drugs and criticizing self, while some had simply given up on coping.

In a qualitative study of SRNA stressors and coping mechanisms, coping mechanisms were broken down into 3 types: problem-focused coping, emotion-focused coping, and a combination coping approach (Phillips, 2010). Problem focused coping involved time management, seeking more information about clinical situations, planning ahead, and using preprinted clinical data care plans. Exercise, avoidance of problem related thoughts, going out, procrastinating, spirituality, and withdrawing were used as emotion-focused coping. Combination coping included support groups, relationships with fellow students, and attending program-sponsored functions.

An important coping mechanism is a support system (Wildgust, 1986). Social support may yield a wide range of functions including “nurturing, empathy, encouragement, information, material assistance, and expression of sharedness” (Wildgust, 1986, p. 277). Presence and use of social support can be protective for those experiencing adverse levels of stress (Mechanic, 1978). Students’ coping mechanisms included ventilating frustrations to fellow classmates, reliance on personal support systems, exercise, use of relaxation techniques to deal with stressful situations, communicating feelings and/or frustrations to faculty, and seeking guidance from a professional counselor (Perez & Carroll-Perez, 1999).

Many studies have demonstrated the presence of stress in SRNAs (Chipas et al., 2012, Perez & Carroll-Perez, 1999; Wildgust, 1986), and the stressful operating room environment in which they learn a stressful profession (Chipas & McKenna, 2011; Wright & Fallacaro, 2011). Many studies reported the benefits of and needs for social support in order to manage stress and to cope as SRNAs. Wildgust (1986) suggested that successful adaptation was associated with two important coping mechanisms: a sense of humor and social support. Eighty-nine percent of students utilize support systems for coping (Perez & Carroll-Perez, 1999). Kless (1989) noted that students reported a positive effect of group experiences on stress reduction. Perez and Carroll-Perez (1999) concluded that students depend on and trust other anesthesia students to help them cope by sharing their frustrations and concerns. In 2010, Phillips suggested that a method to increase student motivation was via a planned, professional guided group counseling session. Nurse anesthesia students asked for peer support, for health and stress management tips, to integrate wellness into their nurse anesthesia educational programs, and for access to gyms or exercise (those who exercised reported less stress than those who did not) (Chipas et al., 2012). Open door policies or policies and practices that promote open communication in an environment of trust and mutual respect between students and faculty, were not found to meet the needs of the students in one study. There is also a high demand for accessible stress management resources (Perez & Carroll-Perez, 1999). With the documentation of stress in SRNAs, the recognized benefits of social support, the utilization of social support systems by some SRNAs, and the need for social

support requested by other SRNAs, the use of social support by nurse anesthesia students should be examined.

Six to fifteen percent of health profession students experience academic difficulties (Maize et al., 2010). Academic difficulties, clinical reasons, and personal reasons have all been cited as reasons for attrition in health professions education, and this leads to a loss for students, institutions, professions, and the public. If a student does not complete the program, his or her position cannot be filled retroactively. There is a loss to the withdrawing student in terms of non-refundable school related investments and tuition costs. This is a loss to another student who may have been capable of successful program completion (Mathis, 1993). Nurse anesthesia program loss involves decreased tuition dollars when there is student attrition. State supported schools utilizing public dollars make a significant financial investment per student for professional training. Attrition leads to a loss for society in terms of money collected via taxes for support of the program, and loss of a provider to meet the public health care needs. Generally nurse anesthesia students are required to end their employment arrangements for full-time study, and the critical care nursing unit loses a trained specialty nurse, with a reported turnover cost of \$64,000 per nurse (Strachota, Normandin, O'Brien, Clary, & Krukow, 2003). Attrition is a waste of time, money, and effort for all parties (Dosch, Jarvis, & Schlosser, 2008).

Attrition rates in nurse anesthesia education programs (NAEPs) are of interest to educators and to the profession as an important educational process outcome (Dosch, Jarvis, Schlosser, 2008). Attrition rates were reported in 1993 with an annual average



attrition rate of 8.2% between 1986 and 1990 (Mathis, 1993). A 2005 study reported the average cohort attrition rate of 9%, and concluded that this was comparable to that previously reported (Dosch et al., 2008). However, it was found that “attrition rates were higher in programs of longer duration” (Dosch et al., 2008, p. 277). Nurse anesthesia programs are transitioning to doctoral education with all graduates receiving doctoral degrees for entry into practice in 2025. With programs increasing in length with this degree change, some programs may have a year when they do not graduate a class. For the stability of the nurse anesthesia profession and workforce, student attrition must be minimized during this educational transition with increasing program length leading to potentially higher attrition rates.

There are conflicting reports as to the main reason for attrition in nurse anesthesia programs. Three different studies reported three different reasons including personal reasons, academic and clinical reasons, and improper socialization (Mathis, 1993; Ouellette, Courts, & Lincoln, 1999; Waugaman & Aron, 2003). Most students who did not complete the program left during the first year, but approximately 25% left after the first year (Mathis, 1993). Mathis further attributed dropping out to the stress of balancing the multiple roles of family, school, and work. In the latest study, attrition occurred most commonly via resignation with the reported reasons for student resignation listed as personal or health factors, poor academic performance, unawareness of time commitment, unawareness of job role and responsibilities of CRNAs, poor clinical performance, or impairment (Dosch et al., 2008). Another reason for attrition is academic or clinical dismissal. Academic dismissal was most often attributed to poor academic

preparation due to poor study habits, time management, poor undergraduate preparation, personal or health reasons, poor clinical performance, and lack of motivation. Clinical dismissals were related to poor clinical performance, lack of interest in the profession, and lack of motivation.

There are a few studies available on stress, social support, coping, and the intent to persist in nurse anesthesia students, but nothing could be located that looks at all of these variables together in the nurse anesthesia student population. A study of these constructs and how they relate could produce beneficial implications for anesthesia programs to support students and improve academic success as programs transition to doctoral education. Transition Theory (Meleis, 2010) can be used to investigate some of the transition facilitators and inhibitors of Registered Nurses (RN) in their journey from intensive care units to student nurse anesthetists to CRNAs by studying personal, community and societal factors that impact this transition and how they impact the students' intent to persist.

The goal of nurse anesthesia educational programs is to produce a safe anesthesia provider who is equipped with the personal tools, abilities, motivation to manage the stress and other job related issues, and practice in his/her chosen profession providing high quality cost efficient care. As nurse anesthesia programs transition to doctoral degrees in the coming years, students will need to cope and manage stress for a longer period of time. Nurse anesthesia school will continue to be stressful due to the nature of the associated responsibilities and the large amount of information necessary to adequately manage a patient's anesthetics. Social support has been shown to be helpful

for those facing adverse amounts of stress (Mechanic, 1978). There have been several studies that have suggested needs for more social support and stress management help for SRNAs (Chipas et al., 2012; Kless, 1989; Perez & Carroll-Perez, 1999; Phillips, 2010; Wildgust, 1986). This study provides for a better understanding of the relationship of social support and the intent to persist in students, who are coping with high levels of stress in nurse anesthesia school. If there is greater understanding in the relationships among these issues, nurse anesthesia programs could develop interventions to support students from the beginning of the program, and/or intervene earlier to support the student improving academic success. With a better understanding of these relationships, the development of interventions to prepare the student's support system as well could be developed.

### **Hypothesis**

This research tested the following alternative hypothesis: the independent variables of stress, social support, type of program, type of degree awarded predict the dependent variables of coping and intent to persist. The alternative hypothesis was tested against the following null hypothesis: stress, social support, type of program, type of degree awarded do not predict the dependent variables of coping and intent to persist.

## CHAPTER II

### REVIEW OF THE LITERATURE

Graduate level nurse anesthesia education is difficult and stressful. For students, they face many changes in this period. They are suddenly converted from an expert in the intensive care unit to a novice in a new environment, the operating room (Chipas & McKenna, 2011). The operating room is a stressful learning environment where the students are learning to manage complex anesthetics and intraoperative emergencies. The complexity of anesthesia necessitates that the students learn a vast amount of in-depth information, and thus students are inundated with material, lectures, and clinical information in a short amount of time. The students give up full time employment for full time studies, and this impacts their finances and requires them to learn to balance the personal and school responsibilities (Wildgust, 1986). Some students have to relocate to pursue their education (Perez & Carroll-Perez, 1999). All of these changes associated with beginning a nurse anesthesia educational program can impact the student's current social support system (Conner, 2015). The student may also need additional social support to help them cope during this stressful transition. All of these challenges have been discussed in the nurse anesthesia literature, and these challenges can impact the student's ability to complete their program of study if not successfully navigated. As previously discussed in chapter one, retention/attrition of nurse anesthesia students leads to a loss for all parties involved (Dosch, Jarvis, & Schlosser, 2008; Hagedorn, 2006;

Mathis, 1993): the student, the program, the nursing profession, and the nurse anesthesia profession. The most recently reported attrition rates in nurse anesthesia schools are nine percent (Dosch et al., 2008). Factors that might impact attrition of student registered nurse anesthetists (SRNAs) include social support, coping, and stress (Chipas et al., 2010; McKay et al., 2010; Perez & Carroll-Perez, 1999; Phillips, 2010; 2010, Wildgust, 1986). This chapter will describe the theoretical framework used to guide this study, and then review what is known about social support, stress, coping, and attrition.

### **Theory Used to Guide the Study**

**Origins.** Transition Theory was developed by Meleis (2010). After completing her doctoral studies, she was working with support groups and began looking for the common features of the support groups that were helping individuals with events like becoming a parent, losing a loved one, or receiving a bad diagnosis. She began first looking for common features of these groups, and moved to concluding that unhealthy transitions lead to role insufficiency. She then began looking for characteristics of healthy transitions. She concluded they were characterized by mastery of behaviors, cues, and symbols associated with new roles and identities. Initially, she did not address the nature of transitions or the nature of response to transitions. With a colleague in 1985, she began developing the concept of transition, which progressed to identifying the four major categories for transition (Meleis, 2010). An extensive review of the nursing literature for the use of transition as a concept in nursing further developed her theory (Im, n.d.). She subsequently came to see transition as a process. Her life's work had deductively brought about Transition Theory, a middle range nursing theory (Meleis, 2010).

**Meaning.** The major concepts noted and graphically depicted in this theoretical model include: nature of transition, transition conditions, patterns of response, and nursing therapeutics (Meleis, Sawyer, Im, Messias, & Schumacher, 2000). The nature of transition is based on the following attributes of type, pattern, and properties.

Transition is defined “as a passage or movement from one state, condition, or place to another” (Schumacher & Meleis, 1994, p.119). Transition theory (Meleis, 2010) addresses the many aspects of a transition including: the types, patterns, and properties that depict the nature of a transition, the facilitators and inhibitors of transition, as well as the response patterns and outcomes resulting from a transition.

This theory breaks down the nature of transition into types of transitions, patterns of transitions, and properties of transitions. Types of transitions can be classified as either developmental, situational, health/illness, or organizational. There are numerous transition patterns, and these include single, multiple, sequential, simultaneous, related, and unrelated. The properties of transition include awareness of the transition, engagement, change and difference, transition time span, and critical points and events (Meleis, Sawyer, Im, Messias, & Schumacher, 2000).

The transition conditions are also further broken down into facilitators and inhibitors. There can be community and societal level facilitators and inhibitors. There are numerous personal level facilitators and inhibitors that can affect the transition. These personal factors include meanings, cultural beliefs and attitudes, socioeconomic status, and preparation for and knowledge about transition (Meleis et al., 2000).

Patterns of response to transition include process indicators and outcome indicators. Process indicators describing response to transition include feeling connected, interactions, locating and being situated, developing confidence, and coping. The outcome indicators of transition are mastery and fluid integrative identities (Meleis et al., 2000).

There are four types of transition for classification purposes. These include developmental (birth, adolescence, motherhood, menopause, aging, and death), situational (educational, professional roles, changes in function and scope of practice, widowhood, immigration, homelessness), health/illness (as relates to a disease or condition), and organizational (the environment in terms of social, political, or economical) (Im, n.d.). Meleis et al. (2000) noted the importance of considering the relationship of a transition to another transition as most individuals are experiencing at least two at a time, and offers the following descriptors of transition patterns: single, multiple, sequential, simultaneous, related, and unrelated.

Properties of transition are portrayed as having the following attributes: awareness, engagement, change and difference, transition time span, and critical points and events. Awareness is noted as perception, knowledge, and recognition. Level of awareness is related to congruence with expectations. Engagement relates to degree of involvement. Change notes that the result of the transition is a change in identities, role, relationships, abilities, and patterns of behavior. Difference involves confrontation of differences as in divergent expectations, feeling different, different perceptions, or different world view (Im, n.d.). Another property is transition time span, and is

characterized as moving over time beginning with a starting point (anticipation, preparation, or change), and ending with a new beginning and stability (Meleis et al., 2000). The final property of transition is its critical points and events. These critical points can be associated with increased awareness of change, difference, or more active engagement, or the critical points can be as concrete as a birth or death. A final critical point is a sense of stabilization in new routines, skills, and roles (Im, n.d.).

The next major concept is transition conditions. It is related to the nature of the condition, and consists of personal, community, and societal conditions. Transition conditions can either function as facilitators or inhibitors (Meleis et al., 2000). Personal conditions have to do with individual attributes of meaning, cultural beliefs and attitudes (example: cultural stigmatization), socioeconomic status, and preparation and knowledge (example: anticipatory preparation or lack of preparation) (Im, n.d.). Community and society have an effect on the transition conditions, but no elaboration of these factors was provided in the description of the theory.

Patterns of response include process and outcome indicators. Process indicators are defined as a sign that a person in transition is moving; moving in a healthy adaptive manner or with vulnerable feelings placing an individual at risk (Im, n.d.). It is further characterized by additional concepts of feeling connected, interactions, locating and being situated, and developing confidence. Feeling connected has been demonstrated with examples in the literature with immigrants (Messias, 1997). Interactions give the transition meaning and a means for the adaptation of behaviors during the process. Locating and being situated acknowledges the time, space, and relationships in relation to



the current transition, previous position, and destination. Developing confidence and coping comes from understanding of the process (Im, n.d.). Abstractly and theoretically defined, outcome indicators include mastery of skills/behaviors to manage new situations, and a malleable identity leads to reformulation of new identity.

The last major concept is nursing therapeutics, which was conceptualized with the following concepts: assessment, preparation, and supplementation. These are provided without description of the exact relationship of this concept or to other concepts. This needs further development.

This theory makes several assumptions about transitions (Im, n.d.; Meleis et al., 2000). These assumptions demonstrate the complexity, subjectivity, and expansiveness of transitions. Assumptions about the phenomenon of transition include: “Transitions are complex, ... multidimensional, [and] ... characterized by flow and movement over time, [and] cause change in identities, roles, relationships, abilities, and patterns of behavior” (Im, n.d., p. 423). Transitions are a process and change fundamental life patterns, which are manifested in all individuals. These are the basis of how transitions in individuals, environments, and interactions are shaped by the nature, conditions, and response of their transition experiences. Vulnerability is related to transition conditions that expose individuals to negative outcomes. A healthy transition is evident with both process and outcome indicators. The pattern of transitions can be complex as a person can experience a single transition, multiple transitions, transitions that overlap, and related transitions. Meleis also suggest that one’s level of awareness influences the level of engagement, in that engagement requires some awareness (Im, n.d.).

For those who are undergoing transitions, nursing and nurses are in a position and have the ability to promote a healthy transition, and this depends on a therapeutic nurse-client relationship. This theory has been used numerous times in research in diverse settings and in people from different ethnic and cultural backgrounds (Im, n.d.). Some of the literature cited demonstrated transitions in individuals or groups, various settings, cultures, and types of transition including: becoming an African-American mother (Sawyer, 1999), menopausal transition in Korean immigrants (Im & Meleis, 1999), family caregiving (Schumacher, 1996), stroke survivors transitioning home (Rittman, Boylstein, Hinojosa, Hinojosa, & Haun, 2007), transition and socialization from health care assistant to student nurse (Brennan & McSherry, 2007), and memory loss (Robinson, Ekman, Meleis, Winblad, & Wahlund, 1997). These examples show specific applications of transition theory, but also demonstrate the wide boundaries for potential use.

**Logical Adequacy, Usefulness, Generalizability, Parsimony, and Testability.**

This theory was developed with the goal of identifying what is known about transitions, and is used as a framework for which to study transitions (Im, n.d.). This transition theory seems logically developed and logically useful in a wide variety of transitional experiences. This theory has been accepted by scientists and utilized in research studies about transition experiences related to nursing and health. It is applicable to practice as previously cited with examples. It has been used in education in several ways including explaining changed roles (Brennan & McSherry, 2007), as a curriculum framework, in a graduate course on transitions, and in the development of a center for transition and health at a university (Im, n.d.). Based on its wide spread utilization in all aspects of

nursing, transitions theory is highly generalizable across cultures, populations, types of transitions, and either individually or by groups. Transitions are complex processes, and this theory takes the complex nature of transition and parsimoniously addresses it. Transitional experiences revolve around the perspectives of the entity in transition (Schumacher & Meleis, 1994), and thus a qualitative approach may be beneficial. It is possible for the concepts that affect transition to be assessed and evaluated quantitatively.

Meleis's Transition Theory can also be easily applicable to the study of attrition/retention in nurse anesthesia students. Meleis's Transition Theory has been used to explore changes in practice roles (Brennan & McSherry, 2007) and nursing education (Klaich, 1990). Nurse anesthesia students engage in a developmental transition that is impacted by personal factors (preparation, knowledge, socioeconomic status as full time students), attitudes, community (nursing department and/or anesthesia program), and society (discipline, operating rooms/anesthesia departments). This transition process is marked by feeling connected, interactions, confidence development, coping, and transition outcomes of mastery (passing National Certifying Exam) and fluid integrative identity. This theory acknowledges that there are patterns of transition, so a developmental transition (graduate education) may lead to other possible transitions: organizational with a change in family leadership (Phillips, 2010); health/illness with development of depression, self-reported in 47% of anesthesia students (Chipas et al., 2012); and situational with relocation for school (Perez & Carroll-Perez, 1991).

The limitations in utilization of this theory for this study includes that the model specifies neither directional relationships between the concepts nor indications to the degrees of importance of their presence. Transitions are described

as periods of instability precipitated by developmental, situational, or health illness changes . . .that may produce profound alteration in the lives of individuals and their significant others and have important implications for well-being and health (Schumacher & Meleis, 1994).

These “periods of instability” leading to “profound alterations” for individual must cause the individual to experience some level of stress, but this is not mentioned in transition theory (Meleis, 2010).

Regardless of the theory used, it is important to understand a transition from the perspective those experiencing it (Schumacher & Meleis, 1994). For this study, I chose to use Transition Theory. It allows for understanding the whole SRNA perspective by considering patterns of transition (multiple, sequential, simultaneous, and related), and not just a singular developmental transition. This theory does not account for stress in transition, but with the literature reviewed showing that stress is prevalent in SRNAs and contributes to negative health outcomes, including stress as a variable could lead to a recommendation for recognizing stress as an inherent part of all transitions, and result in advancing Transition Theory.

Transition is a complex and dynamic process, and a portion of Transition Theory was utilized for this study. I sought information from research participants about several of their transition conditions including type of community (i.e. type of program), community and societal level facilitators and inhibitors (social support), and personal

factors. In considering where social support fits into transition theory, Schumacher and Meleis (1994) addressed the environment of the transition (community and society facilitators and inhibitors for transition condition). They cited many sources in support of social support as a community and society facilitator and/or inhibitor. Numerous studies showed the degree of support and aid from support outside the person may be beneficial during transition (Battles, 1988; Cheilens & Herrick, 1990; Ladden, 1990; Loveys, 1990; Meleis, 1987; Imle, 1990), that social support comes from family members, partners, friends, and therapeutic groups (Battles, 1988; Frank, 1991; Henderson, 1989; Hollander & Haber, 1992; Kenner & Lott, 1990; Majewski, 1987; Robinson & Pickney, 1992; Staples & Schwartz, 1990), and that the presence of a supportive preceptor, mentor, or role model is an important resource during professional transitions (Brautigam, Byrson, & Doster, 1989; Ceslowitz & Loreti, 1991; Dunn, 1992; Hindman, 1986; Shea, Adamczak, & Flanagan, 1987; Grady, 1992; Rice, 1988, Wuest, 1990). In the only study located in the literature utilizing transition theory to study nursing students, Giglotti (2004) used transition theory for her study on role stress in associate degree nursing students who were also mothers (n=132), and administered a perceived multiple role stress scale (PMRS) and the Norbeck Social Support Questionnaire (NSSQ). The PMRS is an eight-item scale that measures role stress from an individual's roles as a mother and a student. Personal factors that may affect the transition from Registered Nurse (RN) to SRNA to CRNA involve the individual's characteristics, preparation, knowledge, ways of coping, and length of time in anesthesia program.

Anesthesia school is a transition of great magnitude that affects the work life, social life, family life, personal philosophy, and nursing philosophy of each student who must give up their employment and begin full-time studies. These changes indicate that beginning anesthesia school may initiate multiple simultaneous transitions. This transition is impacted by personal, societal, and community influences. The transition can be facilitated or inhibited by knowledge, preparation, meanings, cultural beliefs, attitudes, and socioeconomic status (Meleis et al., 2000). These factors will affect how individuals will cope with the high levels of stress that will certainly develop during their education and may impact their academic success and intent to persist.

The outcome indicators for this transition and the dependent variables in this study were coping and intent to persist. The independent variables that were examined in this study are stress, social support, type of program, program degree awarded, class size, program length, and time in program.

### **Social Support**

The concept of social support is well represented in the literature. One definition used to describe social support is:

interpersonal transactions that include one or more of the following: the expression of positive affect of one person toward another; the affirmation or endorsement of another person's behaviors, perceptions, or expressed views, the giving of symbolic or material aid to another (Kahn, 1979, p.85).

This definition is comprehensive and recognizes the multidimensional nature of this concept, where the amount, type, and sources of social support are all important dimensions (Pagana, 1990). A psychosocial coping resource, social support has been

shown to positively affect personal resources such as self-esteem and self-efficacy and buffer the negative effects of stress (Hefner & Eisenberg, 2009; Thoitis, 1995). Social support can affect emotional health and well being (Kawachi & Berkman, 2001), and strong associations have been found between social support and mental health in a variety of populations (Berkman, Glass, Brissette, & Seeman, 2000; Caron, Latimer, & Tousignant, 2007; Coyne & Downey, 1991; House, Umberson, & Landis, 1988; Kawachi & Berkman, 2001; Leung, Chen, Lue, & Hsu, 2007; Seeman, 1996; Thoitis, 1995).

There is little basic understanding of how social ties (or one's satisfaction with them) actually function to protect mental health and promote psychological adjustment (Brown, Alpert, Lent, Hunt, & Brady, 1988). As a mediating variable often cited in the literature that describes the ability to survive unhealthy consequences of environmental stress, researchers have found that social support influences health in a variety of ways (Pagana, 1990). Some have found that social support influences health directly, others have shown that social support directly influences the level of stress, and others still suggest that social support acts as a buffer with the level of stress (Pagana, 1990). Failure to place the construct of social support into a consistent body of theory to suggest the mechanism of action and precursor processes limits the advancement of the science (Brown et al., 1988). Some of the theories used to study social support include: cognitive appraisal of stress (Coyne & Lazarus, 1980; Lazarus, Cohen, Folkman, Kanner, & Schaefer, 1980), transition theory (Meleis, 2010), person-environment fit theory (Brown, Brady, Lent, Wolfert, & Hall, 1987), and stress buffering theory (Barrera, 1986; Cohen & Willis; 1985; Cutrona & Russell, 1990; Thoits, 1986).

Utility of social support as a concept in research is complicated by a multitude of definitions, its many dimensions, and a variety of measurement tools that have been used to study it. Social support has been described in various ways depicting aspects like amount, type, quality, quantity, and source (Gigliotti, 2004). Social support has been discussed in terms of structural social support, functional social support, received social support, perceived social support, and also as specific types of social support. According to Caron et al. (2007), structural social support refers to the existence and quantity of relationships. Functional social support refers to the perceived quality of social relationships. Received support is related to the quantity of supportive behaviors that a person receives from members of their social support network, and perceived support is related to both the satisfaction with support and the availability of support by an individual from members of their social support network. (Melrose, Brown. & Wood, 2015). Social support has also been broken down by type of support including: emotional support, esteem support, tangible or instrumental support, informational support, and network support. Emotional support is the demonstration of a positive affect through empathy, caring or concern towards another individual (Melrose et al., 2015). A subtype of emotional support is esteem support (House, 1981), which is the affirmation of another individual's behaviors, perceptions, or expressed views (Cobb, 1976). Tangible or instrumental support relates to direct aid or assistance (Melrose et al., 2015). Informational support is support that provides guidance, advice, suggestions, or feedback (House, 1981). Network support provides a sense of belonging to a group of people (Cobb, 1976).



The measurement tools for social support vary in what aspect and/or dimensions they measure. For example, some only measure received support, while others measure perceived support and satisfaction with support. Social support literature suggests that there is a big distinction between received social support and perceived social support, and both have been found to lessen the impact of stress (Asberg, Vogel, & Browers, 2008; Cohen & Willis, 1985). Received social support makes an individual's stressors more visible and can negatively affect the individual's self-esteem or self-efficacy as the individual relies on support of others (Weiner & Hannum, 2012), and over (Reynolds & Perrin, 2004) and under supply (Jou & Fukada, 2002) of support can lead to negative health outcomes (Melrose et al., 2015). Perceived social support promotes a sense of security (Weiner & Hannum, 2012). It is regarded as preferable for study as it is more consistent and stable over time (Weiner & Hannum, 2012, and is not context dependent (Lepore, Evans, & Schneider, 1991).

There are several tools utilized in the literature to measure social support including: the Personal Resource Questionnaire (PRQ2000) (Weinert, 2003; Weinert & Brandt, 1987), Norbeck Social Support Questionnaire (NSSQ) (Hegge, Melcher & Williams, 1999; Pagana, 1990; Gigliotti, 2004), Inventory of Socially Supportive Behaviors (ISSB) (Melrose et al., 2015; Weiner & Hannum, 2012), Social Support Inventory (Brown et al., 1988), Multidimensional Scale of Perceived Social Support (Hefner & Eisenberg, 2009), Arizona Social Support Interview Schedule (ASSIS-S) and Social Support Appraisal Scale (Lepore et al., 1991). One study utilized a self-developed, social support questionnaire focused on a quantitative dimension of social support and

perceived satisfaction with the level of social support (Osseiran-Waines & Elmacian, 1994). These instruments have been used in a variety of populations including prospective teachers (Osseiran-Waines & Elmacian, 1994), college educated adults (Melrose et al., 2015) college students (Brown et al., 1988; Lepore et al., 1991; Dahlem, Zimet, & Walker, 1991; Kazarian & McCabe, 1991; Zimet et al., 1988), graduate and undergraduate students (Weiner & Hannum, 2012), and both associate (Gigliotti, 2004) and bachelors degree nursing students (Hegge et al, 1999; Pagna, 1990).

The Inventory of Socially Supportive Behaviors (ISSB) is one of the most widely used and well-validated measures of received support with alpha of 0.90. This scale does not measure the amount of support perceived nor does it explore the quality of the support received (Melrose et al., 2015). This 40-item scale is used to measure social support behaviors on a five-point Likert scale ranging from not at all (1) to about everyday (5). Weiner and Hannum (2012) modified the tool to 12 items and used a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7) in their study of undergraduate college students and the difference in the quantity of social support between geographically close and long-distance friendships. This modified version of the ISSB was used to examine support on a friend-by-friend basis and permitted the analysis of the difference in perceived (alpha = 0.93) and received (alpha = 0.98) social support.

The Social Support Inventory was developed by Brown et al. (1987), consisting of 39 interpersonal needs statements that respondents rated on two scales “How much of this type of help or support have you needed in the past month?” (Brown et al., 1988, p. 472) and “How much of this type of help or support have you received in the past

month.” (Brown et al., 1988, p. 472) in an attempt to develop a measure of perceived support and satisfaction with perceived support on a seven-point scale ranging from none (1) to very much (7) (Brown et al., 1988). This scale’s factor structure was tested in college students (n=340), and was found to have satisfactory discriminant and convergent validity, and the internal consistencies for the scales ranged from 0.79-0.91.

Various other tools have appeared in the literature. PRQ2000 has construct validity, divergent validity, good internal consistency ranging from 0.872-0.927, and measures perceived social support (Weinert, 2003; Weinert & Brandt, 1987). The Social Support Appraisal Scale, with adequate concurrent, convergent and divergent validity and good reliability with an alpha of 0.80-0.90, measures perceived social support. This tool uses a four-point scale, and responses range from strongly agree (1) to strongly disagree (4). It was modified and used in college students to assess overcrowding and social support (Lepore et al., 1991). The Multidimensional Scale of Perceived Social Support (MSPSS) is a tool to measure perceptions of social support quality and was used to study undergraduate and graduate students’ (n = 2,843) social support and mental health (Hefner & Eisenberg, 2009). The MSPSS consists of a 12-item scale comprised of three subscales (family support, friend support, and significant other support) with a seven-point response format ranging from very strongly disagree (1) to very strongly agree (7). The MSPSS tool has established reliability, validity, and factor structure across many populations including university students (Dahlem, Zimet, & Walker, 1991; Kazarian & McCabe, 1991; Zimet et al., 1988). The Arizona Social Support Interview Schedule (ASSIS-S) is a six-item measure of satisfaction with received support using a seven-point

Likert scale ranging from very dissatisfied (1) to very satisfied (7) (Melrose et al., 2015). The ASSIS-S has moderate test-retest reliability ( $r=0.69$ ).

The Norbeck Social Support Questionnaire (NSSQ) measures perceived social support, social support network size, types of social support (affirmation, affect, and aid), and network loss. Affirmation and affect together are a measure of emotional support, and aid is a measure of tangible support. This was developed using nursing and graduate students to establish test-retest reliability, response bias, concurrent validity, construct validity, predictive validity, sensitivity, stability, and factor structure (Norbeck, 1995; Norbeck, Lindsey, & Carrieri, 1981; Norbeck, Lindsey, & Carrieri, 1983). It has also been used in studies with nursing students. One study used the NSSQ with associate degree students ( $n=132$ ) to measure social support, and used another tool to measure role stress (Gigliotti, 2004). The NSSQ has been used in studies of hardiness and social support in nursing students (Hegge et al., 1999; Pagana, 1990). These studies reported an internal consistency range of 0.89-0.97 for the NSSQ.

Melrose et al. (2015) studied the relationship between received social support and perceived social support, and well being in adults ( $n=198$ ). This college educated convenience adult sample from 41 different states had a mean age of 32.5 years, was 76% white, and was 47.5% male. They hypothesized that a person's perception of support received is based not only on the number of times they receive support, but instead on the number of times they received it related to the number of times they need support. They further hypothesized that received and perceived support will be positively correlated until the point where an individual's support needs are met, and then a negative

correlation could occur in the presence of an oversupply. Researchers asked participants how many times in a typical month did they need support and did they receive support. Perceived support was measured using the MSPSS and ASSIS-S, and high scores on both of these measures indicated high levels of perceived support. They found that a measure of support when need is considered resulted in stronger correlations between received support and perceived support ( $r = 0.55$  for emotional support;  $r = 0.52$  for tangible support). This was compared to when received support was analyzed as just the number of supportive behaviors received ( $r = 0.26$  for emotional support;  $r = 0.23$  for tangible support). A limitation noted of this study only was that they only looked at two different types of support (emotional and tangible), and not at directive guidance (informational support) and positive social interactions.

Social support and mental health was researched by Hefner and Eisenberg (2009) in a random sample of college students ( $n = 1,378$ ). Structural support was measured by two questions from the Berkeley Graduate Student Mental Health Survey to assess the participant's frequency of contact with family and friends. Functional support was measured with the MSPSS, which measures perceptions of the quality of social support (Zimet, Dahlem, Zimet, & Farley, 1998). They found that a higher score for social support quality was independently associated with a lower likelihood of depression ( $p = 0.05$ ), anxiety ( $p = 0.04$ ), suicidal tendencies ( $p = 0.01$ ), and symptoms of eating disorders ( $p = 0.15$ ). They found that males ( $p = 0.08$ ) and those not living with a significant other ( $p = 0.05$ ) had lower quality support. Greater risk of social isolation existed for those of minority race or ethnicity, international status, and low

socioeconomic status. Social support was significantly negatively associated with measures of mental health. This relationship was strongest for depression, as evidenced by the incidence of depression in 31% of those with low quality support compared to 5% with high quality support. Perceived quality of support was most strongly and persistently associated with measures of mental health.

Lepore et al. (1991) researched the dynamic role of social support in the link between chronic stress and psychological distress in college students (n=173) using the SSA scale. They found that when perceived support is low, then short-term exposure to crowded living conditions might affect levels of psychological distress. They hypothesize that individuals in crowded living conditions assess the unsupportive interactions as less controllable and more threatening than interactions with supportive roommates. Lepore et al. (1991) further suggest that social support can function as a mediator of the effect of stress on well being.

In a study of the effects of how geographic distance affects the quantity of received and perceived social support provided by best friends, Hannum and Weiner (2012) used the ISSB to measure support in a sample of undergraduate students (n = 142). Significant differences were found between geographically close and long distance friends for received emotional support ( $t(142) = 3.41; p = 0.001$ ) and received informational support ( $t(142) = 8.99; p < 0.001$ ), and received instrumental support ( $t(142) = 8.85; p < 0.001$ ) with geographically close friends yielding more received social support than their long distance counterparts. There was no significant difference between the geographically close and long distance friends for perceived informational

support ( $t(142) = -0.62; p = 0.53$ ) and perceived instrumental support ( $t(142) = -1.05; p = 0.30$ ), but long distance friends gave more perceived emotional support ( $t(142) = -2.04; p = 0.04$ ).

Osseiran-Waines and Elmacian (1994) studied types of social support in relation to stress and academic achievement among prospective teachers in a non-Western sample of third and fourth year undergraduate university students ( $n = 81$ ). They measured anxiety with the Trait Anxiety Scale and Parsons' Teachers' Anxiety Scale. They measured social support with a questionnaire, which measured number of network persons, and degree of support available, and participants' perceived satisfaction with three types of support (cognitive, emotional, and instrumental). Academic achievement was measured by grade point average (GPA) from first semester averaged with second semester, and then that result averaged with second semester. Correlations between GPA and anxiety measures or social support were generally in the predicted direction, but failed to reach significance.

Gigliotti (2004) did a secondary data analysis to research the relationship between maternal-student role stress (the stress resulting from holding both a maternal role and a student role simultaneously) and total function support, individual types of support, and individual sources of support in married associate degree nursing students ( $n = 132$ ). Maternal-student role stress (MSRS) was measured with the perceived multiple role stress (PMRS) scale, and social support was measured with NSSQ. Older women (age  $>37$ ) reported more combined-type support (all types of support combined from specific sources) from their children ( $t = -4.23, p = 0.00$ ) and from clergy ( $t = -2.48, p = 0.2$ ).

Younger women reported more combined-type support from their mothers-in-law ( $t = 3.18, p = 0.00$ ). For younger women, neither affect, affirmation, nor aid was associated with less MSRS, but for older women affect ( $r = -0.33, p = 0.012$ ), affirmation ( $r = -0.26, p = 0.48$ ), and aid ( $r = -0.27, p = 0.042$ ) was associated with less MSRS. Thus, Gigliotti suggests social support should be studied in context, and to use this question to assess social support: “When you need time for school how much can this person help you?” (Gigliotti, 2004, p. 429).

The relationship of hardiness and social support to nursing students’ ( $n=261$ ) appraisal of stress in an initial clinical nursing situation was researched by Pagana (1990). Hardiness was measured with a 50-item hardiness tool with three scales (commitment, challenge, and control). Threat was measured with a clinical stress questionnaire that used a five-point Likert scale ranging from not at all (0) to a great deal (4) to assess the extent to which challenge and threat emotions were experienced in relation to the initial clinical experience. Social support was measured with the NSSQ. Social support was positively related to evaluation of challenge (measured on a four-point Likert scale ranging from not at all (0) to completely true (3)) only when using a work related measure of support ( $r = 0.11, p = 0.05$ ). Network size was significantly correlated with participation in religion ( $r = 0.25, P < 0.001$ ) (affect, affirmation, aid, work, and total functional support (TFS)). No relationship was found between TFS and challenge or threat, and this suggests that an initial clinical experience is so unique to nursing students that support from non-nursing sources cannot affect stress. She hypothesized that ample social support may not extend into the unique clinical experiences.



Hegge et al. (1999) researched hardiness, help-seeking behaviors, and social support as related to academic performance in baccalaureate nursing students (n=222). These variables were measured with questions on help-seeking behaviors, academic performance, factors affecting academic performance, and the NSSQ. The most commonly reported support person was a family member with spouse or partner most frequently mentioned, and respondents had relationships with their primary support person for more than three years. Twenty-two percent of respondents had lost a support person who provided them with a great deal of support. Researchers found no significant relationship between hardiness and social support, hardiness and help-seeking behavior, social support and help-seeking behavior, or social support and academic performance. Researchers did report respondents indicated that transportation ( $r = -0.1423$ ,  $p = 0.45$ ) distance from class ( $r = -0.1326$ ,  $p = 0.050$ ), finances ( $r = -0.1357$ ,  $p = 0.035$ ), and family obligations (children at home ( $r = 0.362$ ,  $p = 0.001$ ), spousal expectations ( $r = 0.224$ ,  $p = 0.036$ ), and family problems ( $r = 0.230$ ,  $p = 0.031$ )) impacted academic performance. The nursing students who were further along in their program (eighth semester) had significantly ( $p = 0.007$ ) higher social support scores than those earlier in their program (fifth semester). A limitation of this study was the narrow range for measuring academic performance led to little variability in responses, and may have impacted the ability to reach significance with statistical analysis.

Goplerud (1980) researched social interactions, support, and general satisfaction measures, stressful life events, and physical and emotional problem in graduate students (n = 22). All of the variables were measured with a questionnaire in which data were

collected over a ten-week period. Graduate students reported 3.89 stressful life events in the ten-week period. Fifty seven percent of all stressful life events were school related. Graduate students reported an average of 3.89 emotional and physical health problems during their first semester of graduate school with the most frequent problems including: periods of intense anxiety (81.8%), two or more periods of intense anxiety (63.9%), depression for three or more consecutive days (50%), and sleep problems not associated with studying (31.8%). The stressful life events of the graduate students were correlated with their total health and emotional problems ( $r = 0.52, p < 0.01$ ), and social support emerged as a moderating variable. The participants were divided into two groups, socially more active than the average student, and socially less active than the average student. The two groups did not differ significantly on the number of stressful events reported. The more socially active group members reported fewer emotional and physical health problems ( $t(20) = -2.06, p < 0.05$ ). The students who were supported (local residents, married, and with an above average number of total social contacts) compared to the unsupported students (from out-of-town, unmarried, and fewer total contacts) had fewer intense events ( $t(20) = -2.41, p < 0.025$ ), less stress ( $t(20) = -3.4, p < 0.005$ ); and fewer emotional and health problems ( $t(20) = -2.62, p < 0.01$ ). Faculty interactions had significantly positive effects on the students including: reports of intense events ( $r = -0.38, p < 0.05$ ), emotional and health problems ( $r = -0.38, p < 0.05$ ), general satisfaction with graduate experience ( $r = 0.48, p < 0.01$ ).

Kless (1989) researched the use of a student support group to reduce student stress in a nurse anesthesia program, but did not report sample size. Stress and the

function of the support group was documented by the student on evaluation sheets of the group experiences, and evaluated qualitatively. Students reported that the group experience helped reduce their personal stress. Some students felt that time required for the group meeting was an additional stressor. A limitation of this study was that the average student attended only three out of eight sessions.

Graduate school is the beginning of a period of major, unavoidable life changes, where graduate students in their first two years are placed in the life crisis category on the social readjustment rating scale (Goplerud, 1980, Perez & Carroll-Perez, 1990). Changes or the addition of new roles can produce role strain with entrance and exit from roles and role sets. As with college students when academic, social and psychological pressures are strong, and there are high expectations of success coupled with fear of failure, students experience stress (Osseiran-Waines & Elmacian, 1994). According to Osseiran-Waines and Elmacian (1994), social support is central to individual adjustment and

correlates negatively with psychological disorders..., positively with physical and mental health, protects people in crisis ..., and moderates effects of stressors on psychological well-being (p.5).

At high risk for physical and psychological problems, graduate students were the most frequent utilizers of psychiatric services after freshmen (Halleck, 1976).

Interventions to support graduate students as they enter, move through, and exit graduate programs could prevent the occurrence of psychological problems in this population, and the development of interventions and preventive strategies is necessary. Low social support has been linked to a wide range of mental health constructs including nonspecific

psychological distress, PTSD, eating disorders, low self-esteem, and clinical depression (Lakey & Cronin, 2008). Hefner and Eisenberg (2009) reported the prevalence of psychological disorders in college students: mood disorders in 11%, anxiety in 12% (Blanco et al., 2008), suicidal ideation in 6% (American College Health Association, 2008), past-year self-injury in 17% (Whitlock, Eckenrode, & Silverman, 2006), and eating disorders in 10% (Eisenberg, Nicklett, Roeder, & Kirz, 2011). Incidence of depression in SRNAs is 47% and suicidal ideation in SRNAs is 21% (Chipas et al., 2010) compared to the general college student population with an incidence of mood disorders of 11% and suicidal ideations of 6% (Hefner & Eisenberg, 2009). Examining social support in this population may bring to light why this particular group of graduate nurse anesthesia students has a quadrupled incidence of depression, and a tripled incidence of suicidal ideation, and/or possibly suggest a means to promote their psychological health and ultimately their educational success.

The studies reviewed measured social support in various populations (college students, graduate students, and nursing students), but none of the studies measured social support in the nurse anesthesia student population. Research shows that the SRNA population experiences high levels of stress, and high incidence of negative psychological problems such as depression and suicidal ideation (Chipas et al., 2010). A study on social support in this population could establish a basis for specific needs related to social support to mediate stress and psychological problems experienced in this population. Other social support study results cannot necessarily be applied to the SRNA population, because social support differs across groups and research and/or interventions are group

dependent (Hefner & Eisenberg, 2009). None of these studies measured social support in relationship to an intervention to increase, promote, or deliver social support to members of a sample. Those students who are more socially integrated have been found to have fewer emotional and health problems and fewer less intense stressful life events (Goplerud, 1980), yet again no literature was located on the implementation of interventions to increase peer or faculty social support for greater social integration of students. A study investigating the social support, stress, and coping in SRNAs might produce knowledge that could be used in the development interventions specific to this population.

SRNAs are members of a diverse group that varies in age, life experiences, marital status, sources of support, financial obligations, and family obligations. To begin to explore social support in this population, a qualitative study (Conner, 2014) was conducted using individual interviews to collect data and qualitative content analysis to analyze the data on social support in SRNAs ( $n = 6$ ). Participants were in various years in their program, all were married, some had children with ages ranging from 2 to 17 years of age, some relocated for school, some commute long distances, and some were local to the area. In this study, participants described social support in 256 incidences broken down as follows: 114 incidences of social support that was not specifically related to school, 83 incidences of social support specifically related to school, 41 incidences of empathy, and 21 incidences of venting. Other types of support or coping totaled 105 incidences, and were broken down as followed: 39 incidences of self-support, 26 incidence of coping via preparation, 22 incidence of isolation, and 18 incidences of other

ways of coping. This sample used social support to cope almost 2.5 times more than other means of coping. The use of social support needs to be explored in this population with a large randomly selected sample.

Many studies have shown the benefits of social support. The strongest case is for the perceived available support as the strongest predictor of well being in nurses when compared to all other types of coping (Payne, 2001). Given the strength of perceived social support particularly from previous research, the PRQ2000 seems to be the optimal tool as it is a measure of perceived social support, and allows for the measurement of a level of social support.

### **Stress and Coping**

When nurse anesthesia students begin their educational endeavor to become a Certified Registered Nurse Anesthetist, they engage in a major life transition. A transition of this magnitude affects their work life, social life, family life, personal philosophy, and nursing philosophy. This indicates that this may be an example of multiple simultaneous transitions initiated by beginning anesthesia school, and at some point these students will experience stress.

Stress is the “nonspecific response of the body to any demand made upon it” (Selye, 1974, p. 27). Stressors are defined as events that evoke stress in an individual. The ability to adapt or cope with stress varies among each individual (Chipas & McKenna, 2011). Sources of stress among the nursing student population include the academic stressors of testing, evaluation, fear of failure, and problems with workload (Pulido-Martos, Augusto-Landa, & Loepes-Zafra, 2011). The clinical stressors include

work, fear of making a mistake in clinical, negative responses to death or suffering, and relationships with other organizational members. The personal and social stressors can be economic problems and imbalance between housework/schoolwork (Pryjmachuck, & Richards, 2007b). High stress levels can result in negative effects on the health and well being of students; and if stress is excessive above an individual's ability to adapt, then physical or emotional disease can result (Perez & Carroll-Perez, 1999). Consequences of stress were well documented in chapter 1.

In reviewing the literature on stress, Lazarus and Folkman's (1984) Transactional model of stress is mentioned frequently. According to this model, there is a primary appraisal that occurs as the initial perception of a stressor. There is a judgment of the stressor to be positive (eustress), negative (distress), or benign (Gibbons, 2010). This primary appraisal is followed by a secondary appraisal where an individual draws on coping responses. There is individual variation between the perception of the primary appraisal and coping during the secondary appraisal, and this individual variation is affected by numerous moderators. Moderators can include self-efficacy, perceived control, support, and coping style. Lazarus and Folkman (1987) break coping into emotion-based coping and problem-based coping. There are theories that consider the different responses to stress, for example: fight or flight responses are a commonly known biological reaction to stress; psychosocial effects of stress can affect memory, attention (Cohen et al., 1973), and fatigue (Tanaka, Fukuda, Mizuno, Kuratsune, & Watanabe, 2009); can lead to emotions (Maslach, 1979) characterized by anxiety (Chipas et al. 2012), fears (Wildgust, 1986), and/or depression (O'Reilly, McNeill, Mavor, &

Anderson, 2014); and can affect social behavior (Sherif & Sherif, 1953) characterized by isolation (Reeve et al., 2013) or in taking out stress on others (Tully, 2004).

There are many studies that have researched aspects of stress including the level, sources, consequences, and how to cope with stress. Some of the common tools for studying stress are the Perceived Stress Scale (She et al. 1997), Student Nurse Stress Index (SNSI) (Jones & Johnson, 1999), and Stress in Nurse Education questionnaire (SINE) (Rhead, 1995). Stress is measured with the 14-item Perceived Stress Scale to assess the degree to which things in an individual's life were interpreted as stressful, unpredictable, uncontrollable, and/or overloaded. With this scale, high scores also indicate higher levels of stress, and the scale has a coefficient alpha reliability of 0.85. Academic load, clinical sources, interface, worries, and personal problems are studied with SNSI (Jones & Johnson, 1999). This 22-item tool has acceptable factor congruence, good internal reliabilities for factors ranging from 0.67 – 0.81, and concurrent and discriminant validity. Stress can also be measured with The Stress in Nurse Education Questionnaire. This 32-item tool was specifically designed for nursing education, and utilized a 4-point Likert scale (0 – not stressful to 3 – extremely stressful). It yields a total stress score with a possible range of 0-96, and subscale scores for both clinical and academic stress. The Cronbach's alpha was 0.885 for the overall scale in this study. There are also other stress tools as well. The 51-item Student-life Stress Inventory (SSI) (Gadzella, 1994) looks at types of stressors, reactions to stressors, and an overall stress rating (1-mild, 2-moderate, 3-severe). The Cronbach's alpha for the SSI was reported at 0.91 in one study, and a total instrument internal consistency was 0.92 (Goff, 2011). The



Index of Sources of Stress in Nursing with 29 items measures learning and teaching, clinical placement-related issues, and course organization, and this was coupled with items to measure support on a continuous scale for each item, with zero used for no source of stress and 5 as an extreme source. Reliability of this scale was not reported, and this scale has since been revised to a 53-item tool with a Cronbach's alpha of 0.93 (Gadzella, Baloglu, Masten, & Wang, 2012). Though there are several available tools that are all slightly different being used by researchers, there are still many researchers who develop their own tools. The numerous tools available, including many researcher developed tools make it difficult to compare results from one study to another, and possibly more difficult to grow the understanding of stress and stress theory.

A cognitive-phenomenological theory of stress-coping was developed and addressed the relationship between stress and coping by Lazarus and Folkman in the 1980s. Stress and coping were linked in this theory by cognitive appraisal (Hays, All, Mannahan, Cuaderes, & Wallace, 2006; Song & Nam, 2010). The theory held the view that stress was an unavoidable part of human nature, and that differences in adaptation were due to coping (Hays et al., 2006). The definition of coping encompasses both cognitive and behavioral efforts to manage specific internal and external demands that are assessed as demanding, or greater than the resources of an individual (Hays et al., 2006; Song & Nam, 2010; Terhorst & Mitchell, 2012). Coping is characterized as a process, which indicates it is dynamic and changes with shifts in person-environment relationships due to continuous appraisals and reappraisals (Folkman & Lazarus, 1988). Pearlin and Schooler (1978), describe three ways that coping behaviors are protective including: 1)

they eliminate or modify conditions causing the problem, 2) the meaning of the problem is perceptually controlled in a manner that defuses it, 3) they keep the emotional consequences of a problem manageable.

Coping is usually broken down into two types of coping: problem-focused coping and emotion-focused coping (Ashker, Penprase, & Salman, 2012). Problem-focused coping is focused on changing the person-environment relationship by changing one component of the relationship. Emotion-focused coping is focused on altering the way the person-environment relationship is addressed by addressing it through vigilance or avoidance or altering the meaning of what is happening to decrease stress, even though the relationship conditions themselves have not been altered (Terhorst & Mitchell, 2012).

The ego-psychology approach identifies many processes for handling person-environment relationships. In a hierarchical arrangement of these processes, coping is “the highest, most advanced, or mature ego process” (Folkman & Lazarus, 1988, p. 3). Problem-focused coping is mostly used in situations that are deemed amenable to change. Emotion-focused coping is mostly used in situations appraised as being out of the control of the participant (Folkman & Lazarus, 1988). Problem-focused coping has been associated with lower levels of negative health outcomes, so these behaviors are also called positive coping types. Emotion-focused coping has been linked to negative health outcomes, so these behaviors are referred to as negative coping types (Mark & Smith, 2012).

There are quite a few well-utilized coping instruments available. Learned resourcefulness, a specific type of coping, can be measured with 36-item Self-Control

Schedule (SCS) (Rosenbaum, 1980; Rosenbaum, 1990) with a six-point scale ranging from very characteristic of me (+3) to very uncharacteristic of me (-3). This scale was used by participants to indicate their uses of problem-solving strategies, the use of self-statements to control emotional responses, perceived self-efficacy, and the ability to delay gratification, with higher scores indicating greater levels of learned resourcefulness. Construct, convergent, and discriminant validity has been established, and this tool has a Cronbach's alpha of 0.77 (Goff, 2011). The 23-item Deakin Coping Scale (Moore, 2003) has four factors, each with adequate internal reliability ( $\alpha = 0.64$  to  $0.88$ ). The four factors include cognitive appraisal, challenge/commitment, avoidant, and use of social resources. This four-factor model also demonstrated good model fit. Participants responded to each item based on a five-point Likert scale ranging from never (1) to always (5). The 53-item COPE (Carver, Scheier, & Weintraub, 1989) is used to measure coping strategies. Respondents indicate responses (problem-focused coping or emotion-focused coping) to stress on a five-point Likert scale for 14 different categories of coping responses. The COPE reports a reliability of 0.81 (Hegge & Larson, 2008). The 28-item Brief COPE (Carver, 1997) utilizes a four-point scale to determine frequency of coping responses ranging from 'usually don't do this at all' (1) to 'do this a lot' (4). This instrument had fourteen scales, with Cronbach's alpha greater than 0.8 for each factor, and total scale reliability was reported as 0.82 (Kimemia, Asner-Self, & Daire, 2011). The subscales include: self-distraction, active coping, denial, substance abuse, use of emotional support, instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. The 44-item Ways of

Coping Questionnaire (Parkes, 1984) looks at coping with three factors: general coping, direct coping, and suppression coping. Respondents are asked to report the coping strategies used in difficult situations. Further psychometric properties or description of this tool were unable to be located. The Coping Inventory for Stressful Situations (CISS) (Endler & Parker, 1990) has 48-items covering task-oriented coping, emotion-oriented coping, and avoidance-oriented coping, and responses were on a five-point Likert scale ranging from not at all (1) to very much (5). The higher the coping score with ranges from 16-80, then the higher the coping activity. Internal reliabilities have been reported with a range from 0.88-0.92 (Brands, Köhler, Stapert, Wade, & van Heugten, 2014). The American Psychological Association (APA) of Graduate Students (APAGS) and the APA Advisory Committee on Colleague Assistance (ACCA) developed a survey, the APAGS-ACCA, to assess stress, coping, and barriers to wellness. Good internal reliabilities are reported for stress (0.85), coping (0.87), and barriers to wellness (0.86). Stress was measured with 22 items covering major and minor life events with responses on a five-point Likert scale ranging from none (0) to severely (4). Coping was measured with 20 items covering a wide range of activities used to overcome challenges on a six-point Likert scale with responses ranging from never (0) to completely (5). Twelve items were used to assess the barriers to wellness, and the degree to which the items were barriers to wellness on a five-point scale ranging from not at all (1) to completely (5).

Goff (2011) researched the mediating effect of learned resourcefulness on the relationships of stressors (both personal and academic) to academic performance in baccalaureate nursing students ( $n = 53$ ). Stressors were measured with the 51-item

Student-life Stress Inventory (SSI). Learned resourcefulness was measured with 36-item Self-Control Schedule (SCS). Researchers found high levels of both personal and academic stressors, and some of the most reported stressors included: deadlines, overload of things to do, competition on grades or work, test taking anxiety, worry about everything/everybody, procrastination, perfectionism, delays, and daily hassles. Many reactions to stressors were reported, and the most common were fear, anxiety, and worry, followed by thoughts and analysis of how stressful situations were, and if coping strategies used were effective. The behavioral responses to stress were also reported as crying, irritability, exhaustion, and sweating. The high levels of academic and personal stressors were not significant predictors of academic performance ( $r(52) = 0.008$ ,  $p = 0.955$ ). Age correlated more than stressors with academic performance ( $F(2, 46) = 4.83$ ,  $p = 0.012$ ), and even greater correlations were found when learned resourcefulness was added to the model ( $r = 0.374$ ,  $p = 0.042$ ), accounting for 18% of the predicted variation. This study demonstrates the high levels of stressors nursing students experience, and the correlation of age with academic performance. The small, convenience sample size from one institution and one level in the nursing program, limited variability in the dependent variable, self-reported GPA, and the SCS tool which was developed in Israel, a different culture than the sample, were limitation of this study.

Reeve et al. (2013) studied perceived stress and social support in undergraduate nursing (both traditional and Registered Nurse (RN) to Bachelor's of Science in Nursing (BSN) Degree) students ( $n = 107$ ). They used the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), Deakin Coping Scale (Moore, 2003), Social Support

Questionnaire (Sarason et al. 1987), the Student-life Stress Inventory (Gadzella, 1994), and three open ended questions. The participants reported their feelings associated with stressful situations including 95.7% who had anxiety, 87.8% who worried, and 42.1% who experienced depression with stress. Respondents reported many coping strategies including: working out, talking and hanging out with family and friends (the most used), ignoring the stress, feeling sad, crying, and separating self from others. A large number of the respondents (43.5%) relied on fellow nursing students as a way to cope. The respondents reported using members of their social support network to help them cope with stress, and reported feeling better after a stressful event after engaging in a period of reflection.

Gibbons (2010) studied stress, coping, and burn out in nursing students (n = 171) in their final year. This study utilized Lazarus and Folkman's (1984) Transactional model of stress. The instrument used to measure the stress and social support was the Index of Sources of Stress in Nursing with 29-items, and it was coupled with items to measure support on a continuous scale for each item with zero used for no source of stress and 5 as an extreme source. Researchers also used the Generalized Self-Efficacy scale (Schwarzer, 1992), Maslach Burn-Out Inventory (Maslach & Jackson, 1986), the Marlowe-Crowne Social Desirability scale (Crowne & Marlowe, 1960), and the Brief CPOE (Carver, 1997). The ten-item Generalized Self-Efficacy scale measured self-efficacy with participant responses on a four point scale ranging from not at all to exactly true. The 22-item Maslach Burn-out Inventory measures the components of burnout including emotional exhaustion, depersonalization, and personal achievement. This scale

ranged from 0 (never) to 6 (everyday). The Marlowe-Crowne Social Desirability scale was used to determine a social desirability bias. The 28-item Brief COPE utilizes a four-point scale to determine frequency of coping responses ranging from 'usually don't do this at all' to 'do this a lot.' This instrument had four scales, and Cronbach's alpha was greater than 0.8 for each factor. Researchers found that with an increase in avoidance coping that there was an increase in emotional exhaustion, and all the other relationships with avoidance coping were negative. As student age increased, so did the respondents' report of emotional exhaustion. Researchers also found that increased self-efficacy led to higher personal achievement.

Wolf, Stidham, and Ross (2015) researched the predictors of stress and compared the coping strategies between Baccalaureate nursing (BSN) students and accelerated (ABS) nursing students in a mixed methods study with a sample of 210. The tools used included a demographic tool, screening for depression, the Perceived Stress Questionnaire, Rosenberg Self-Esteem Scale, Multidimensional Scale of Perceived Social Support, as well as open-ended questions. Researchers found that the predictors of stress for both types of nursing students included a history of depression, year in the program, emotional support, and self-esteem. The similar common stressors were reported in this sample as well, including: fear of failure/clinical incompetence, problematic relationships, and time management issues. The significant predictors of stress included positive correlations of history of depression and year in the program ( $p = 0.013$ , and  $p = 0.0014$ , respectively), and self-esteem was negatively correlated with stress ( $p = 0.0001$ ).

Qualitative results show that positive thinking was used a coping strategy, as well as seeking out social support from family and friends.

Hegge and Larson (2008) researched stressors and coping strategies in students ( $n = 137$ ) enrolled in ABSN programs with the 53-item COPE ( $\alpha=0.81$ ). The majority of ABSN students rated their stress as either extreme (17.5%) or extensive (43.8%). Stresses from the ABSN program far exceeded the previous stress experiences of students in 23.4% of the sample. The most helpful coping strategies in order of helpfulness were: seeking social support, turning to religion, positive reinterpretation and growth, planning, acceptance, and seeking social support for instrumental reasons. The least helpful were denial and behavioral disengagement. Researchers reported the major stressor for ABSN students in this sample was the vast amounts of material to be mastered in a short time and managing personal and family life while in school.

Tully (2004) researched stress, sources of stress and the ways of coping in psychiatric diploma nursing students ( $n = 35$ ). The General Health Questionnaire (GHQ), the Student Nurse Stress Index (SNSI) (Jones & Johnson, 1997), and the Ways of Coping Questionnaire (Parkes, 1984) were the tools used in this study. The 30-item GHQ was used to look at the student's level of distress, as well as what that stress does to the individual. The 44-item Ways of Coping Questionnaire (Parkes, 1984) looks at coping with three factors: general coping, direct coping, and suppression coping. Academic load, clinical sources, interface, worries, and personal problems were studied with SNSI (Jones & Johnson, 1999). The conventional cut-off score for distress is five, and all the respondents in this sample exceeded this level (first year student mean = 20.7000 and



second year student mean = 27.0667). The GHQ scores were inversely related to the Direct Coping Scale ( $r = 0.529$ ,  $p < 0.01$ ), so as GHQ scores increased, direct coping decreased. The coping methods seen in students with high distress included: wishing things were different, eating, drinking, smoking, taking medications, taking it out on others, and/or trying to forget about it. Those students with lower levels of distress reported different and more problem-focused coping strategies including: talking to others, changing things to improve the situation, and trying to take one step at a time. There was not a statistically significant difference in first and second year students, but there was a statistically significant difference between females and males on the SNSI ( $t = -2.11$ ,  $p < 0.05$ ), and the mean GHQ and the mean SNSI ( $r = 0.501$ ,  $p < 0.01$ ). Females scored significantly higher on the academic subscale of the SNSI ( $t = -4.067$ ,  $p < 0.01$ ), second year students scored higher on the personal subscale of the SNSI ( $t = 5.782$ ,  $p < 0.05$ ), and high personal and clinical subscales correlated with high GHQ scores. Also correlated with GHQ scores were the items of peer competition, personal health problems, relations with other professionals, staff relations in the clinical area, too much responsibility, client attitudes towards me, client attitudes toward my profession, and atmosphere created by teaching staff. These nine correlations between sources of stress indicate that these factors caused students in this study a significant amount of distress. Study results showed all the students were very stressed, possessed limited coping skills, and together these may place the student's well being at risk.

In a longitudinal study of stress and self-esteem in nurses at five different points in time ranging from eight months in their program to the end of their third year, sample

size ranged from 77-112 between the five measurement times (Edwards, Burnard, Bennett, & Hebden, 2010). Stress was measured with The Stress in Nurse Education Questionnaire. This 32-item tool was specifically designed for nursing education, and utilized a 4-point Likert scale (0 – not stressful to 3 – extremely stressful). It yielded a total stress score with a possible range of 0-96, and subscale scores for both clinical and academic stress. The Cronbach's alpha was 0.885 for the overall scale in this study. Self-esteem was measured with the 40-item Culture Free Self-esteem Inventory, and addressed four subscales including general self-esteem, social self-esteem, personal self-esteem, and lie subtest, which indicates defensiveness. Increased stress correlated with decreased self-esteem at three time points ( $p < 0.05$ ), and overall stress changed over time to decrease significantly between the first time and the fourth time ( $T4 > T1$  CI-11.64 to -0.49). Items that came up as stressors across all the time points included: exams, pressure to meet deadlines, having to study after a day's work, fear of making a mistake with a patient, and watching a patient suffer.

O'Reilly et al. (2014) investigated the role of academic stressors compared to personal stressors in the level of depressive symptoms in graduate medical students ( $n = 67$ ). The incidence of depression in the medical student population is 24%. Depression was measured using the 20-item Centre of Epidemiological Studies Depression Scale (CES-D Scale) for characteristic symptoms of depression by asking about the frequency that participants experience each depressive symptom in the previous week. This tool has been used in several studies, and is a validated scale with internal consistency with  $\alpha \geq 0.85$ , test-retest reliability, concurrent validity, and construct validity. The number and

impact of recent life events experienced by participants was measured with a modified version of the Psychiatric Epidemiology Research Interview (PERI) Life Events Scale. The number of personal stressors was correlated with the number of academic stressors ( $r(67) = 0.387, p = 0.001$ ), and the number of both personal and academic stressors was positively correlated with scores on the depression scale ( $r(67) = 0.321, p = 0.008$ ). The perceived impact of a participant's reported academic ( $r(67) = 0.489, p < 0.001$ ) and personal stressors ( $r(67) = 0.412, p = 0.001$ ) on the depression scale suggest that these variables are related. High impact academic stressors in this sample included beginning a new course of study (highest impact of 2.86) in 10% of the sample, preparation for an examination (impact of 2.35) in 76% of the sample, preparation for a major assignment (impact of 1.88) in 77% of the sample, and feeling fatigued due to study commitments (impact of 2.31) in 88% of the sample. The academic stressors experienced by medical students does make a contribution to the resulting depressive symptoms beyond that accounted for by personal stressors.

Tanaka et al. (2009) did a study to see if stress and coping was related to fatigue in Japanese medical students ( $n = 73$ ). Participants completed several questionnaires including one on fatigue (Chalder Fatigue Scale), stress, stress coping (Coping Inventory for Stressful Situations), overwork, and nocturnal sleeping hours. The 11-item Chalder Fatigue Scale has possible score ranges from 0-11, and higher scores are associated with higher degree of fatigue. The Coping Inventory for Stressful Situations (CISS) has 48-items covering task-oriented coping, emotion-oriented coping, and avoidance-oriented coping, and responses were on a five-point Likert scale ranging from not at all (1) to very

much (5). The higher the coping score with ranges from 16-80, then the higher the coping activity. Researchers found that stress and avoidance-oriented coping styles were positively associated with severe fatigue in medical students, and remained influential even after the adjustment for age, gender, task-oriented coping, and emotion-oriented coping. Interestingly, researchers did not find a correlation between severe fatigue and nocturnal sleeping hours. Fatigue is a common complaint in the medical student population, and is associated with poor academic performance and absenteeism.

El-Ghoroury, Galper, Sawaqdeh, and Bufka (2012) studied stress, coping, and barriers to wellness among psychology graduate students (n = 267-271) using the APAGS-ACCA. The top three stressors reported, all with a mean severity rating of 1.9 determined from a scale of none (0) to severe (4), were academic responsibilities or pressure (68.1% of sample), finances or debt (63.9% of sample), and anxiety (60.7% of the sample). With a severity rating of 1.8, poor work/school-life balance was reported by 58.7% of respondents. Lack of social support was reported by 36.3% of the sample. Coping strategies reported by at least half the sample to be moderately effective included: friends' support (72.4% of the sample), family support (64.8% of the sample), talking to a classmate (63.8% of the sample), regular exercise (54.3% of the sample), and hobbies (52.0% of the sample). The two most reported barriers to using wellness strategies were lack of time (70.6% of the sample) and financial cost/constraints (46.5% of the sample).

Judkins, Arris, and Keener (2005) measured stress and hardiness in eight graduate nursing administration students using a 30-item version of the Hardiness Scale (Bartone, Ursano, Wright, & Ingraham, 1989). Higher scores on the Hardiness Scale were

associated with higher levels of hardiness. Stress was measured with the 14-item Perceived Stress Scale to assess the degree to which things in an individual's life were interpreted as stressful, unpredictable, uncontrollable, and/or overloaded. With this scale, high scores also indicate higher levels of stress, and the scale has a coefficient alpha reliability of 0.85. However, in this sample the alpha coefficient reliabilities were not sufficient per the authors' report, nor were they reported in the article. Therefore, the authors did no quantitative analysis. Stress scores were reported as moderately high, and increasing from the pre-evaluation at the beginning of their program to the post-evaluation measurement at six to twelve months after graduation.

Holder (1986) studied the effects of clinical education on nurse anesthesia students ( $n = 54$ ) and nurse midwifery students ( $n = 40$ ) by examining anxiety levels before and six weeks after clinical training. There was no difference in either group's original trait anxiety. The state anxiety and sensation seeking were higher in nurse anesthesia students, but state anxiety was elevated in both groups. According to Perez and Carroll-Perez (1999), high sensation seeking scores correlate with increased level of substance abuse in a sample 1,400 SRNAs. They also suggest that an increase in number of life changes correlates with a higher incidence of illness and injury. According to the Social Readjustment Rating Scale, all nurse anesthesia students are in a state of moderate life crisis due to changes in financial status, a new line of work, beginning school, and change in social activities. Other changes that could occur that could move them to major life crisis include changes in residence, marital conflict, changes in sleep or eating habits, and illness of friend or family member (Perez & Carroll-Perez, 1999).

Wildgust (1986) studied sources of stress in nurse anesthesia junior (n = 8) and senior (n = 10) students. Sources of stress were broken down into three categories: academic, clinical, and social/personal. Students were asked to rate stressors on a 1 (no stress) to 7 (extremely stressful) scale on a researcher-developed tool. Senior students reported seven sources of extreme stress including: information overload, national certification exam, heart room rotation, pediatric rotation, fear of patient death, and being prepared to graduate as a competent practitioner. Junior students report far more sources (14) of extreme stress than senior students, and these included: information overload, test anxiety (first term), fear of failure, disorganized lectures, instructor reading from notes, first induction/intubation, lack of confidence in one's self, lack of consistency among clinical instructors, role ambiguity (beginning of term), adapting to new environment, loss of income, meeting own goals and expectation, lack of time for family, and conflict of personal and program demands.

Stressors and coping were explored in SRNAs (n = 12) by Phillips (2010) using grounded theory. Three categories of coping emerged: problem-focused coping, emotion-focused, and combination coping approach. Examples of problem focused coping were defined as actions taken that were directed at the problem, and included: time management, seeking additional information, asking for additional material, planning ahead, and using preprinted clinical care plans. Examples of emotion-focused coping were methods used to neutralize unpleasant emotions related to a problem, and included: exercise, avoiding thinking about the problem, going out, procrastinating, relying on their spirituality, and withdrawing. Combination coping approaches included use of social

support, getting involved with other students, and attending program-sponsored functions. The personal stressors reported by participants in this study included: role strain, lack of personal time, relationships with children/family, body image, relationship with significant other, relationships with classmates, problems sleeping, and financial issues. Academic stressors included: expectations, class structure, ongoing personal conflict with peers, fear of reprimand, conflict with instructors, ineffective time management, clinical assignments, fatigue, workload, competence as a future provider, fear of clinical error, taking certification exam, and fear of dismissal.

Kendrick (2000) compared the effects of stress and relationship style in a convenience sample of student and practicing nurse anesthetists (n = 81, SRNAs = 67, CRNAs = 15). This research used numerous tools, and reported no psychometric properties of any of the instruments. These included: the Occupational Role Questionnaire (ORQ), the Personal Resources Questionnaire (PRQ), the Personal Strain Questionnaire (PSQ), and the Strength Deployment Inventory (SDI). Coping was assessed with the four scales of PRQ, and stress was assessed with the ORQ. He found that second year students had the greatest amount of stress, and first year students had next to the lowest level. First year students had yet to begin the clinical component, and Kendrick further suggests that clinical component is more stressful than the academic component. CRNAs had the lowest level of stress. Third year students have accumulated more debt than other students and may be more financially strained and limiting their self-care and recreational options for managing stress. Third year students also had less

social support, as this group had the highest percentage of divorced students and the lowest number of dependents.

In a previous study by Chipas et al. (2012), data were collected on stress from 1,374 nurse anesthesia students. The stress level on an average day reported by the students yielded a mean of 7.2 on a scale of 1 to 10. On this scale one was low stress, five was average stress, and ten was extreme stress. A statistically significant ( $p < 0.05$ ) difference in the amount of stress was found in integrated programs (7.9) compared to those in front loaded programs (7.1), and females (7.6) compared to males (7.1). Reported stress increased through the first five semesters, and then leveled off and remained constant throughout the remaining semesters.

There is evidence that a large percentage of students experience major life changes during their schooling (Chipas et al., 2012). In looking at the life events occurring in the last year, students most commonly reported as expected: started school, moved, quit a job, decreasing income. Others that were reported included: death of a family member (13%), marriage/legal union (12.2%), personal injury (9.4%), birth of a child (5%), and divorce (2.5%).

In their study, Chipas et al. (2012) reported that the five manifestations of stress that appear most often were agitation/anxious/irritable, too busy for things I used to do, annoyed by trivial things, digestive problems, and decreased ability to concentrate. The four most frequently used coping mechanisms reported were all maladaptive, including: using alcohol or other drugs (most used), giving up trying to deal with stress, giving up on coping, expressing my negative feelings, and criticizing myself. This study also



reported that 47% of SRNAs reported depression, and 21% of those SRNAs with depression had suicidal ideations, and those reporting depression and suicidal ideations also reported higher stress. There are a large percentage of students who are using negative coping methods and experiencing negative consequences of stress, and this could impact the health of the future CRNA workforce, as well as present and current future patient outcomes.

Increases in stress have been linked to negative coping behaviors (Tully, 2004), mental consequences (Edwards et al., 2010; O'Reilly et al., 2014; Wolf et al., 2015) and physical manifestations (Chipas et al., 2012; Tanaka et al., 2009). Stress reactions can negatively influence learning in several ways: "disturbed affect, change in adequacy of cognitive function, motor behavior impairment, physiological symptoms" (Kless, 1989, p. 79). Stress has been studied with regard to its sources and consequences and documented in the literature in nursing students (Goff, 2011; Hegge & Larson, 2008; Tully, 2004; Wolf et al., 2015), graduate students (El-Ghoroury et al., 2012; O'Reilly et al., 2014; Tanaka et al., 2009), and nurse anesthesia students (Chipas et al., 2012, Chipas & McKenna, 2011; Perez & Carroll-Perez, 1999; Phillips, 2010; Wildgust, 1986), but few studies seek to measure an overall level of stress (Chipas et al., 2012; Hegge & Larson, 2008; Kendrick, 2000). However, older studies in SRNAs have also well documented the sources and consequences of stress. The latest study conducted in 2010 (Chipas et al., 2012) measured level of stress with a one-item simple 10-point Likert scale, and did not report any psychometric properties associated with its use. The Perceived Stress Scale (PSS-4) was utilized in this study for its brevity and simple

assessment of stress level with four items and a reported tool coefficient Alpha of 0.77 (Warttig et al., 2013).

Currently 44 of the 114 nurse anesthesia program accredited by the Council on Accreditation (COA) offer doctoral degrees (COA, 2015), and this number will continue to grow in the coming years. Coping in the SRNA population has been researched with author-developed survey instruments (Chipas et al., 2012), by qualitative means (Phillips, 2010), and once with the PRQ (Kendrick, 2000). In the SRNA population, all the studies were published between 1986-2012. More nurse anesthesia programs are transitioning to doctoral level programs for entry into practice and are increasing in length, therefore SRNAs are going straight from bachelor's degrees to doctoral level work and having to cope for a longer period of time as doctoral programs are longer in length than the previous master's programs. More information is needed about the level of coping in this population. The Brief COPE (Carver, 1997) was chosen for its brevity and ability to determine a level of coping in SRNAs, where high scores indicate more positive coping and lower scores indicate less positive coping. SRNAs need positive coping mechanisms to help them transition through their educational endeavors, and a study to investigate the coping strategies utilized in this population could lead to educational implications for the promotion of positive coping habits and ultimately student success.

### **Retention/Attrition**

Six to fifteen percent of health profession students experience academic difficulties (Maize et al., 2010). Academic difficulties, clinical reasons, and personal reasons have all been cited as reasons for attrition in health professions, and leads to a

loss for students, institutions, professions, and the public. Program loss involves decreased tuition dollars. State supported schools utilizing public dollars make a significant financial investment per student for professional training. Attrition leads to loss for the public in terms of public money collected via taxes and loss of a provider to meet the public health care needs. Attrition is a waste of time, money, and effort for all parties (Dosch et al., 2008).

Before presenting the state of the science for attrition and retention in various health professions, the current models for retention in the literature are discussed, terms attrition and retention are defined, and a description of the various ways of measuring them is described. A commonly cited model for examining student retention is Tinto's Integration Model (Tinto, 1993). In this model, he suggests that the student's academic and social integration is important in predicting student retention. When discussing attrition and retention, clear definitions are essential. These will be described along with their means of measurement in the subsequent paragraphs,

Although often used interchangeably, persistence is considered a student measure, and retention is considered an institutional measure (Hagedorn, 2006). A decrease in the number of students due to lack of retention is termed attrition. A student graduates after completing the necessary courses for a degree. A person who graduates claims to be a graduate of one school regardless of enrollment at other schools prior to graduation; for example they may have completed transfer courses at other institutions. At the transfer school, they would be labeled as a dropout or non-retained student. Therefore, graduation rates and retention rates are not necessarily the same. Graduation rates used a variety of

time spans for measurements, and time spans have been reported from four to six years for colleges and universities, and community college time spans range from 3.5 to 5 years. So depending on how and when schools measure graduation rates, there can be great variability in the reported numbers. This variability makes it difficult to compare rates across universities.

All colleges and universities are required to report their retention rates to the federal and state governments as these rates are sometimes tied to the schools' funding (Hagedorn, 2006). There is not a standard formula for measuring retention. The United States Government requires colleges to report their graduation rates to prospective applicants, and they define it as

the percentage of full-time, first-time, degree-seeking enrolled students who graduate after 150 percent of the normal time for completion; defined as six years for four-year colleges..., and three years for two-year colleges (Hagedorn, 2006, p. 9-10).

This standard formula for graduation rate (not retention rate) required to be reported by all higher education institutions does not necessarily lead to improved transparency and the comparability of schools, because it excludes transfer students, part-time students, non-degree seeking students, student not entering in the fall, and students with undeclared majors.

Usually retention rates are simply calculated based on those enrolled from the first year to the subsequent fall of the following year, and only includes first-time, degree seeking students for only one year (Hagedorn, 2006). Although this is a short-term measure, colleges do report retention rates separately for full-time and part-time students.

There are other measures discussed in the literature including institutional retention, system retention, discipline retention, and course retention. Institutional retention reflects the number of students enrolled at the same institution from year to year. System retention is a means of looking at retention within a system, and takes into account transfer students, who choose to persist at another institution within the same system. Discipline retention is concerned with retaining students in a specific department. Lastly, course retention is the smallest measurement unit, and it is based on the number of students completing a course. All institutions do not consistently calculate this measure. Some use the first day of class while others use the number enrolled following add/drop period, and this difference can alter the results. The calculations of retention and graduation rates vary greatly, and exclude many students, and the literature on retention/attrition does not always clearly describe how researchers are calculating these variables in their research. Even though there is great variability in what is reported, there is no single measure for quantitative analysis of retention that will paint the whole picture of student persistence. Graduation rates indicate both a retention and progression.

The institutional variable of retention is similar to the student variable of persistence (Dosch et al. 2008). Attrition is the end result of institutional efforts to retain a student, and the opposite is the student's determination to persist to graduation. If the institution desires to retain a student, but a student desires to seek a different path outside of their current education system, then attrition will result. Thus, the concept of attrition must also take into consideration the student variable of persistence, and should be

considered in research as a variable for measurement or listed as a limitation as retention is also a result of student persistence.

Davidson, Beck, and Milligan (2009) first developed and tested a College Persistence Questionnaire (CPQ) in college students ( $n = 2,022$ ) from four different schools of higher education. The CPQ has six reliable factors including: institutional commitment ( $\alpha = 0.78$ ), degree commitment ( $\alpha = 0.70$ ), academic integration ( $\alpha = 0.81$ ), social integration ( $\alpha = 0.82$ ), support services satisfaction ( $\alpha = 0.74$ ), and academic conscientiousness ( $\alpha = 0.63$ ). They tested the predictive value of this tool in determining if freshmen would return as sophomores. Results for retention showed that institutional commitment ( $p < 0.001$ ) was the best predictor, and it was followed by academic conscientiousness ( $p < 0.01$ ), and academic integration ( $p < 0.05$ ).

Johnson, Johnson, Kim, and Mckee (2009) administered a Personal Background Preparation Survey (PBPS) to nursing students at two nursing schools to identify early which nursing student were at risk for attrition. Researchers collected the adverse academic status events (AASE) from student records at the end of each academic year. An adverse academic status event was the presence of any of the following on the student's record: dismissal due to academic record, fall semester warning, insufficient grades, leave of absence, switch to part time, switch to alternate pathway, remedial assistance, repeat course or courses, spring semester warning, suspended from the program, withdrawal from course, and withdrawal from program. The PBPS (47 items and 64 items) was administered four separate times between 2004 to 2006 to 1,480 nursing students. The Cronbach's alpha for the 47-item PBPS was 0.77, and the

Cronbach's alpha for the 64-item PBPS ranged from 0.71 to 0.80. PBPS assessed for ten risk categories including: personal, academics, self-concept, support, financial, leadership, discrimination, community service, and long-range goals. Researchers found that a one standard deviation ( $p < 0.05$ ) increase in PBPS risks multiplied the odds of first or second year AASE by 150% after controlling for school affiliation and underrepresented minority student status.

The terms associated with retention and attrition were defined. The ways of calculating retention rates, graduation rates, and other measures as well as some of the issues impacting the accuracy of these rates will be discussed. Attrition rates are of interest to educators, to professions, students/consumers, and educational accrediting bodies as an important educational process outcome (Dosch et al., 2008). Different types of students have been examined in studies of attrition and retention, but for this discussion, medicine and pharmacy students were chosen along with nurse anesthesia students for several reasons. All three of these disciplines require graduate training, and an expansive medical knowledge inclusive of anatomy, physiology, principles of pharmacology, and medical tests across the life span. The latest attrition rates and most common reasons for attrition will be reported for each discipline. For each discipline, a description of the strategies utilized to decrease attrition will be provided, along with any supporting research. These strategies take three approaches toward promoting retention and decreasing attrition including prevention via student selection utilizing cognitive and non-cognitive traits, early detection, and remediation.

**Pharmacy.** The rate of attrition from U.S. pharmacy schools over the past five years averages 10.7% per class (American Association of Colleges of Pharmacy (AACCP), 2014), which is slightly higher than for nurse anesthesia programs. Unlike nurse anesthesia programs, schools of pharmacy take several approaches to increasing retention and decreasing attrition and these are well documented in the literature. These include preventive measures, early detection strategies, and remediation approaches (Maize et al., 2010). The basis for requiring these strategies is usually based on GPA and is usually outlined in the school's handbook. A minimum GPA of 2.0 was required for students to progress and to graduate in 66% of U.S. pharmacy schools (Poirier, Kerr, & Phelps, 2013). Research shows academic difficulty occurs most often during the first and second years of the curriculum with greatest attrition in the first year (Houglum, Aparasu, & Delfinis, 2005). Students typically leave due to changes in career preference, unexpected personal developments, or poor academic performance (Houglum et al., 2005).

Preventive measures typically begin with admission standards and selection processes that seek to only admit the most highly qualified students (Maize et al., 2010). There has been much research done on the predictability of both cognitive and non-cognitive traits related to academic success. With cognitive traits, most schools use Pharmacy College Admission Test (PCAT), cumulative GPA, science GPA, and possession of prior degree to predict success (Houglum et al., 2005). There are studies that show the predictability of each of these in determining success, but there are also studies that demonstrated no predictability. Consistently most evidence supports using pre-pharmacy math and science GPA (Houglum et al., 2005).



Research on non-cognitive traits have sought to suggest the predictability of academic success in terms of student motivation, self-efficacy, gender, prior degree, time management skills, and study skills. Prior bachelor's degree and status as a transfer student were associated with success, and postulated to be related to nonacademic characteristics including: motivation, social stability, and communication skills (Houglum et al., 2005). Higher achieving students possessed greater self-efficacy, and lower achieving students also were more extrinsically motivated. Poor educational outcomes are associated with those students who overestimate their academic ability related to either optimism or defensive denial of true abilities (Carroll & Garavalia, 2004). Effective time management strategies increased academic performance (Sansgiry, Kawatkar, Dutta, & Bhosle, 2004).

Students at transition points such as from undergraduate to graduate programs usually require some academic assistance. As previously discussed, many universities have academic assistance programs. Some universities also offer supplemental instructional programs as a type of academic assistance program. This proactive system offers academic support in advance of academic problems. Some schools target high risk courses (ones with high percentage of failure or withdrawals), and have found an increased retention and higher grades in its attendees (Congos & Schoeps, 1993). Other schools have an in-house student counselor to provide individualized assistance to students (Sansgiry et al., 2004). At Auburn University pharmacy school, students receive a week-long 'learning to learn' orientation that introduces them to the demands of its program and approaches to learning. This has not been evaluated within this pharmacy

school, but it is structured after a learning-to-learn camp, which has been effective in increasing retention (Maize et al., 2010).

Many schools utilize early detection strategies. Some of these include: GPA alerts, criterion blocks, progression examinations, and year-end assessments. With GPA alerts, a notice is sent to students and their advisors when GPAs approach the minimum required for progression. Pacific University of Oregon's pharmacy school requires students to achieve a set minimum criterion of 90% on biweekly exams to avoid reexamination; this approach allows for quick identification of at risk students. Other schools utilize progression or year-end examinations to assess students' knowledge, and results affect progression and can be utilized to identify students in need of remediation (Maize et al., 2010).

Remediation can take many forms, and most pharmacy school handbooks did not address remediation. In the schools that addressed remediation, most outlined that a course could only be retaken once. Other forms of remediation included reduced course load and required summer school (Poirier et al., 2013). There are no data to suggest that repeating a course is effective in helping students with learning issues. When remediation plans are individualized to the needs of a particular student in an interactive format within a meaningful context, then the impact is greatest (Johnson, 2004). Many pharmacy schools use summer restudy programs in various formats ranging from self-study, re-examinations, and highly structured study programs. The benefit of summer restudy is the ability to address student needs on a more individual level as there are usually a smaller number of students involved. Some other pharmacy schools also offer an option for a

reduced program load allowing students to complete two academic years in a three year period, but no studies have been done evaluating its effectiveness. Pharmacy schools also use advance practice progression examinations that ensure students are clinically and professionally competent to progress (Maize et al., 2010).

The permissibility of the student to progress in their program while on probation varied by school. Some schools restricted student activities while on probation (Poirier et al., 2013). The most common criterion for dismissal was the number of times a student was placed on probation with two probation incidences as grounds for dismissal. Most strategies utilized in pharmacy schools do not have research evidence for their effectiveness in addressing attrition, but one is based on research (the learning to learn orientation). Private pharmacy schools have less attrition, and offer more remediation (Poirier et al., 2013), which indicates there are benefits to remediation for the student.

**Medicine.** In every medical school attrition is a natural occurrence, and approximately 10-15% of an entering class will not graduate with their cohort (Tekian, 1998), but less than 4% will fail to graduate within ten years (Garrison, Mikesell, & Matthew, 2007). The latest results from the Accreditation Council for Graduate Medical Education reported that 2.4% of residents would fail to complete their program (Ramachandran, 2013). Medical schools and residency programs also utilize several strategies to address retention and attrition with similar efforts as previously discussed in terms of preventive measures, early detection strategies, and remediation.

Half of those who drop out of medical school do so for nonacademic reasons. Non-academic reasons for attrition in the literature included personal reasons related to

family and health, family reasons, personal reasons, change in career interests, and high scores on the Beck Depression Inventory (Dyrbye, Thomas, & Shanafelt, 2010).

Research shows 11% of medical students have serious thoughts of dropping out each year, and half of those students who seriously think about dropping out will. Low scores for personal accomplishment, lower mental and physical quality of life scores, and having children were independent predictors of students with serious thoughts of dropping out. There was no association found between ethnic groups, gender, relationship status, and serious thoughts of dropping out (Dyrbye et al., 2010).

Unlike pharmacy schools, most medical schools utilize some form of pass/fail designation (Magarian & Mazur, 1990). Research found that variation of pass/fail grading systems could not identify students who narrowly passed from others, and this leads to a loss of information on levels of academic achievement (Gonnella, Erdmann, & Hojat, 2004). A student's ranking in lower academic achieving groups was found to be correlated with delayed graduation, and a probability for attrition. Grades must be able to differentiate the students who need remedial education and those who do not, and this is an important feature being overlooked in medical education research with the use of pass/fail grading systems. Evidence shows better performance of residents in schools with number grades compared to those with pass/fail grading systems (Moss, Deland, & Maloney, 1978). There is no evidence showing a change in student anxiety with pass/fail grading systems (Yarbro, 1982).

Many promising techniques for selecting medical students have been researched but none have yielded methods of proven validity (Gough, 2004). The longstanding use

of the Medical College Admission Test (MCAT) for selection of medical students remains useful as a valid indicator of performance in medical school and/or residency (Callahan, Hojat, Veloski, Erdmann, & Gonnella, 2010). This is one useful tool to look at in the selection process of the best and brightest for medical school admission in an attempt to prevent the need for future remediation.

Non-cognitive attributes have been associated with academic performance including approaches to studying, self-assessment of academic skills, motivational beliefs and emotions, presence of mentoring, and negative comments in letters to the dean for admission. Researchers found a definite association between learning approaches (deep, superficial, and strategic) and cumulative GPA. Higher grades were seen in students using strategic learning approaches by the end of the first year. A deep learning approach was shown as beneficial and surface learning approach was associated with poorer performance (Ward, 2011).

A medical student's motivational beliefs and achievement emotions contribute to their academic achievement. Self-efficacy beliefs and task value beliefs were negatively associated with course anxiety and boredom, which were negatively associated with course grades (Artino, Rochelle, & Durning, 2010). "At risk" students have difficulty accurately assessing their academic skills and are often afraid to seek help (DeVoe et al., 2007). Students with physician mentors had less academic difficulty. Advisors assigned by administration had an adverse effect on the advising/mentoring process. This research suggests that advising/mentoring strategies should be evaluated (Tekian, Jalovecky, & Hruska, 2001). One retrospective study found the presence of negative comments about a

student in the dean's letter yielded a significant correlation with future problems (Brenner, Mathai, Jain, & Mohl, 2010).

Medical schools have utilized multiple approaches for improving academic success, and have tested one of these approaches. The one tested strategy was a six-month pilot study where at-risk students participated in study groups facilitated by upper-level medical students, but found no significant difference in the study group and the matched group (DeVoe et al., 2007). Like pharmacy schools, some medical schools also utilized reduced load programs allowing two years to complete the first year. At Indiana University School of Medicine, they focus on increasing their students' science foundation, and developing study and time management skills (Ficklin, Hazelwood, Carter, & Shellhamer, 1985). Sixty-two medical schools use competency exams to detect deficiency, develop remediation plans, and retest students (Maize et al., 2010). Medical schools report difficulty in identifying students with clinical problems as they rotate with various clinicians who are not trained teachers, and these students who graduate will need remediation in professional practice (Sayer, Chaput De Saintonge, Evans, & Wood, 2002).

As mentioned for pharmacy students, a transition point as from a medical student to an intern is associated with challenges, a change in identity and new responsibilities and requirements that can lead to stress, burnout, mental health issues, and poor patient care (Teo, Harleman, O'Sullivan, & Maa, 2011). Common struggles in interns revolve around lack of self-reflection and improvement, poor organizational skills, underdeveloped professionalism, and lack of medical knowledge (Lyss-Lerman, 2009). A

transitions course was developed at University of California San Francisco School of Medicine with the following goals: broad review of clinical knowledge, opportunity to practice clinical and technical skills, prepare student to succeed on a personal level, and discuss personal and professional topics. It used a variety of formats including workshops, lectures, small group discussion, large group discussion, panel discussion, and practicum. Students felt the course improved their preparation for internships, and acknowledged an improvement with communication skills, maintenance of own well being, and understanding of available resources. The feedback from students supports the need for improved preparedness for this transition with improving skills of maturation, reflection, professional development, and communication. No post course results in students have been tested including the effects on continued confidence and preparedness once an intern, the future development of mental health issues, depression, and/or anxiety, impact on resident attrition, outcomes in patient care as these results would require a longitudinal study (Teo et al., 2011).

Reasons for attrition in medical schools have not been well documented, but academic standing is not the most common reason cited. Personal reasons, family reasons, and psychological morbidity have also been documented as reasons for attrition (Dyrbye et al., 2006; Fogleman & Vander Zwagg, 1981). Many of the studies chronicle the problems of distress and attrition in medical students and residents, but few explore direct causes, or offer or test solutions to these issues facing medical students (Dyrbye et al., 2006). Addressing attrition is important, because personal, institutional, and financial costs associated with attrition are steep. Cost of attendance for a medical student can

reach \$68,000 per year. Institutions are supported with state funds and faculty clinical practice, and spend approximately \$70,000 to \$90,000 per medical student per year (Jones & Korn, 2010). Emotional and psychological consequences of failure will cause additional problems and inhibit one's ability to focus on learning content (DeVoe et al., 2007), and early detection strategies will be most important for academic success.

**Nurse Anesthesia.** From a survey of anesthesia program directors (n = 62), the last reported attrition rate was 9% (Dosch et al., 2008). Attrition in nurse anesthesia programs has been attributed to personal reasons (46%), clinical reasons (17%), academic reasons (21%), and combination of reasons (16%) (Mathis, 1993). However, there are conflicting reports as to the main reason for attrition. Personal reasons, academic and clinical reasons, and improper socialization have all been cited (Mathis, 1993; Ouellette, Courts, & Lincoln, 1999; Waugaman & Aron, 2003). Common reasons for attrition included: withdrawal, academic dismissal, and clinical dismissal (Dosch et al., 2008). Research found that higher attrition rates occurred in programs of longer duration ( $r = 0.276$ ,  $R^2 = 0.076$ ,  $p = 0.031$ ), but were not associated with the size of the program, or the program director's length of experience. Research shows most students who did not complete the program left during the first 12 months, but approximately 25% left after the first 12 months (Mathis, 1993). Mathis (1993) further attributed dropping out to the stress of balancing the multiple roles of family, school, and work.

There was no literature on standards used for academic progression, probation, or dismissal across nurse anesthesia programs. Prevention of attrition by utilizing admission criteria to select the most highly qualified applicants is one approach. Admission criteria



can vary from program to program, and the criteria utilized by most programs across the United States includes GPA, science GPA, Graduate Record Examination (GRE) scores, and critical care nursing experience. Additional requirements may include letters of recommendations and applicant interviews. Research shows that GPA has the greatest value in predictability of a student's ability to progress academically, and it was followed by science GPA, GRE, and number of years of critical care experience. As years of critical care experience increased, the student's anesthesia school GPA decreased (Burns, 2011). Non-cognitive traits that have been researched in nurse anesthesia students included self-awareness of learning styles, emotional intelligence, situational awareness, and high trait anxiety (Collins, 2013; Garcia-Otero & Teddlie, 1992; McEwan & Goldenberg, 1999; Wright & Fallacaro, 2011). Of these, self-awareness of learning styles improved performance, but only high trait anxiety has been a predictor of academic success (Garcia-Otero & Teddlie, 1992; McEwan & Goldenberg, 1999). There are no studies that look at the non-cognitive traits of motivation or self-efficacy in this population.

There is no literature outlining early detection strategies or the remediation policies or practices utilized in nurse anesthesia programs. The COA for Nurse Anesthesia Programs does not address remediation practices or policies, and their presence and structure will vary and be determined by each individual program. One article addressed academic success and persistence in graduate nursing students and was not anesthesia specific, and it suggested the provision of financial support, emotional and moral support, technical support, and the encouragement of mentorship to facilitate

degree completion (Veal, Bull, & Miller, 2012), but the effectiveness of these strategies in graduate nursing programs or nurse anesthesia programs have not been tested.

The use of progression or year-end examinations in nurse anesthesia programs is not documented in the literature. The National Board on Certifying and Recertifying Nurse Anesthetists (NBCRNA) offers a Self-Evaluation Exam (SEE) to determine areas of weakness prior to taking the National Certifying Exam (NCE), but this is usually administered later in anesthesia training. Most anesthesia programs require daily clinical evaluations to be completed, and these could be used to detect early problems in the clinical arena. However, a 2014 article demonstrates the questionable validity of these tools, and thus questions the validity of clinical evaluation tools used in programs to detect students in jeopardy (Collins & Callahan, 2014). Remediation strategies in nurse anesthesia programs are lacking in the literature, but these students will at least likely have those available at a university level such as an academic assistance programs. Academic assistance programs are present in approximately 90% of public and 60% of private institutions. These programs focus on building confident, motivated learners who can concentrate, set goals, self-assess their learning, synthesize information, and solve problems with successful time management, study, and test taking skills (Maize et al., 2010). Programs either focus on developing more effective learners or provide content-specific learning tools (Zan, 2000; Zeegers & Martin, 2001).

Within these disciplines there is no uniform strategy to address attrition and improve retention, and for the most part the strategies employed are not based on research or tested for effectiveness. All of these disciplines list similar causes for

attrition, but no one approach addresses the multiple causes of attrition seen in these students. None of these disciplines provide research on the cause and effects of attrition. Most of the research and literature on attrition in each of these disciplines chronicles the rates of attrition, and examines the superficial reasons (personal reasons) for attrition as well as traits that may affect academic success. The nurse anesthesia literature is most lacking when compared to other disciplines. It provides no literature on early detection strategies or remediation practices across all the programs in the discipline. Medicine and pharmacy acknowledge that points of transition require additional assistance, and have made efforts to facilitate the student's transition. Despite the lack of research and publications in nurse anesthesia on attrition and retention, their rates of attrition are in line with other health professions. To move from chronicling the presence and superficial reasons for attrition, research within these disciplines needs to be done truly looking at attrition, which is the result of the interchange between the institution and its retention strategies, and the student and their desire and ability to persist.

To study attrition/retention most accurately would require a longitudinal study. A longitudinal study was not practical for the scope of this research for several reasons. The time it would take exceeded the time limits of this study. It would require collecting participant information and collecting data from their respective schools, then matching the two. For this study, intent to persist will be assessed using three intent to persist items (Khalkhali, Sharifi, & Nikyar, 2013) with higher scores indicating a decreased intent to persist. A greater understanding how all the variables (stress, coping, social support, and intent to persist) are related could lead to further research, intervention studies, and

educational adjustments to decrease attrition and promote SRNA success in nurse anesthesia programs.

## CHAPTER III

### METHODS

This chapter lists the research questions, describes the methodology, study processes, and analysis plans for this study of stress, coping, social support, and intent to persist in student registered nurse anesthetists (SRNAs).

#### **Specific Aims/ Purpose**

Social support is important to help students cope with stress for several reasons: to affect stress in students, enhance learning, promote student success, produce improvement in strategies that can be carried into practice, and enhance patient safety and outcomes. When nurse anesthesia students begin their educational endeavor to become a Certified Registered Nurse Anesthetist (CRNA), they engage in a major life transition. There is a high likelihood that at some point during this endeavor SRNAs experience stress. This study utilized Transition Theory to investigate the level of perceived stress and social support in SRNAs, and how these relate to a student's level of coping and intent to persist in their program. Currently, literature exists on transitions in nursing, stress in the anesthesia community, and academic success in the anesthesia community. However, no studies could be located that utilized random sample selection, and that studied the intent to persist and the relationship of stress, social support, and coping in the SRNA population with validated and reliable measurement tools for stress, social support, and coping during this major life event. Therefore, the aims of this study were to

examine: (a) the students' perceived social support (b) stress in SRNAs, (c) coping, and (d) the students' intent to persist. With greater understanding of the relationship between the variables of stress, social support, coping, and intent to persist in their education, educational interventions can be developed to help students as they transition from registered nurse (RN) to CRNA. SRNAs who develop better coping skills can take well-developed positive coping skills into their professional practice. This will result in CRNAs who are better able to cope with the daily stress of being a practicing anesthetist and ultimately improving the health of the CRNA workforce.

### **Research Questions**

1. How do stress, social support, degree awarded, and type of program affect coping and intent to persist in SRNAs?
2. How does the anesthesia students' social support system change during the program?
3. What support mechanisms do anesthesia programs offer students?
4. What support mechanisms do students want from anesthesia programs?
5. How do the students prepare their social support systems prior to the beginning of anesthesia school?

### **Conceptual Definition(s)**

- Stress: Defined as “a constraining force or influence” (Stress, 2012, para 1).  
Stress is also “a physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation” (Stress, 2012, para. 3).

A state of stress is “one of bodily or mental tension resulting from factors that tend to alter an existent equilibrium” (Stress, 2012, para. 4).

- Social support: Defined as:

interpersonal transactions that include one or more of the following: the expression of positive affect of one person toward another; the affirmation or endorsement of another person’s behaviors, perceptions, or expressed views; the giving of symbolic or material aid to another (Kahn, 1979, p. 85).

- Coping: The way individuals respond when they are confronted with difficult or stressful events.
- Intent to persist: Is a student’s self-determination and motivation that reflects intention for continued school attendance.
- Type of program (integrated or front loaded): Integrated programs have a few weeks of intensive classroom experience, but students begin their clinical experience early in the first semester of their anesthesia program coursework. Therefore, students in integrated programs are completing classroom and clinical requirements simultaneously (Chipas et al., 2012). Front loaded programs require the students to complete some course work prior to clinical experience. The length of time for course work upfront can vary by school and range from one semester to a full year.
- Program degree awarded: The degree awarded at the completion of the nurse anesthesia education program. At the end of the program, a student will be awarded a degree on a master’s level or practice doctoral level.

- Class size: The number of total students in the participant’s cohort including self.
- Program length: The minimum number of months from the beginning of the program to completion.
- Time in program: Determined by response on demographic tool where students respond with the number of months they have been in their anesthesia program beginning with the first day of full time study of coursework in an anesthesia curriculum, and not including prerequisites or graduate coursework taken prior to formal matriculation into an anesthesia program.
- Type of critical care experience: The type of critical care unit in which experience was gained as a Registered Nurse (RN).
- Years of critical care experience: The number of years worked in a critical care setting as a RN.
- Relocation: Relocation is a significant residence move by an individual in which the individual perceives that it is a move that is “far enough that [they] can no longer see [their] old friends easily every day” (Weiner & Hannum, 2012, p. 665).

**Operational Definition(s)**

- Stress: Students completed the four-item Perceived Stress Scale (PSS-4) that measures students’ perceived stress. (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988). Item responses were on a five-point Likert scale ranging from 0 (never) to 4 (very often) for each item. Positive items (number two and three) were reversed coded. Responses from the four items were summed, yielding a score range from 0-16 with higher scores indicating more stress. A



cutoff for low, moderate, or high stress was not indicated in the literature.

However, Cohen and Williamson (1988) reported a mean score of 4.49 with a standard deviation of 2.96 in a sample of 2,378, and Warttig et al. (2013) reported a mean score of 6.11 with a standard deviation of 3.14. The tool takes less than five minutes to complete, and PSS-4 results correlate well with the PSS-14 and PSS-10 results. This tool was designed for community samples with at least a junior high education. The PSS-4 has been found to be a reliable tool when time is limited and the number of items need to be minimized in an effort to increase response rate. The PSS-4 has a tool coefficient Alpha of 0.77 (Warttig et al., 2013).

- Social support: Students completed the 15-item Personal Resource Questionnaire (PRQ2000) that measures perceived social support (Weinert, 2003). Item responses were on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Item responses were summed up to yield a total score. Scores can range from 15-105 with higher scores indicating higher levels of perceived social support. In a sample of women between the ages 35-65 with chronic illness living in a rural location mean scores ranged from 78.91-86.07 (Weinert, 2003). This tool has been used with samples of university alumni (Weinert & Brandt, 1987), and women with chronic illness in a rural area (Weinert, 2003). It takes about ten minutes to complete. This tool has a coefficient Alpha range of 0.872-0.927.

- Intent to persist: Students completed three items to assess their intent to persist in their education program (Khalkhali, Sharifi, & Nikyar, 2013). Responses were on a seven-point Likert scale ranging from 1 (not at all in agreement) to 7 (completely in agreement). Item responses were summed up to yield a total score ranging from 3-21 with higher scores indicating a decreased intent to persist. Khalkhali Sharifi, and Nikyar (2013) reported a coefficient Alpha of 0.78 with these three items. This tool has been used in a sample of ninth grade Iranian boys.
- Coping: Students completed the 28-item Brief COPE (Carver, 1997) that measures the use of positive and negative of coping. Items were scored on a four-point Likert scale ranging from 1 (I haven't been doing this at all) to 4 (I have been doing this a lot) indicating the frequency that the student used each strategy. Maladaptive or negative items (17-28) were summed to yield a score that ranged from 4-48 with higher scores indicating more maladaptive coping. Adaptive or positive items (1-16) were summed to yield a score range from 4-64 with higher scores indicating more positive coping.

This questionnaire measures 14 conceptually different coping reactions (Carver, 1997). The 14 subscales with their indicated reliabilities include: active coping ( $\alpha=0.68$ ), planning ( $\alpha=0.73$ ), positive reframing ( $\alpha=0.64$ ), acceptance ( $\alpha=0.57$ ), humor ( $\alpha=0.73$ ), religion ( $\alpha=0.82$ ), using emotional support ( $\alpha=0.71$ ), using instrumental support ( $\alpha=0.64$ ), self-distraction ( $\alpha=0.71$ ), denial ( $\alpha=0.54$ ), venting ( $\alpha=0.50$ ), substance abuse ( $\alpha=0.90$ ), behavioral disengagement ( $\alpha=0.65$ ), and self-blame ( $\alpha=0.69$ ). These reliabilities indicate the internal reliability of the

abbreviated COPE, and were tested in community residents (n=168) affected by Hurricane Andrew, and with the following sample characteristics: 66% female, 40% non-Hispanic Whites, 34% African Americans, 17% Hispanics, and 5% Asian. Total scale reliability in English was calculated with a Guttman split-half coefficient, and was reported at 0.82 in a sample of Kenyan caregivers by Kimemia, Asner-Self, and Daire (2011). The factor analysis yielded nine factors with eigenvalues greater than 1.0, and accounted for 72.4% of the variance. These nine factors included: substance abuse, religion, humor, behavior disengagement, venting, self-distraction, acceptance (one of the two acceptance items), support (emotional support and instrumental support), and coping (active coping with the other one of the two acceptance items, planning, and positive reframing). The factor structure is not perfect, but results were similar to that reported for the full inventory. Meyer (2001) proposed a simpler two-factor model that used items 1-16 as adaptive, and items 17-28 as maladaptive. These factors yielded coefficient Alphas of 0.81 and 0.48, respectively. When Meyer eliminated the two subscales of venting and self-distraction that did not positively contribute to internal consistency, then the maladaptive Alpha increased to 0.57.

- Type of program (integrated or front-loaded): Determined by response on demographic tool. Students were asked to choose one.
- Time in program: Determined by response on demographic tool where students responded with the month and year in which they began their anesthesia program beginning with the first month of full time study of coursework in an anesthesia

curriculum, and not including prerequisites or graduate coursework taken prior to formal matriculation into an anesthesia program. When calculating time in the program, the start program date was assumed to be at the 15th of the particular month and year that was indicated by the participant to the survey start date.

- Program degree awarded (master's or practice doctorate): Determined by response on tool from the student responses.
- Class size (including self): Determined by response on tool from the student responses.
- Grade point average (GPA): Participants self-reported their GPA in prior undergraduate nursing course work.
- Type of critical care experience: The participant selected the intensive care unit (ICU) that best described their critical care experience setting from the following list: ICU, Cardiac ICU, Surgical Trauma ICU, Neonatal ICU, Pediatric ICU, Neurological ICU, Surgical ICU, Trauma ICU, Cardiothoracic ICU, Medical ICU, Pulmonary ICU, Burn ICU, Cardiovascular ICU, Coronary Care Unit, or Other (specify).
- Years of critical care experience: Determined by the number of years a student self-reported working in a critical care setting as a Registered Nurse in whole numbers on the survey tool.
- Gender: Participant self-selected either male or female.
- Age: Participant entered their current age in whole years.

- Marital status: Participant selected one of the following: married, single, divorced, widowed, or cohabiting.
- Children: Participant selected one of the following: children or no children.
- Children Living Arrangements: Participant were asked the following if they indicated they have children: Do the children live with you? If participant selected yes, he/she then was asked to list the ages of the children living with them. Participant were also able to select no or sometimes. If sometimes was selected, then the participant was asked how much/often.
- Relocation for anesthesia school: Relocation is a significant residence move by an individual in which the individual perceives that it is a move that is “far enough that [they] can no longer see [their] old friends easily every day” (Weiner & Hannum, 2012, p. 665). Participant selected either yes or no with regards to a significant residence move as described.
- Region in which the anesthesia program is located: Participant selected the region in which their anesthesia program was located from a list based on the American Association of Nurse Anesthetists’ (AANA) delineation of regions. The AANA regions are broken down as follows: Region 1 – Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, and Vermont; Region 2 – Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia; Region 3 – Illinois, Indiana, Michigan, and Wisconsin; Region 4 – Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, and South Dakota; Region 5 –

Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming; Region 6 – Delaware, District of Columbia, Maryland, Ohio, and Pennsylvania; Region 7 – Alabama, Florida, Louisiana, Mississippi, and Texas.

## **Methods**

**Research Design.** A correlational, non-experimental study was conducted using a cross-sectional design via an online survey.

**Setting.** An email inviting students to participate was sent to a random sample of associate members of the American Association of Nurse Anesthetists (AANA). Associate members were SRNAs who join the AANA, but as associate members they do not have voting privileges afforded to full members. AANA emailed the link for the survey to the student's email address on file to 3,000 randomly selected student associate members. The participants then clicked a link that directed them to a Qualtrics survey that they completed at the time and in the location of their choice. Emails were sent out during the summer semester. There was a four-week response time, and a reminder email was sent out seven days prior to the end of survey window.

**Sample and Sampling Plan.** The target population included students enrolled in a nurse anesthesia program accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA). An email was sent to 3,000 randomly selected students who are associate members of the AANA. All those who completed the survey within the four-week time frame were included. The inclusion criterion included all associate/student members of the AANA who read English. This included students in

various points in their anesthesia program. Students who were currently enrolled in an accredited nurse anesthesia program at the time of the survey were eligible to participate, and those who were not currently enrolled following withdrawal, dismissal, or graduation from their anesthesia program were excluded. Also excluded were those students who are not associate members of the AANA, and those students who do not have email.

A power analysis was done to determine the needed sample size. At a significance level of two-sided  $\alpha$  of 0.0167 with four variables at a power of 80%, a medium effect size of *Cohen's*  $f^2 \geq 0.15$  (Cohen, 1992) required a sample of  $n = 73$  for a multiple linear regression (Faul, Erdfelder, Buchner, & Lang, 2009). Therefore, the target sample size for this study was at least 73. An invitation was sent to 3,000 of 5,900 associate/student members of the AANA. A similar study that also utilized an online survey tool emailed to associate AANA members conducted in 2010 surveyed 5,365 students with a return of 1,374 completed surveys for a response rate of 25% (Chipas et al., 2012). In 2014, AANA reported a current response rate trend for their surveys of 10% (AANA Electronic Survey Policy and Order Form Version 12-11-14, 2014), and 10% of 3,000 would be 300. Even though this study returned a response rate of 6.8%, which is lower than response rates reported in previous studies and by the AANA, the sample size was sufficient for data analyses based on the power analysis.

**Protection of Human Subjects.** An Institutional Review Board (IRB) application was submitted to the University of North Carolina at Greensboro (UNCG) IRB prior to the study for approval and the study was determined to be exempt from further review according to the regulatory exemption category (2. Survey, interview,

public observation) under 45 CFR 46.101(b) (see Appendix A. IRB Approval). The ethical considerations included psychological effects from reflecting on personal stress and coping, maintaining confidentiality, and secure data storage. When the students completed the survey, the data were collected without identifying information such as name, physical address, internet address, and school name to maximize confidentiality. By completing the survey, the students indicated their consent, and individual consent forms were not obtained to further promote anonymity. The survey was administered through Qualtrics via an anonymous survey link. The survey link was emailed to the participants via an invitational email sent by the AANA, so the investigator did not have access to email addresses of those invited. To minimize that non-SRNAs would happen upon the survey via an internet search engine such as Google, Yahoo, or Bing, the survey was designed to prevent indexing this survey by internet search engines, and internet search engines would not be able to locate the survey. Qualtrics stored the data results on secure servers equipped with firewalls until accessed by researcher with correct login and password protection. Data were uploaded to SPSS, and the SPSS data file was password protected. Data files were also stored on a password protected USB drive.

**Instruments.** A researcher designed demographic tool was used to collect the following information: gender, age, marital status, relocation for anesthesia school, geographical region, previous intensive care nursing experience, type of anesthesia program enrolled, number of students in their anesthesia class cohort, number of months completed in their program, total length of anesthesia program, and degree awarded at the



end of their program. The total time for survey administration was estimated to be less than 15 minutes for all four parts.

The PRQ2000, PSS-4, Brief COPE, and the intent to persist items were followed by the demographic tool, which included program characteristics, personal characteristics, and questions about any children the participant had. The last questions in the survey instrument were the open-ended questions on social support. A copy of the survey instrument is available as an appendix (see Appendix B. Survey Instrument). Permission to use the PRQ2000 was obtained (see Appendix C. PRQ2000 Permission), and the other tools were available for use in academia and education without permission.

Several strategies were implemented to increase the response rate. The background of the Qualtrics screen was white with a blue border with black words. Questions were bolded and responses were not bolded as research indicates this color scheme increases response rate (Fanning, 2005). The tools were presented in Qualtrics in matrix format and required a response to proceed to the next one to avoid missing data. Several questions did not require a response. The questions regarding the living arrangements of participant children only requested and did not require a response from participants, and open-ended questions also did not require a response. In comparison, the required response questions yielded a sample size of 204, and the number of participants responding to the four open ended questions not requiring a response ranged from 155-187 participants. There was a tracking bar on the computer screen to show the respondent's progress.

**Data Collection.** The AANA was contacted via the AANA Electronic Survey Policy and Order Form Version 12-11-2014 (2014), and was compensated \$1,700.00 for the distribution of the electronic survey. The survey was presented via Qualtrics, and a link was provided by the AANA via an email to 3,000 randomly selected AANA associate members. The email provided basic information about the nature of the study, and invited the email recipient to participate if they were currently enrolled in an accredited nurse anesthesia program. Consent was implied by the submission of a completed survey. The survey was presented as previously described. Completed data were saved in the survey program. To eliminate data entry error, the data were auto-converted into SPSS version 23.0. There were no respondent identifiers with these data to ensure confidentiality.

**Data Analysis Plan.** Prior to analyzing data with SPSS version 23, the data were carefully screened. The categorical data, type of program, and type of degree program were checked to ensure all cases had values that would lead to coded values (Mertler & Vannatta, 2002). In order to limit missing data, the survey forced entry in order to proceed to the next question. Data were checked for outliers and incorrect data (Mertler & Vannatta, 2002). However due to the forced entry response multiple choice survey design, the only items that required the participants to manually enter a response were questions regarding age and number of students in their class. These two questions limited the response to a numeric response with no decimal places, and a minimum of 21 was set for the question about participant's age, and minimum of 1 was set for the question about

class size. These questions were screened for outliers, but it was difficult to determine if outliers were the result of a typographical error or simply an outlier. The data were screened further for normality, linearity, and homoscedasticity. Normality was checked by examining histograms, normal Q-Q plot, and the results of Kolmogorov-Smirnov tests.

The categorical variables, program type and program degree were transformed to appropriate indicator variables. For the continuous variables, assumptions were checked with residuals. Residuals were examined for independence by confirming independent observations as a product of the study design. Next, residuals were checked for normality in several ways. These include examining deleted residuals for outliers, examining P-P plots, and running Kolmogorov-Smirnov test. Constant variance was inspected with a residual plot for deleted residuals versus predicted values for heteroscedasticity. Linearity was assessed with a residual plot by plotting deleted residual values against predicted values, where a curved pattern indicated nonlinearity. Variance Inflation Factors (VIFs) were used to check for multicollinearity. It was desirable that VIFs be low, because values greater than seven imply possible multicollinearity, and values greater than ten imply severe multicollinearity. If there was evidence that assumptions were not met, then data transformation such as computing the square root, taking logs, or computing the reciprocal of variable were considered to stabilize the variance and achieve linearity and normality.

After the data were screened and major assumptions checked, descriptive statistics were used to analyze the results for each of the demographic variables as well as

each tool's total score. The following statistical approaches were taken to specifically answer each research question. The first research question was: How do stress, social support, degree awarded, and type of program affect coping and intent to persist in SRNAs? Analysis used a Multivariate Analysis of Covariance (MANCOVA) after ensuring random sampling, adequate sample size with more cases in each group than the number of continuous dependent variables. Data were screened for univariate or multivariate outliers, multivariate normality, multicollinearity, linear relationship between dependent variables, and homogeneity. It was also ensured that data were independent and checks for normal distribution and equal variance for continuous variables were done (Polit, 2010). Additional multiple linear regression analyzes were completed to examine the statistically significant relationships between variables indicated in the MANCOVA results.

Four open-ended questions were asked at the conclusion of the survey, and they are as follows. How does the anesthesia students' social support system change during the program? What support mechanisms do anesthesia programs offer students? What support mechanisms do students want from anesthesia programs? How did the student prepare the social support system prior to the beginning of anesthesia school? These questions were analyzed using qualitative content analysis (Hsieh & Shannon, 2005). The student responses were entered into an Excel spreadsheet. The responses were read and re-read numerous times, and comments were noted on the content of each student response for each question. The data and the comments were read and re-read again numerous times leading to an initial set of codes. These codes were further collapsed and

refined in several steps to arrive at the final set of codes. All parts of the coding process down to the final codes were documented and agreed upon by a faculty advisor to establish trustworthiness and rigor in the analysis.

### **Assumptions and Limitations**

The assumptions for this study were as follows. The individual completing the survey was a student in an accredited nurse anesthesia program. The individual was answering truthfully with adequate understanding of each survey item. Another assumption of this study, like in other survey research, is that the constructs under study can be effectively measured by questionnaires.

One of the limitations of this study was that the cross-sectional correlational design cannot be used to infer causality. This study design limited the ability to capture individuals without Internet access, but this risk was slight as most universities require students to have internet access. By only emailing associate members of the AANA, those students who were not members of the AANA were not included. Another limitation was the likelihood of a low response rate based on similar study from 2010 with a response rate of 25% (Chipas et al., 2012) and the trend reported by the AANA of 10% (AANA Electronic Survey Policy and Order Form Version 12-11-14, 2014). However, the needed sample size of 73 based on the power analysis was achievable.

### **Conclusion**

The student nurse anesthetist population experiences stress during their educational endeavors to become a CRNA. As nurse anesthesia programs transition to doctoral degrees in the coming years, students need to cope and manage stress for a

longer period of time. Greater information on stress, coping, and the role of social support for SRNAs academic success through this transition provided useful information with many potential benefits. One of the benefits could include improved student retention by anesthesia programs. It could also result in an increase in the likelihood of individual student success and promote their health and well being. With the development of positive coping during their training, these coping mechanisms can be carried over into their professional career for a healthier CRNA workforce

## CHAPTER IV

### RESULTS

A survey was developed in Qualtrics to measure perceived social support, stress, coping, and intent to persist in Student Registered Nurse Anesthetists (SRNAs). The survey was distributed via electronic mail by the American Association of Nurse Anesthetists (AANA) to a randomly selected 3,000 associate/student members. The survey was open for four weeks, and an electronic mail reminder was distributed seven days before the close of the survey. The Qualtrics survey was opened by 10% (307) of those invited to participate. Of those who opened the survey, a completed survey was submitted by 66% (204). This yielded an overall return rate of 6.8%.

Demographic data were also collected in the survey, and these results are shown in Table 1. This sample was 72% female and had a mean age of 30.83 (SD=4.8). Participants reported their marital status as follows: 32% single, 52% married, 5% divorced, and 11% cohabiting. No participants reported being widowed. Just over half (52%) of the participants relocated for school. All AANA regions covering the United States were represented in this sample as follows: 16% from Region 1, 15% from Region 2, 12% from Region 3, 14% from Region 4, 6% from Region 5, 16% from Region 6, and 21% from Region 7.

Table 1

## Participant Characteristics (N=204)

Characteristic	N (%) or Mean $\pm$ SD
Program Region	
Region 1	33 (16)
Region 2	30 (15)
Region 3	25 (12)
Region 4	29 (14)
Region 5	13 (6)
Region 6	32 (16)
Region 7	42 (21)
Length of Program (months)	29.93 $\pm$ 4.18
Class Size (n=203)	26.77 $\pm$ 18.32
Time in Program (years)	1.36 $\pm$ 0.78
Program Type	
Integrated	62 (30)
Front-loaded	142 (70)
Program Degree	
Masters	160 (78)
Doctoral	44 (22)
Gender	
Male	58 (28)



Female	146 (72)
Marital Status	
Single	66 (32)
Married	105 (52)
Divorced	10 (5)
Widowed	0 (0)
Cohabiting	23 (11)
Age	30.83 ± 4.80
Relocated for School	
Yes	106 (52)
No	98 (48)
BSN GPA* (n=202)	3.69 ± .23
Years of ICU* Experience	3.96 ± 2.89
Type of ICU* Experience	
Intensive Care Unit	92 (45)
Burn ICU*	5 (3)
Cardiac ICU*	42 (21)
Cardiothoracic ICU*	48 (24)
Cardiovascular ICU*	47 (23)
Coronary Care Unit	33 (16)
Medical ICU*	85 (42)
Neonatal ICU*	14 (7)

Neuro ICU*	44 (22)
Pediatric ICU*	22 (11)
Pulmonary ICU*	21 (10)
Surgical ICU*	83 (41)
Surgical Trauma ICU*	34 (17)
Trauma ICU*	28 (14)
Other ICU*	10 (5)

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\* BSN GPA – Bachelor’s of Science in Nursing Grade Point Average; ICU – Intensive Care Unit

The amount and type of intensive care unit (ICU) experience and Bachelor’s of Science in Nursing (BSN) Grade Point Average (GPA) were also collected and are shown in Table 1. This sample had a mean BSN GPA of 3.69 (SD=0.23). BSN GPA was only reported by 202 participants, with data missing from two participants. This sample also had a mean of 3.96 (SD=2.89) years of ICU experience, and had experience in more than 14 types of ICUs. Participants in this sample gained ICU experience in various types of units, and those results are shown in Table 1. Other types of ICUs listed by ten participants included: Post Anesthesia Care Unit (PACU) and Endoscopy; PACU; Emergency Department (ED) and ICU; ED; Pediatric High Infusion ICU; Cardiac Surgery ICU; Pediatric Cardiac ICU; ED and critical care transport; Pediatric Cardiac ICU and Extracorporeal Membrane Oxygenation (ECMO); and Flight Nursing.

In this sample and shown in Table 1., the mean program length was 29.93 (SD=4.18) months, and the mean class size was 26.77 (SD=18.32). Class size ranged

from 7-130. Class size was only reported by 203 participants, with no response from one participant. This sample had been enrolled in their program for a mean of 1.36 years (SD=0.78). Participants were enrolled in programs awarding both doctoral and master's degrees. Twenty-two percent were enrolled in a doctoral program, and the remaining participants were enrolled in a master's program. These results are shown in Table 1. Thirty percent of participants were enrolled in an integrated program, and seventy percent of participants were enrolled in a front loaded program.

Table 2

Descriptive Statistics (N=204)

Characteristic	Mean $\pm$ SD
Personal Resource Questionnaire (PRQ2000) Total Score	87.65 $\pm$ 12.22
Perceived Stress Score (PSS-4) Total Score	6.82 $\pm$ 3.03
Adaptive Brief COPE Score	36.75 $\pm$ 6.18
Maladaptive Brief COPE Score	32.17 $\pm$ 6.28
Intent to Persist Total Score	4.95 $\pm$ 3.18

Social support, stress, coping, and intent to persist were measured with the following tools, respectively: Personal Resource Questionnaire (PRQ2000) (Weinert, 2003), Perceived Stress Scale (PSS-4) (Cohen, Kamarck, & Mermelstein, 1983), Brief COPE (Carver, 1997), and three intent to persist items (Khalkhali, Sharifi, & Nikyar, 2013). The PRQ2000 was scored on a continuous scale with a score range from 15-105. Higher scores on the PRQ2000 indicated higher levels of perceived social support. This

sample had a mean PRQ2000 score of 87.65 (SD=12.22). In this sample, the Cronbach's alpha for the PRQ2000 was 0.903. The PSS-4 was also scored on a continuous scale with a score range from 0-16. Higher scores on the PSS-4 indicated higher stress. This sample has a mean PSS-4 score of 6.82 (SD=3.03). In this sample, the Cronbach's alpha was 0.814. The Brief COPE yielded a continuous adaptive coping score and a continuous maladaptive coping score, where higher scores for each indicate greater use of those coping behaviors. Scores for adaptive coping ranged from 4-64, and scores for maladaptive coping range from 4-48. The mean adaptive score was 36.75 (SD=6.18) and the mean maladaptive score was 32.17 (SD=6.28). The Cronbach's alphas for adaptive and maladaptive coping were 0.761 and 0.779, respectively. The three intent to persist items yielded a continuous score with a range from 3-21 with higher scores indicating a decreased intent to persist. The mean intent to persist score was 4.95 (SD=3.18). The Cronbach's alpha in this sample for the three intent to persist items together was 0.802

Assumptions were checked with residuals. The deleted residuals for adaptive coping and maladaptive coping were normal, and the deleted residuals for the intent to persist score were not normally distributed. In plotting the predicted value against the deleted residual for intent to persist score, the plot demonstrated concerns with heteroscedasticity. This concern with heteroscedasticity was addressed by transforming the intent to persist score variable with a base 10 logarithmic transformation (Polit, 2010). In checking for multicollinearity, Variance Inflation Factors (VIFs) were found to be 1.3, where values less than seven are adequate.

Correlations were computed among the seven variables, PRQ2000 total score, PSS-4 total score, program degree, program type, adaptive Brief COPE score, maladaptive Brief COPE score, and log intent to persist score, from sample (n=204). These results are displayed in Table 3. The results suggest that 9 out of 21 correlations were statistically significant, and are discussed here. The correlation between PRQ2000 total score and PSS-4 total scores was found to be statistically significant,  $r(203) = -.466$ ,  $p < .001$ . This indicates that as perceived social support (PRQ2000 total score) increased, then perceived stress (PSS-4 total score) decreased. This correlation coefficient value is negative and greater than 0.45 indicating a moderate bivariate linear association. If the correlation coefficient value was greater than 0.90, then it would indicate a strong relationship (Polit, 2010).

The correlation between doctorate vs. masters and frontloaded vs. integrated was found to be statistically significant,  $r(203) = .243$ ,  $p < .001$ . This correlation coefficient value is positive and not greater than 0.45. A positive phi coefficient means when one of the indicator variables is one then the other indicator variable is also likely one, where a negative phi coefficient means when one of the indicator variables is one the other indicator variable tends to be the opposite. Masters program degree and integrated program type were coded as zeros, and doctoral program degree and frontloaded program type were coded as ones. Crosstab results showed that there were 28.4% (58) integrated masters programs, 50% (102) front-loaded masters programs, 2% (4) doctoral integrated programs, and 19.6% (40) front-loaded doctoral programs.

The correlation between PSS-4 total score and adaptive Brief COPE score was found to be statistically significant,  $r(203) = .402, p < .001$ . This correlation coefficient value is positive, and it is not greater than 0.45. As perceived stress (PSS-4 total score) increased adaptive coping (adaptive Brief COPE score) also increased. The correlation between PSS-4 total score and maladaptive Brief COPE was found to be statistically significant,  $r(203) = .215, p < .01$ . This correlation coefficient value is positive, and is not greater than 0.45. As perceived stress (PSS-4 total score) increased maladaptive coping (maladaptive Brief COPE score) also increased. The correlation between adaptive Brief COPE score and maladaptive Brief COPE was found to be statistically significant,  $r(203) = .599, p < .001$ . This correlation coefficient value is positive, and is greater than 0.45 indicating a moderate relationship. As adaptive coping (adaptive Brief COPE score) increased maladaptive coping (maladaptive Brief COPE score) also increased.

The correlation between PRQ2000 total score and log intent to persist score was found to be statistically significant,  $r(203) = -.447, p < .001$ . As perceived social support (PRQ2000 total score) increased, log intent to persist scores decreased; where log increased, intent to persist score indicated participants were more likely not to continue their education. Therefore, increased PRQ2000 total score indicated that participants had a decreased propensity to discontinue their education. The correlation between PSS-4 total score and log intent to persist score was found to be statistically significant,  $r(203) = .448, p < .001$ . As perceived stress (PSS-4 total score) increased, log intent to persist scores increased; where increased log intent to persist score indicated participants were more likely not to continue their education. Therefore, increased PSS-4 total score

indicated that participants had a greater propensity to discontinue their education. The correlation between adaptive Brief COPE score and log intent to persist score was found to be statistically significant,  $r(203) = .311, p < .001$ . As adaptive coping (adaptive Brief COPE score) increased, log intent to persist scores increased; where increased intent to persist score indicated participants were more likely not to continue their education. Therefore, increased adaptive Brief COPE scores indicated that participants had a greater propensity to discontinue their education. This correlation coefficient value is positive, and not greater than 0.45. The correlation between maladaptive Brief COPE and log intent to persist score was found to be statistically significant,  $r(203) = .188, p < .01$ . As maladaptive coping (maladaptive Brief COPE total score) increased log intent to persist scores increased, where increased log intent to persist score indicated participants were more likely not to continue their education. Therefore, increased maladaptive Brief COPE score indicated that participants had a greater propensity to discontinue their education. This correlation coefficient value is positive, and not greater than 0.45.

Table 3

Correlations

Measure	1	2	3	4	5	6	7
1. PRQ2000 Total Score	(.90)						
2. PSS-4 Total Score	-.466***	(.81)					
3. Doctoral vs. Masters Degree	.098	-.111					
4. Frontloaded vs. Integrated Program	-.021	.071	.243***				
5. Adaptive Brief COPE Score	.003	.402***	-.058	0.43	(.76)		
6. Maladaptive Brief COPE Score	.080	.215 **	-.037	.073	.599***	(.78)	
7. Intent to Persist Total Score (log transformed)	-.447***	.488***	-.101	-.009	.311***	.188**	(.80)

*Note.* Coefficient alphas are presented in parentheses along the diagonal. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



A Multivariate Analysis of Covariance (MANCOVA) was done to analyze the effect of stress, social support, degree awarded, and type of degree program on adaptive coping, maladaptive coping, and intent to persist in SRNAs, and the results are shown in Table 4. A MANCOVA was conducted with adaptive Brief COPE score, maladaptive Brief COPE score, and Intent to Persist Score as dependent variables, and PSS-4 Score, PRQ2000 Score, degree awarded, and type of degree program as covariates. The results indicated a significant multivariate effect of PRQ2000 Score,  $F(3, 197) = 13.209, p < .001$ , and a significant multivariate effect of PSS-4 Score,  $F(3, 197) = 21.547, p < .001$ . The results indicated non-significant multivariate effect of degree type,  $F(3, 197) = .148, p = .931$ , and non-significant multivariate effect of program type,  $F(3, 197) = .464, p = .708$ . These results show that there are multivariate effects between the variables of stress, coping, adaptive coping, maladaptive coping, and intent to persist within this model. As a result of these significant relationships in the model, univariate analysis is necessary to examine these effects. The MANCOVA results suggested that individual modeling of each dependent variable (adaptive Brief COPE score, maladaptive Brief COPE score, and log intent to persist score) were warranted. These results are displayed in Tables 5-7, and discussed below.

Table 4

## MANCOVA Results (N=204)

Tool	F	Num df	Den df	P-value
PRQ2000 Total Score	13.209	3	197	<.001
PSS-4 Total Score	21.547	3	197	<.001
Type of Program	.464	3	197	.708
Type of Degree	.148	3	197	.931

\**Note.* df = degrees of freedom

Subsequent separate regression analyzes were completed for each of the independent variables showing significance in the MANCOVA results, PRQ2000 total score and PSS-4 total score, with the dependent variables, adaptive Brief COPE score, maladaptive Brief COPE score, and log intent to persist score. The multiple linear regression results for adaptive Brief COPE score are reported in Table 5, and the p-value for the PRQ2000 total score effect is 0.001. The coefficient for PRQ2000 total score is .123. For every additional increase in PRQ2000 total score, the predicted mean adaptive Brief COPE score increases by 0.123, adjusting for the other variables in the model including: PSS-4 total score, program degree, and program type. The p-value for the PSS-4 total score effect is <0.001. The coefficient for PSS-4 total score is 1.044. For every additional increase in PSS-4 total score, the predicted mean adaptive Brief COPE score increases by 1.044, adjusting for the other variables in the model including: PRQ2000 total score, program degree, and program type.

The multiple linear regression results for maladaptive Brief COPE score are report in Table 6, and the p-value for the PRQ2000 total score effect is 0.003. The coefficient for PRQ2000 total score is .119. For every additional increase in PRQ2000 total score, the predicted mean maladaptive Brief COPE score increases by 0.119, adjusting for the other variables in the model including: PSS-4 total score, program degree, and program type. The p-value for the PSS-4 total score effect is <0.001. The coefficient for PSS-4 total score is .650. For every additional increase in PSS-4 total score, the predicted mean maladaptive Brief COPE score increases by 0.650, adjusting for the other variables in the model including: PRQ2000 total score, program degree, and program type.

The multiple linear regression results for the log intent to persist score are report in Table 7, and the p-value for the PRQ2000 total score effect is <0.001. The coefficient for PRQ2000 total score is -.005. For every additional increase in PRQ2000 total score, the predicted mean log intent to persist score decreases by 0.005, adjusting for the other variables in the model including: PSS-4 total score, program degree, and program type. The p-value for the PSS-4 total score effect is <0.001. The coefficient for PSS-4 total score is .025. For every additional increase in PSS-4 total score, the predicted mean log intent to persist score increases by 0.025, adjusting for the other variables in the model including: PRQ2000 total score, program degree, and program type. In summary results for the first research question show, stress and social support affect coping and intent to persist, and program degree and program type do not affect coping and intent to persist. As stress increases coping increases, and as stress increases participants' desire to persist

in their education decreases as evidenced by an increase in log intent to persist scores. As social support increases coping increases, and as social support increases participants' desire to persist in their education increases as evidenced by a decrease in log intent to persist scores.

Table 5

Linear Multiple Regression Table for Adaptive Brief COPE Score

Variable	<i>b</i>	95% CI	$\beta$	<i>t</i>	<i>p</i>
PRQ2000 Total Score	.123	[.052, .195]	.244	3.421	.001
PSS-4 Total Score	1.044	[.755, 1.333]	.511	7.128	< .001
Program Type	.255	[-1.472, 1.983]	.019	.292	.771
Program Degree	-.450	[-2.391, 1.491]	-.030	-.457	.648

*Note.* Adjusted  $R^2 = .193$  (N=204,  $p < .001$ ). CI = confidence interval for *b*.

Table 6

Linear Multiple Regression Table for Maladaptive Brief COPE Score

Variable	<i>b</i>	95% CI	$\beta$	<i>t</i>	<i>p</i>
PRQ2000 Total Score	.119	[.041, .196]	.231	3.021	.003
PSS-4 Total Score	.650	[.335, .964]	.313	4.075	< .001
Program Type	.886	[-.994, 2.767]	.065	.930	.354
Program Degree	-.621	[-2.734, 1.492]	-.041	-.580	.563

*Note.* Adjusted  $R^2 = .074$  (N=204,  $p < .001$ ). CI = confidence interval for *b*.

Table 7

Linear Multiple Regression Table for log Intent to Persist Total Score

Variable	<i>b</i>	95% CI	$\beta$	<i>t</i>	<i>p</i>
PRQ2000 Total Score	-.005	[-.007, -.003]	-.279	-4.162	<.001
PSS-4 Total Score	.025	[.016, .034]	.358	5.313	<.001
Program Type	-.015	[-.070, .039]	-.034	-.552	.581
Program Degree	-.013	[-.074, .049]	-.025	-.407	.684

*Note.* Adjusted  $R^2 = .288$  (N=204,  $p < .001$ ). CI = confidence interval for *b*.

The four open-ended question responses were analyzed by qualitative content analysis, and the main themes are described here. The first question asked: How does the anesthesia students' social support system change during the program? There were 174 out of 204 participants who responded to this question. Almost twice as many participants (39) indicated that their support system had changed compared to those (21) who indicated that their support system had not changed. The causes of change in their support system included: participant being consumed with school; the participant had less time and, therefore the support system was less accessible; the participant had a new living arrangement associated with school; and participant had less support from old friends. Most responses indicated that the participants felt that their support system was unaware of the commitment of completing a nurse anesthesia program. Participants described the following changes in their support system: damaged or strained relationships, redistributions of responsibilities within their household, significant other

experiencing stress related to the participant being in anesthesia school, some participants reported feeling alone and isolated, and others utilized new ways of connecting with their support system (Skype, Face Time, and text). Participants indicated that significant others, family members, and friends were all sources of support. Many participants (43) indicated that their classmates had become a major source of support since beginning anesthesia school, because they could empathize and relate to each other's experiences and struggles. The participants (5) who indicated that their classmates were not a source of support cited the following reasons: the lack of diversity in their cohort (2) and a competitive nature within their cohort (3).

The second question asked: What support mechanisms do anesthesia programs offer students? There were 187 out of 204 participants who responded to this question. Approximately one fourth of the sample size (56) indicated their program did not offer any support mechanisms. Others indicated they received support from faculty. Participants perceived support from meetings with faculty, knowing their faculty was available, having a supportive nature, and an open door policy. Participants indicated the most common support mechanisms from anesthesia programs were free mental health counseling and the use of mentor programs. Mentor programs varied among schools in who was the mentor. Mentors included upper classmen, faculty, and Certified Registered Nurse Anesthetists (CRNAs). Participants perceived support from programs that offered a wellness program aimed at fostering wellness in the students.

The third question asked: What support mechanisms do students want from anesthesia programs? There were 155 out of 204 participants who responded to this

question. Approximately 38 out of 204 (18%) indicated that they did not need any support mechanism from their anesthesia program or for the anesthesia program to continue present offerings. Participants who made suggestion for support from anesthesia programs indicated that they wanted to be heard by supportive faculty, more time off from school, counseling services, a mentor program, and structured social activities.

The fourth question asked: How do the students prepare their social support systems prior to the beginning of anesthesia school? There were 170 out of 204 participants who responded to this question. Several participants (13) indicated that they did not prepare their social support system, and several other (6) participants indicated that support systems could not be prepared. Others prepared their social support system and indicated that they had talked to their social support system (96), talked to previous students (10), discussed role changes (6), looked for information on the Internet and in blogs (4) in order to be better prepared regarding the expectations of an anesthesia program, and others simply stated they had tried to plan and be prepared (25).

## CHAPTER V

### DISCUSSION

#### **Introduction**

This chapter provides an overview of the problem, an overview of the study, a brief summary of the findings, and focuses on the discussion of these findings in relation to each of the concepts in the literature. This chapter will also discuss the implications of the findings for education, practice, and research. Further research will be needed to continue to enhance the knowledge about these concepts and how they interact in nursing education, and to test the effectiveness of educational interventions to supportively help nurse anesthesia students cope with stress in order to be successful in the educational endeavors.

#### **Overview of the Problem**

Certified Registered Nurse Anesthetists (CRNAs) are a specialty-nursing group providing anesthesia for millions of Americans and are essential to the health care system. Seeking this career is stressful, and there are potential negative consequences from stress on students' health that can lead to mistakes and impact patients. Increasing the knowledge base regarding social support, stress and coping during nurse anesthesia student education would be efficacious for several reasons: to reduce stress in students, enhance learning, promote student success and decrease student attrition, facilitate



improvement in coping strategies to be carried into practice, and enhance patient safety and outcomes.

Student registered nurse anesthetists (SRNAs) are inundated with lectures, skill challenges, and being abruptly transitioned from a clinical expert in a previous environment to a novice in a new stressful environment. Therefore, stress is inevitable in the student registered nurse anesthetist (SRNA) population. The ability to adapt or cope with stress varies among individuals (Chipas & McKenna, 2011). Stress can be a positive motivator for students, but at higher levels can result in negative consequences (McKay, Buen, Bohan, & Maye, 2010; Wildgust, 1986). Many students reported negative coping mechanisms such as using alcohol or other drugs and criticizing self, while some simply give up on coping. Chipas et al. (2012) also reported that 47% of nurse anesthesia students reported depression and 21% reported suicidal ideations. These consequences of stress could ultimately result in failure of nurse anesthesia students to complete their education.

Several studies have demonstrated the presence of stress in SRNAs (Chipas et al., 2012, Perez & Carroll-Perez, 1999; Wildgust, 1986), and the stressful operating room environment in which they learn a stressful profession (Chipas & McKenna, 2011; Wright & Fallacaro, 2011). Several studies also reported the benefits of and needs for social support in order to manage stress and to cope as SRNAs (Chipas et al., 2012; Perez & Carroll-Perez, 1999; Wildgust, 1986). Eighty-nine percent of students utilize support systems for coping, and students depend on and trust other anesthesia students to help them cope by sharing their frustrations and concerns. (Perez & Carroll-Perez, 1999). In a

qualitative study, SRNAs utilized social support 2.5 times more than other means of coping (Conner, 2014).

With the documentation of stress in SRNAs, the recognized benefits of social support, the utilization of social support systems by some SRNAs, and the need for social support requested by other SRNAs, the relationship between stress, coping, and social support in nurse anesthesia students was examined. In designing this study, the literature was reviewed. No studies could be located that utilized random sample selection, and that studied the relationship of stress, social support, and coping in the SRNA population with validated and reliable measurement tools for stress, social support, and coping.

### **Summary of the Study**

The aims of this study were to examine the relationship between stress, social support, coping, program degree, program type, and intent to persist; and qualitatively explore the availability of, changes in, and needs for improvement in social support of SRNAs. A survey to measure perceived social support, stress, coping, and intent to persist in their education program was completed by 204 Student Registered Nurse Anesthetists (SRNAs). The survey was distributed via electronic mail by the American Association of Nurse Anesthetists (AANA) to a randomly selected 3,000 associate/student members. Survey results showed that as stress increased, the participants' desire to discontinue their education decreased; and as social support increased, stress decreased in participants. Results also showed that as stress increased, coping (both adaptive and maladaptive) also increased. Program type and program degree were not significant in any of the relationships or analyses with stress (PSS-4), social

support (PRQ2000), coping (adaptive Brief COPE and maladaptive Brief COPE), or intent to persist.

### **Sample Versus Population Comparison**

Population data of the entire population of associate members of the American Association of Nurse Anesthetists (AANA) differed slightly from this sample, however both show more females (58% population versus 72% sample) than males (B. Lowth, personal communication, August 26, 2015). This sample had a mean age of 30.83 (SD=4.8). Population data showed most associate members of the AANA were 20-29 years of age (49.76%), and 30-39 years of age (41.55%) (B. Lowth, personal communication, August 26, 2015). Of the participants surveyed, 22% were enrolled in a doctoral nurse anesthesia program. Of the 114 nurse anesthesia programs accredited by the Council on Accreditation (COA), 38% offer doctoral degrees (COA, 2015).

### **Stress**

Stress was measured with the Perceived Stress Scale – 4 item (PSS-4) (Cohen, Kamarck, & Mermelstein, 1983), and this sample showed a mean of 6.82 (SD=3.03) on a scale of 0-16 with a tool coefficient Alpha of 0.81. A cutoff for low, moderate, or high stress was not indicated in the literature. This SRNA sample returned a higher mean and a higher coefficient Alpha than the two previous studies reported (Cohen & Williams, 1988; Warttig et al., 2013). Cohen and Williamson (1988) reported a mean score of 4.49 with a standard deviation of 2.96 in a sample of 2,378 United States (U.S.) adults that responded to a phone interview, and reported tool coefficient Alpha of 0.66. Warttig et al. (2013) reported a mean score of 6.11 with a standard deviation of 3.14 in an English-

speaking sample of non-clinical adults in the United Kingdom (U.K.), and reported tool coefficient Alpha of 0.77. This shows that this sample of SRNAs was more stressed than the general adult population in U.S. and the U.K, and in subsequent uses of the PSS-4 mean stress levels were higher possibly indicating an upward trend. This higher level of stress has implications for student health and academic success. Increases in stress have been linked to negative coping behaviors (Tully, 2004), mental consequences (Edwards et al., 2010; O'Reilly et al., 2014; Wolf et al., 2015) and physical manifestations (Chipas et al., 2012; Tanaka et al., 2009). Stress reactions can negatively influence learning in several ways: “disturbed affect, change in adequacy of cognitive function, motor behavior impairment, physiological symptoms” (Kless, 1989, p. 79). Stress has been studied with regard to its sources and consequences and documented in the literature in nursing students (Goff, 2011; Hegge & Larson, 2008; Tully, 2004; Wolf et al., 2015), graduate students (El-Ghoroury et al., 2012; O'Reilly et al., 2014; Tanaka et al., 2009), and nurse anesthesia students (Chipas et al., 2012, Chipas & McKenna, 2011; Perez & Carroll-Perez, 1999; Phillips, 2010; Wildgust, 1986), but few studies seek to measure an overall level of stress (Chipas et al., 2012; Hegge & Larson, 2008; Kendrick, 2000). Hegge and Larson (2008) reported that the majority of accelerated BSN students rated their stress as extreme or extensive. Tully (2004) reported that diploma nursing students exceeded the cutoff score for distress of five with stress levels greater than 20. As both of these studies in undergraduate nursing students used different instruments to measure stress levels, it is difficult to compare these stress results to the results of the graduate SRNAs in this study. These two published studies and this study with SRNAs all indicate

that stress levels are above average in nursing students. Older studies in SRNAs have also well documented the sources and consequences of stress. The latest study conducted with SRNAs in 2010 (Chipas et al., 2012) reported and measured a level of stress utilizing only one item with responses on 10-point Likert scale, with no psychometric properties reported. Chipas et al. (2012) found the mean stress level in SRNAs was 7.2 on a scale of 1 to 10 with 5 indicating average stress. Stress needs to be further researched to provide comparisons across other medical and nursing students, graduate nursing students, and repeated in SRNAs all using the same scale. Collecting additional data with regard to the level of stress would be helpful for several reasons: 1: to establish a cutoff level for low, medium, and high stress levels with the PSS-4 scale, and 2: to determine which nursing students and SRNAs experience the most stress in order to develop interventions targeted at those students.

### **Social Support**

Social support was measured with the Personal Resource Questionnaire (PRQ2000) (Weinert, 2003), and reported mean of 87.65 (SD=12.22) with a score range of 15-105, and a coefficient Alpha of 0.90. When comparing the social support in the SRNA sample to other results in the literature, a sample of women between the ages 35-65 with chronic illness living in a rural location mean scores ranged from 78.91-86.07 with a coefficient Alpha range of 0.872-0.927 (Weinert, 2003). This tool has been used in Bachelor's of Science in Nursing (BSN) students with a mean of 89 (SD=14.09), and reported a coefficient Alpha of 0.938 (Smith, 2013). The SRNA sample reported lower perceived social support than BSN students with a mean of 87.65 for SRNAs. This may

be related to participants reporting changes in their support system since beginning anesthesia school. Participants indicated changes were due to the participant being consumed with school; participant having less time and, therefore less access to their support system; new living arrangements related to school; and less time for old friends. Some participants reported that within their support system some relationships were strained or damaged and that they felt alone and isolated. These effects of anesthesia school on the participants' social support system likely explain why SRNAs report less social support than BSN students. A change in support system was also reported by Kendrick (2000) that showed scores on a Personal Resources Questionnaire (four subscales include: recreation, social support, self-care, and rational/cognitive coping) showed a decrease in total mean Personal Resources Questionnaire results between the first year SRNA students and second year SRNA students, and the total mean Personal Resource Questionnaire results decreasing further in third year SRNA students. Kendrick (2000) demonstrated decreasing personal resources (including social support) as evidenced by a decreasing mean on the Personal Resources Questionnaire as SRNAs progressed in their program, just as was demonstrated with this SRNA sample, with the participants reporting changes in their social support system since beginning school.

Low social support has been linked to a wide range of negative mental health constructs including nonspecific psychological distress, PTSD, eating disorders, low self-esteem, and clinical depression (Lahey & Cronin, 2008). Hefner and Eisenberg (2009) reported the prevalence of psychological disorders in college students: mood disorders in 11%, anxiety in 12% (Blanco et al., 2008), suicidal ideation in 6% (American College

Health Association, 2008), past-year self-injury in 17% (Whitlock, Eckenrode, & Silverman, 2006), and eating disorders in 10% (Eisenberg, Nicklett, Roeder, & Kirz, 2009). Incidence of depression in SRNAs is 47% and suicidal ideation in SRNAs is 21% (Chipas et al., 2010) compared to the general college student population with an incidence of mood disorders of 11% and suicidal ideations of 6% (Hefner & Eisenberg, 2009). Results from this study with SRNAs showed that an increase in social support was associated with a decrease in stress. Further examination of social support in this population may bring to light why this particular group of graduate nurse anesthesia students has a quadrupled incidence of depression, and a tripled incidence of suicidal ideation, and/or possibly suggest a means or intervention to promote their psychological health and ultimately their educational success. Continued study may eventually prove stress level in students can be mediated by social support.

### **Coping**

Graduate school is the beginning of a period of major, unavoidable life changes, where graduate students in their first two years are placed in the life crisis category on the social readjustment rating scale (Goplerud, 1980, Perez & Carroll-Perez, 1990). Changes in or the addition of new roles can produce role strain with entrance and exit from roles and role sets. As with all college students when academic, social and psychological pressures are strong, and there are high expectations of success coupled with fear of failure, students experience stress (Osseiran-Waines & Elmacian, 1994). According to Osseiran-Waines and Elmacian (1994), social support is central to individual adjustment and “correlates negatively with psychological disorders..., positively with physical and

mental health, protects people in crisis . . . , and moderates effects of stressors on psychological well-being” (p.5). The strongest case is for the generalized value of emotional support in relation to stress situations (Leavy, 1983, Cohen & McKay, 1984), and the perceived available support as the strongest predictor of well being in nurses when compared to all other types of coping (Payne, 2001).

Coping in this study was measured with the Brief COPE (Carver, 1997).

Maladaptive or negative items of the Brief COPE (Carver, 1997) (17-28) in this sample of SRNAs were summed to give a mean of 32.17 (SD=6.18) with a scale range from 4-48, with higher scores indicating more maladaptive coping. Adaptive or positive items of the Brief COPE (1-16) in the sample of SRNAs were summed to give a mean of 36.75 (SD=6.18) with a scale range from 4-64 with higher scores indicating more positive coping. Meyer (2001) also used this two-factor model with coefficient Alphas of 0.81 for adaptive coping and 0.48 for maladaptive coping. The SRNA sample had coefficient alphas of 0.76 for adaptive coping and 0.78 for maladaptive coping. The literature has multiple ways to score this tool, and only one article could be located that scored it similarly to the method done with the SRNA sample in this study. However, it did not report means or standard deviation to allow comparison of results with this SRNA sample, nor does it provide normative values for comparison. Coping in the SRNA population has been researched with author-developed survey instruments (Chipas et al., 2012), by qualitative means (Phillips, 2010), and once with the Personal Resource Questionnaire (Kendrick, 2000). In the SRNA population, all the studies were published between 1986-2012. This is an area in need of future research done more consistently



with psychometrically tested tools to allow for comparison and to assist in evaluating the efficacy of interventions for student support. Interventions to support graduate students as they enter, move through, and exit graduate programs could prevent the occurrence of psychological problems in this population, and the development of interventions and preventive strategies is necessary.

### **Intent to Persist**

Three items to assess the SRNAs' intent to persist in their education program (Khalkhali, Sharifi, & Nikyar, 2013) were summed for a mean of 4.95 (SD = 3.18) with a score ranging from 3-21 with higher scores indicating a decreased intent to persist. This SRNA sample had a coefficient Alpha of 0.80. Khalkhali Sharifi, and Nikyar (2013) reported a coefficient Alpha of 0.78 with these three items in a sample of ninth grade Iranian boys, but no means or standard deviations were reported. This sample yielded a low mean, and 108 participants (<50%) indicated the lowest possible score of three indicating that they had the greatest intention of continuing their education. Forty-five participants had a total score of four or five, and this is still a low score showing their intention to continue their education. Twenty-one participants had values over 10, indicating a decreased intent to persist. Of those with scores greater than 10 (indicating less likelihood to persist), one third of those had stress scores greater 10, and the highest stress score was 14. Of these 21 with intent to persist scores greater than 10, the lowest PRQ2000 score was 29, which indicates low social support when compared to the sample mean of 87.65 (SD=12.22). Literature could not be found that provided comparative means and standard deviations for the intent to persist items. Research is needed to

establish comparative means and further explore this concept in relationship to other variables that may impact student success.

### **Major Findings and Discussion**

There are a few studies available on stress, social support, and coping, and none that address the intent to persist in nurse anesthesia students. Also, no studies could be located that look at stress, social support, and coping together in the nurse anesthesia student population. A study of these constructs and how they relate has beneficial implications for anesthesia programs to support students and improve academic success as programs transition to doctoral education. The results of this study looked at these concepts and found with the MANCOVA results that there were significant multivariate effects between the independent variables of stress and social support with the dependent variables of coping and intent to persist. As a result of these significant results, and in order to examine the univariate effects of each of the independent variables with the dependent variables required separate multiple linear regression analyzes. The results of these are as follows. As perceived social support increased, perceived stress decreased. This finding was supported by previous research. Goplerud (1980) found that the students who were supported compared to unsupported students reported less stress with social support emerging as a moderating variable that decreased the intensity of stressful events experienced, but did not decrease the number of events. Perceived social support was found to lessen the impact of stress (Asberg, Vogel, & Browers, 2008; Cohen & Willis, 1985; Goplerud, 1980).

In this sample of SRNAs, as perceived stress increased, adaptive and maladaptive coping increased. When individuals experience stress, it is logical that they would attempt to cope with the stress by any means, regardless of whether their coping strategies were adaptive or maladaptive. This is demonstrated in this sample, because as adaptive coping increased maladaptive coping also increased. In previous research, increases in stress have been linked to negative coping behaviors (Tully, 2004). An increase in avoidance coping leads to an increase in emotional exhaustion (Gibbons, 2010). Tully (2004) reported that students with high distress used less problem focused coping methods such as wishing things were different, eating, drinking, smoking, taking medications, taking it out on others, and trying to forget about it. The students with lower levels of distress used more problem focused coping such as talking to others, changing things to improve the situation, and trying to take one step at a time. Chipas et al. (2012) reported that the four most frequently used coping mechanisms in SRNAs were all maladaptive and included using alcohol or other drugs (most used), giving up trying to deal with stress, giving up on coping, expressing my negative feelings, and criticizing self. Maladaptive coping seems to be a prominent means of coping in this sample and in other SRNA research (Chipas et al., 2012; Phillips, 2010).

In this sample, the intentions of participants to continue their education increased as perceived social support increased. The intentions of participants to continue their education decreased with increased perceived stress, adaptive coping, and maladaptive coping. It is possible that increased coping behaviors (both adaptive and maladaptive) were related to the perceived stress the participants were experiencing, which negatively

impacted their desire to persist in their education. It is also possible that even with the use of adaptive and maladaptive coping behaviors, the participants were not able to effectively manage or lessen the stress they experienced related to their anesthesia education. This could indicate that the amounts of perceived stress in anesthesia school far exceed the abilities of the participants to manage it. Thus, they had a decreased intent to persist in their education.

To summarize, stress has a significant impact on coping, and SRNAs increase their coping in an attempt to manage the stress they are experiencing. SRNAs will increase the use of all means of coping (including both adaptive and a maladaptive) in order to deal with their stress. Since students increase both adaptive and maladaptive coping in response to increases in stress, anesthesia programs should build into the curriculum programs on stress management and coping. The goal of these programs would be that as stress increased, and then adaptive coping would increase more than maladaptive coping. Social support had beneficial effects on stress level and students' intentions to persist, and by decreasing student stress, students could experience improved well being and ultimately promote their continued success towards their educational goals. Increasing social support and decreasing stress could increase students' intent to persist in their education.

### **Qualitative Analysis Findings**

Many participants (43) in this sample indicated that their classmates had become a major source of support since beginning anesthesia school, because they could empathize and relate to each other's experiences and struggles. This finding was also found in

previous literature that showed anesthesia students depended on and trusted other anesthesia students to help them cope by sharing their frustrations and concerns (Conner, 2014; Phillips, 2010; Perez & Carroll-Perez, 1999). BSN nursing students also relied on fellow nursing students as a way to cope, and reported using members of their social support network to help them cope with stress (Hegge & Larson, 2008; Reeve et al., 2013).

Participants who made suggestions for support from anesthesia programs indicated that they wanted to be heard by supportive faculty, more time off from school, counseling services, a mentor program, and structured social activities. Participants desire more time off from school for a mental break. One participant indicated that they get two excused absences per school year, and that sometimes he or she needs a day to allow his or her brain to rest and nerves recuperate. The constant nature of anesthesia school does not leave time to recharge and refresh, and students are left feeling physically and emotional drained for the entire duration of their program. Some programs give little or no time off between semesters, and a two or three year program is a constant two or three year program. This can be very taxing on a student's well-being and mental health. In previous literature, SRNAs have also requested additional peer support and health and stress management tips (Phillips, 2010). Previous literature also indicates that in general practices to support students do not meet the needs of students (Perez & Carroll-Perez, 1999), and in this sample of SRNAs, three-fourths of participants requested or made suggestions for additional program support. Participants indicated that they desired more support from their programs in addition to what was currently offered, and in this sample

indicated the most common support mechanisms from anesthesia programs were free mental health counseling, and the use of mentor programs.

## **Theory**

Transitions Theory (Meleis, 2010) was used to guide this research study. This research study addressed several areas of this theory including; the community and societal level facilitators and inhibitors, which are things that can facilitate or inhibit an individual's progression in their transition. In this study, these were program type, program degree, and social support. How well an individual progresses through a transition was studied by measuring coping and intent to persist. In this study, the relationship was explored between the facilitators and inhibitors and the indicators of transition progression. In Meleis's Transition Theory, the patterns of response that indicated how an individual is progressing through the transition include the process and outcome indicators of the transition. Some examples of process indicators include feeling connected, interacting, location and being situated, developing confidence and coping. The outcome indicators were mastery and development of fluid integrative identities. Most of these were not measured in this study; only coping was measured. Therefore in this study, only coping and intent to persist were used as process indicators for how study participants were doing in their transition from registered nurse to certified registered nurse anesthetist (CRNA). This theory was useful in guiding this study, because it suggests that certain things in one's environment and one's personal resources impact one's transition experience and one's success in completing the transition. This theory recognizes that transitions can occur individually, or in multiples simultaneously, and that

there are different types of transitions (developmental, situational, health/illness, and organizational). This theory does not indicate a particular relationship direction between the concepts of this theory, but only suggests that community and society factors can facilitate or inhibit the transition process. This study supports that community and societal factors affect the transition process. This theory does not account for stress in transition, but with the nursing literature suggesting that nursing students' perceived stress is impacted by social resources (social support), and that coping mediates the student's perceived stress as they strive for a level of adaptation (Sawatzky, 1988), the placement of stress in Transition Theory should be considered. Literature has also shown that stress is prevalent in SRNAs and contributes to negative health outcomes. In this sample, increased stress was significantly related to coping (adaptive and maladaptive) as well as the participants' desire to persist in their education. To fully understand the transition process, which requires adaptation to a new position of mastery with integrative fluid identities, it is important to recognize that this change will be associated with some degree of stress on the person experiencing the transition. The addition of stress to Transition Theory should be further explored and researched.

### **Limitations and Biases**

There are several limitations to this study. The survey was open for four weeks, and an electronic mail reminder was distributed seven days before the close of the survey. The Qualtrics survey was opened by 10% (307) of those invited to participate. Of those who opened the survey, a completed survey was submitted by 66% (204). This yielded a overall return rate of 6.8% The typical response rate for this method of surveying a

random sample of associate members of the AANA is reported to be 10% (AANA Electronic Survey Policy and Order Form Version 12-11-2014, 2014), and is comparable to the 10% of those who opened this survey. The electronic mail from the AANA could have been delivered to a junk mail box of some of those who were randomly selected to receive an invitation for participation in this study. There are no data to compare the number of those who did and did not complete the survey of the 304 that opened it. Therefore, the potential of a nonresponse bias exists. There could be a difference in stress and coping in those who responded compared to those who did not respond to this survey invitation, and stress may be higher, coping may be less, family obligations may be greater, and social support may be less in those not responding.

Another limitation of this study was that the cross-sectional correlational design cannot be used to infer causality. Therefore, the results of this study indicate associations amongst the variables, but not a cause and effect relationship. This study design is also limited in its ability to capture individuals without Internet access, but this risk was slight as most universities require students to have internet access. Another limitation of this study is by only emailing associate members of the AANA, that those students who were not members of the AANA were not included.

### **Implications for Education**

Implications of this research for education are numerous. Approximately one fourth of the participants in this study indicated that their anesthesia program did not offer any support mechanisms. Social support was significantly related to perceived stress and to students' desire to persist in their education. Nurse anesthesia programs should



develop educational interventions to support students from the beginning of the program, and/or intervene earlier to support the student to improve academic success. Research is needed to study the influences of educational strategies on anesthesia student learning and stress, and to determine the knowledge base of anesthesia faculty on types of educational strategies. Anesthesia programs need to find ways to build support mechanisms and/or programs into their curriculum or school culture. Some currently utilized means of support offered by programs found in this study include free mental health counseling and the use of mentor programs. The suggestions from participants for support mechanisms from programs included more time off from school affording them a mental break and recovery period periodically throughout the program, and structured social activities to encourage interactions with fellow students in all currently enrolled cohorts. The provision of social support for students either directly from programs or indirectly by encouraging interactions among students could have a very positive affect on the students. Programs should also build into their curriculum stress management and coping education. Programs should take a proactive initiative to build adaptive coping behaviors in their students, and to discourage maladaptive coping behaviors.

Programs may also want to consider providing potential students with tools that they can use to prepare their support system outside of the program (significant other, family, and friends) for anesthesia school. Programs may want to consider having the students bring their significant other to the admission interview. The programs could offer an overview of the anesthesia program and the expectation of the student while in the program to all interviewing students and their significant other prior to starting

individual interviews in an effort to inform and prepare the student's support system for the changes ahead associated with beginning a nurse anesthesia educational program.

### **Implications for Practice**

There are several implications of this research for practice. Building supportive anesthesia practice groups could possibly decrease the stress CRNAs feel in their work place and SRNAs feel in their learning environment. Literature suggests that increased levels of stress are associated with negative affects on health (Perez & Carroll-Perez, 1999). Literature suggests individuals can have many different responses to stress, for example: fight or flight responses are a commonly known biological reaction to stress; psychosocial effects of stress can affect memory, attention (Cohen et al., 1973), and fatigue (Tanaka, Fukuda, Mizuno, Kuratsune, & Watanabe, 2009); can lead to emotions (Maslach, 1979) characterized by anxiety (Chipas et al. 2012), fears (Wildgust, 1986), and/or depression (O'Reilly, McNeill, Mavor, & Anderson, 2014); and can affect social behavior (Sherif & Sherif, 1953) characterized by isolation (Reeve et al., 2013) or in taking out stress on others (Tully, 2004). Many students reported negative coping mechanisms such as using alcohol or other drugs and criticizing self, while some simply give up on coping. Chipas et al. (2012) reported that 47% of nurse anesthesia students reported depression and 21% reported suicidal ideations, which is much higher than the general population of graduate students. Any or all of these effects of stress could impact the how well an anesthesia group functions together to meet the needs of their department, and could also negatively impact the environment in which SRNAs learn.

## **Implications for Research**

Future research should address the other areas of Transition Theory (Meleis, 2010) that are facilitators and inhibitors of the transition process. These include individual factors such as preparation and knowledge (years of intensive care unit (ICU) experience, type of ICU experience, previous BSN grade point average (GPA), moving to a new community for school, and socioeconomic status. Further research to establish the role/position of stress in Transition Theory is also needed.

Stress is common in and well documented in nursing students (Goff, 2011; Hegge & Larson, 2008; Tully, 2004; Wolf et al., 2015), graduate students (El-Ghoroury et al., 2012; O'Reilly et al., 2014; Tanaka et al., 2009), and nurse anesthesia students (Chipas et al., 2012, Chipas & McKenna, 2011; Perez & Carroll-Perez, 1999; Phillips, 2010; Wildgust, 1986), and research shows that nursing students experience above average (Chipas et al., 2012) distress (Tully, 2004) at various levels including extensive and extreme (Hegge & Larson, 2008). Few studies seek to measure an overall level of stress (Chipas et al., 2012; Hegge & Larson, 2008; Kendrick, 2000). Future research should collect the stress levels of other nursing student and other college student populations with the PSS-4, so that results of mean stress levels can be compared across nursing students and other medical professionals, and to establish norms of low, medium, and high levels of stress with this scale. With established stress norms in various nursing student populations, it will be easier to determine the effectiveness of interventions targeted at reducing stress in these students. More research needs to be done to explore

the methods of coping utilized by students and the impact of those methods on stress levels as well.

The incidence of depression and suicidal ideation reported in SRNA is 47% and 21%, respectively (Chipas et al, 2012). These rates of depression and suicidal ideations are greater than those reported for the general graduate student population of 11% and 6%, respectively (Hefner & Eisenberg, 2009). Research is needed to study the long term consequences of high levels of depression and suicidal ideations experienced by students during school. Research is also needed to determine the knowledge base of faculty for helping students cope, and dealing with students experiencing stress, depression, and suicidal ideations.

## **Conclusion**

The goal of nurse anesthesia educational programs is to produce a safe anesthesia provider who is equipped with the personal tools, abilities, motivation to manage the stress, other job related issues, and practice in his/her chosen profession providing high quality cost efficient care. As nurse anesthesia programs transition to doctoral degrees in the coming years, students will need to cope and manage stress for a longer period of time. Nurse anesthesia school will continue to be stressful due to the nature of the associated responsibilities and the large amount of information necessary to adequately manage a patient's anesthetics. Social support has been shown to be helpful for those facing adverse amounts of stress (Mechanic, 1978). This study and others several studies have suggested needs for more social support and stress management help for SRNAs (Conner, 2015; Chipas et al., 2012; Kless, 1989; Perez & Carroll-Perez, 1999; Phillips,

2010; Wildgust, 1986). All of these recommended that actions for education, practice, and research together have the potential to increase the academic success of students, and decrease attrition rates. They could also help produce a student who is better able to cope with stress during their education, and develops positive coping skills to carry forward into their anesthesia practice careers and ultimately improving the health of the CRNA workforce. Stress will always be a part of educating anesthesia students for both faculty and students, and it will always be a part of anesthesia practice, which is full of autonomy and great responsibility for the life of each patient. Investing in increasing available social support systems could help CRNAs and SRNAs manage/cope with the unavoidable stress in the practice and learning of anesthesia.

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## APPENDIX A

### IRB APPROVAL



THE UNIVERSITY of NORTH CAROLINA  
**GREENSBORO**

#### OFFICE OF RESEARCH INTEGRITY

2718 Beverly Cooper Moore and Irene Mitchell Moore  
Humanities and Research Administration Bldg.  
PO Box 26170  
Greensboro, NC 27402-6170  
336.256.0253  
Web site: [www.uncg.edu/orc](http://www.uncg.edu/orc)  
Federalwide Assurance (FWA) #216

**To:** Megan Conner School of Nursing

PO Box 83 Red Oak, NC 27868

**From:** UNCG IRB

**Date:** 4/27/2015

**RE:** Notice of IRB Exemption

**Exemption Category:** 2.Survey, interview, public observation

**Study #:** 15-0224

**Study Title:** Social Support, Stress, Coping, and Intent to Persist in Nurse Anesthesia Students

This submission has been reviewed by the IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

#### **Study Description:**

A randomized, online survey will be administered to student registered nurse anesthetists (SRNAs) to assess the relationship between social support, stress, coping, and intent to persist. Participants will be recruited through a service of the American Association of Nurse Anesthetists (AANA), which will deploy the survey link via email randomly to 3000 of 5900 associate members (SRNAs). The AANA does not permit the collection of participant personal identifiers or contact information by the PI, therefore no personal identifiers will be collected. The survey will be administered via a Qualtrics link, and then data will be collected and analyzed in SPSS.

### **Regulatory and other findings:**

- This research meets criteria for waiver of a signed consent form according to 45 CFR 46.117(c)(2).

### **Investigator's Responsibilities**

Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. Please utilize the most recent and approved version of your consent form/information sheet when enrolling participants. The IRB will maintain records for this study for three years from the date of the original determination of exempt status.

Signed letters, along with stamped copies of consent forms and other recruitment materials will be scanned to you in a separate email. **Stamped consent forms must be used unless the IRB has given you approval to waive this requirement.** Please notify the ORI office immediately if you have an issue with the stamped consents forms.

Please be aware that valid human subjects training and signed statements of confidentiality for all members of research team need to be kept on file with the lead investigator. Please note that you will also need to remain in compliance at [http://policy.uncg.edu/research\\_data/](http://policy.uncg.edu/research_data/).

CC:

Lynne Lewallen, Parent-Child Nursing





THE UNIVERSITY of NORTH CAROLINA  
**GREENSBORO**

**OFFICE OF RESEARCH INTEGRITY**

2718 Beverly Cooper Moore and Irene Mitchell  
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Federalwide Assurance  
(FWA) #216

**To:** Megan Conner School of Nursing

PO Box 83 Red Oak, NC 27868

**From:** UNCG IRB

**Date:** 6/23/2015

**RE:** Notice of IRB Exemption (modification)

**Exemption Category:** 2.Survey, interview, public observation

**Study #:** 15-0224

**Sponsors:** AANA Foundation

**Study Title:** Social Support, Stress, Coping, and Intent to Persist in Nurse Anesthesia Students

This submission has been reviewed by the IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

**Study Description:**

A randomized, online survey will be administered to student registered nurse anesthetists (SRNAs) to assess the relationship between social support, stress, coping, and intent to persist. Participants will be recruited through a service of the American Association of Nurse Anesthetists (AANA), which will deploy the survey link via email randomly to 3000 of 5900 associate members (SRNAs). The AANA does not permit the collection of participant personal identifiers or contact information by the PI, therefore no personal identifiers will be collected. The survey will be administered via a Qualtrics link, and then data will be collected and analyzed in SPSS.

**Regulatory and other findings:**

This research meets criteria for waiver of a signed consent form according to 45 CFR 46.117(c)(2).

### **Modification Information:**

Changes to the IRB Information sheet, and changes to a survey question as a stipulation for grant funding and for distribution by the AANA survey deployment service. The revised IRB information sheet has been added as well as a revised survey question document. The AANA Foundation and the AANA survey deployment service requested a stronger impact statement in order for them to award me grant money and to deploy my survey to its members.

### **Investigator's Responsibilities**

Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. Please utilize the most recent and approved version of your consent form/information sheet when enrolling participants. The IRB will maintain records for this study for three years from Signed letters, along with stamped copies of consent forms and other recruitment materials will be scanned to you in a separate email. **Stamped consent forms must be used unless the IRB has given you approval to waive this requirement.** Please notify the ORI office immediately if you have an issue with the stamped consents forms.

Please be aware that valid human subjects training and signed statements of confidentiality for all members of research team need to be kept on file with the lead investigator. Please note that you will also need to remain in compliance with the university "Access To and Retention of Research Data" Policy which can be found at [http://policy.uncg.edu/research\\_data/](http://policy.uncg.edu/research_data/).

CC:

Lynne Lewallen, Parent-Child Nursing

## APPENDIX B

### SURVEY INSTRUMENT

# Survey of Student Registered Nurse Anesthetists

## Introduction

### IRB Information Sheet

**Project Title: Social Support, Stress, Coping, and Intent to Persist in Nurse Anesthesia Students**

**Principal Investigator: Megan Conner, MSN, CRNA  
Faculty Advisor: Lynne Lewallen, PhD, RN, CNE, ANE**

#### What is this all about?

I am asking you to participate in this research study to learn more about your perceptions of social support, stress, coping, and your intent to persist in your education. Increasing the knowledge base regarding social support, stress and coping during nurse anesthesia student education would be efficacious for several reasons: to reduce stress in students, enhance learning, promote student success and decrease student attrition, facilitate improvement in coping strategies to be carried into practice, and enhance patient safety and outcomes. This research project will only take less than 20 minutes and will involve you completing an online survey. Your participation in this research project is voluntary.

#### How will this negatively affect me?

Other than the time you spend on this project, there are very minimal risks involved with this study. Occasionally, thinking about stressful situations can cause people to be upset. If you are upset while taking this survey, you can contact the National Alliance on Mental Illness at 1-800-950-NAMI (6264) or info@nami.org. The NAMI HelpLine can be reached Monday through Friday, 10 am–6 pm, ET. If you are in crisis or just need to talk about suicidal thoughts, call 911 or 1-800-273-TALK (8255), the National Suicide Prevention Lifeline. It is a 24-hour, toll-free, confidential suicide prevention hotline.

#### What do I get out of this research project?

You and/or society will or might benefit if we can learn how to help increasing the available anesthesia providers.

#### Will I get paid for participating?

There is no compensation for participating in this study.

#### What about my confidentiality?

We will do everything possible to make sure that your information is kept confidential. *Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have*

been doing. We will not ask for any identifying information. Data will be collected with an on-line Qualtrics survey. Access to the data collected in Qualtrics will require a password. Data will be moved to a statistical program for analysis and will be stored in a password protected file on a password protect universal storage device.

What if I do not want to be in this research study?

You do not have to be part of this project. This project is voluntary and it is up to you to decide to participate in this research project. If you agree to participate at any time in this project you may stop participating without penalty.

What if I have questions?

You can ask Megan Conner (at 919-250-9740 or [mmmyrick@uncg.edu](mailto:mmmyrick@uncg.edu)) or Dr. Lynne Lewallen (at 336-334-5170 or [lynne\\_lewallen@uncg.edu](mailto:lynne_lewallen@uncg.edu)) anything about the study. If you have concerns about how you have been treated in this study call the Office of Research Integrity Director at 1-855-251-2351.

Approved IRB  
6/23/15

I have read and understood the above information and desire of my own free will to participate in this study.

<input type="radio"/> Yes	<input type="radio"/> No
---------------------------	--------------------------

**Instructions:**

Please answer each question by selecting only one response for each question unless otherwise noted in the question.

Please reflect on your experiences since beginning and during your nurse anesthesia educational program.

**PRQ**

Below are some statements with which some people agree and others disagree. Please read each statement and ***indicate*** the response most appropriate for you. There is no ***right*** or ***wrong*** answer. Please reflect on your experiences **since beginning and during your nurse anesthesia educational program.**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
There is someone I feel close to who makes me feel secure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I belong to a group in which I feel important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People let me know that I do well at my work (school, job, homemaking).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have enough contact with the person who makes me feel special.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some statements with which some people agree and others disagree. Please read each statement and *indicate* the response most appropriate for you. There is no *right* or *wrong* answer. Please reflect on your experiences since beginning and during your nurse anesthesia educational program.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I spend time with others who have the same interest that I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others let me know that they enjoy working with me (job, committees, projects).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are people who are available if I need help over an extended period of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Among my group of friends we do favors for each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some statements with which some people agree and others disagree. Please read each statement and *indicate* the response most appropriate for you. There is no *right* or *wrong* answer. Please reflect on your experiences since beginning and during your nurse anesthesia educational program.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I have the opportunity to encourage others to develop their interests and skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have relatives or friends who will help me out even if I can't pay them back.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am upset, there is someone I can be with who lets me be myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know that others appreciate me as a person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some statements with which some people agree and others disagree. Please read each statement and *indicate* the response most appropriate for you. There is no *right* or *wrong* answer. Please reflect on your experiences since beginning and during your nurse anesthesia educational program.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
There is someone who loves and cares about me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have people to share social events and fun activities with.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a sense of being needed by another person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**PSS**

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate how often you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Brief COPE**

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been turning to work or other activities to take my mind off things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been concentrating my efforts on doing something about the situation I'm in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been saying to myself "this isn't real".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been using alcohol or other drugs to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been getting emotional support from others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been giving up trying to make the situation better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been taking action to try to make the situation better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been refusing to believe that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been saying things to let my unpleasant feelings escape.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been getting help and advice from other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been using alcohol or other drugs to help me get through it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been trying to see it in a different light, to make it seem more positive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been criticizing myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been trying to come up with a strategy about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been getting comfort and understanding from someone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been giving up the attempt to cope.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been looking for something good in what is happening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been making jokes about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been accepting the reality of the fact that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been expressing my negative feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been trying to find comfort in my religion or spiritual beliefs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been trying to get advice or help from other people about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been learning to live with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These items deal with ways you've been coping with the stress in your life since beginning and during your nurse anesthesia educational program. These items ask what you've been doing to cope. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

	I haven't been doing this at all.	I've been doing this a little bit.	I've been doing this a medium amount.	I've been doing this a lot.
I've been thinking hard about what steps to take.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been blaming myself for things that happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been praying or meditating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been making fun of the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please reflect on your experiences since beginning and during your nurse anesthesia educational program to answer the following questions.

	Not at all in agreement.	Rarely in agreement	Slightly in agreement	Somewhat in agreement	In agreement	Mostly in agreement.	Completely in agreement.
I sometimes consider dropping out of school. (Vallerand et al., 1997)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to drop out of school. (Vallerand et al., 1997)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes feel unsure about continuing my studies year after year. (Hardre and Reeve, 2003)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Program Characteristics**

**In what year did you start your nurse anesthesia program?**

<input type="radio"/> 2015
<input type="radio"/> 2014
<input type="radio"/> 2013
<input type="radio"/> 2012

**In what month did you start your nurse anesthesia program?**

<input type="radio"/> January	<input type="radio"/> February	<input type="radio"/> March
<input type="radio"/> April	<input type="radio"/> May	<input type="radio"/> June
<input type="radio"/> July	<input type="radio"/> August	<input type="radio"/> September
<input type="radio"/> October	<input type="radio"/> November	<input type="radio"/> December



**What type of degree does your anesthesia program award?**

<input type="radio"/> Master's	<input type="radio"/> Doctoral
--------------------------------	--------------------------------

**What type of program is your anesthesia program?**

- **Integrated programs** have a few weeks of intensive classroom experience, but students begin their clinical experience early in the first semester of their anesthesia program coursework.
- **Front loaded programs** require the students to complete some course work prior to clinical experience, and length of time for course work upfront can vary and range from one semester to a full year.

<input type="radio"/> Integrated	<input type="radio"/> Front-loaded
----------------------------------	------------------------------------

**How long is your anesthesia program?**

_____ months
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**How many students are in your class including yourself?**

_____ number of students
--------------------------

**What region is your anesthesia program located?**

<input type="radio"/> Region 1 - Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, Vermont
<input type="radio"/> Region 2 - Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, West Virginia
<input type="radio"/> Region 3 - Illinois, Indiana, Michigan, Wisconsin
<input type="radio"/> Region 4 - Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota
<input type="radio"/> Region 5 - Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming
<input type="radio"/> Region 6 - Delaware, District of Columbia, Maryland, Ohio, Pennsylvania
<input type="radio"/> Region 7 - Alabama, Florida, Louisiana, Mississippi, Texas

**Personal Characteristics**

**What is your gender?**

<input type="radio"/> Male	<input type="radio"/> Female
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**What is your marital status?**

<input type="radio"/> Single	<input type="radio"/> Married	<input type="radio"/> Divorced	<input type="radio"/> Widowed	<input type="radio"/> Cohabiting
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**What is your age?**

_____ Years
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**Did you relocate for school?**

- Relocation is defined as a significant residence move by an individual in which the individual perceives that it is a move that is “far enough that [they] can no longer see [their] old friends easily every day” (Weiner & Hannum, 2012, p. 665)

<input type="radio"/> Yes	<input type="radio"/> No
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**What was your Bachelor’s of Science Degree (BSN) Grade Point Average (GPA)?**

_____ GPA
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**How much time did you work in the intensive care unit (ICU) as a RN?**

_____ Years	_____ Months
-------------	--------------

**What type of intensive care unit (ICU) experience did you have as a RN? Select all that apply.**

<input type="radio"/> Intensive Care Unit
<input type="radio"/> Burn Intensive Care Unit
<input type="radio"/> Cardiac Intensive Care Unit
<input type="radio"/> Cardiovascular Intensive Care Unit
<input type="radio"/> Coronary Care Unit
<input type="radio"/> Medical Intensive Care Unit
<input type="radio"/> Neonatal Intensive Care Unit
<input type="radio"/> Neuro Intensive Care Unit
<input type="radio"/> Pediatric Intensive Care Unit
<input type="radio"/> Pulmonary Intensive Care Unit
<input type="radio"/> Surgical Intensive Care Unit
<input type="radio"/> Surgical Trauma Intensive Care Unit
<input type="radio"/> Trauma Intensive Care Unit
<input type="radio"/> Other Intensive Care Unit

**If other ICU, please specify.**

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**Children**

**Do you have any children?**

<input type="radio"/> Yes	<input type="radio"/> No
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**If yes, how many children do you have?**

_____ number of children
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**What is/are the age(s) of your children?**

Child	Age
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

**Do you have more than 10 children?**

<input type="radio"/> Yes	<input type="radio"/> No
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**What are the ages of your other children?**

Child	Age
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

**Do any of your children live with you?**

<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Sometimes
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**What percent of the time does/do they live with you?**

Child	Percent of Time Living with You
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

**What percent of the time do they live with you?**

Child	Percent of Time Living with You
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

**Open Ended Questions**

**How has your social support system change during your anesthesia program?**

**What support mechanisms does your anesthesia programs offer to students?**

**What support mechanisms would you like from your anesthesia program?**

**How did you prepare your social support systems prior to the beginning of anesthesia school?**

APPENDIX C

PRQ2000 PERMISSION

November 13, 2015

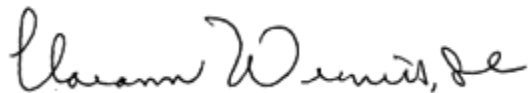
Megan Conner  
PO Box 83  
Red Oak, SC 27868

Ms. Conner:

Please let this letter serve as your permission to use the PRQ85 or PRQ2000. Any changes to question stems or answer sets must be approved in advance. Translation of the PRQ into other languages is acceptable and encouraged. A copy of the translated version of the PRQ should be sent to me. If you do, in fact, use the PRQ for data collection in your study, I ask that you send me an abstract of your findings. Should you have any questions or need clarification, kindly write or e-mail [cweinert@montana.edu](mailto:cweinert@montana.edu). I will try to respond in a timely manner.

Thank you for your interest in the PRQ. I hope that this social support measure will be helpful in your research.

Sincerely,



Clarann Weinert, SC, PhD, RN, FAAN  
Professor Emerita  
[www.montana.edu/cweinert](http://www.montana.edu/cweinert)