Self-Efficacy, Stress, and Social Support in Retention of Student Registered Nurse Anesthetists

Megan Conner, CRNA, MSN

Many studies document the presence of stress and the need for social support in anesthesia students. By addressing these, one can increase students’ self-efficacy, which is related to beliefs in one’s ability to accomplish an objective. By measuring and instituting measures to increase self-efficacy, we could improve student selection in nurse anesthesia programs, and increase academic success and likelihood of retention. This article reviews the literature on this topic and makes recommendations for increasing student self-efficacy.

Keywords: Retention, self-efficacy, social support, stress, student registered nurse anesthetists.

Educators and program administrators have long considered how to select the best applicants for admission to their program by identifying admission criteria that are most associated with student academic and clinical success. Applicants to nurse anesthesia educational programs (NAEPs) compete for a finite number of openings, and admission criteria can vary from program to program. The basic admission criteria used by most programs across the United States include grade point average (GPA), science GPA, Graduate Record Examination (GRE) scores, and critical care nursing experience. Additional requirements may include letters of recommendation and applicant interviews. The Council on Accreditation of Nurse Anesthesia Educational Programs (COA) requires the enrollment of baccalaureate-prepared registered nurses with at least 1 year of acute or critical care experience. Not only is student selection important, but so are the retention and successful progression of competent students in NAEPs.

Attrition rates in anesthesia programs are of interest to educators and to the profession as an important educational process outcome. When there is student attrition, there is a loss in terms of time and financial resources to the student, to the NAEP, and to the anesthesia and nursing professions. If a student does not complete the program, his or her position cannot be filled. This is a loss to another student who may have been capable of successful program completion. Program loss results in decreased tuition dollars and loss to the withdrawing student in terms of nonrefundable school-related investments and tuition costs. A report from 2014 of only tuition and university fees for US anesthesia programs (both master’s and doctoral programs) showed a median of $50,077 with a range of $15,000 to $118,056, and these figures do not include living expenses, net income forgone, and loan costs. Generally students are required to end their employment arrangements for full-time study, and the critical care nursing unit loses a trained specialty nurse. Nursing turnover costs have been reported to cost $64,000 for turnover of a specialty nurse. Attrition is a waste of time, money, and effort by all parties.

The nurse anesthesia profession is affected by not only student attrition but also stress. Stress in nurse anesthesia education is inevitable and can be a positive motivator for students, but at higher levels it can result in negative consequences. Chipas et al reported that 47% of anesthesia students reported depression and 21% reported suicidal ideations. If stress exceeds a manageable level, negative consequences can arise, affect the health of the student registered nurse anesthetist (SRNA), and possibly impair patient safety.

Self-efficacy is related to one’s beliefs in one’s ability to accomplish an objective. High levels of self-efficacy have been shown to be predictive of increased academic performance and improved student retention. Self-efficacy can be increased in numerous ways, including task mastery as with high-fidelity simulation; social persuasion/support; vicarious experiences; and emotional or somatic states (Table 1). Social support, which increases self-efficacy, has been shown to be helpful for those facing stressful situations. Several studies suggest the need for more social support and stress management for SRNAs. Increasing social support and other methods of increasing self-efficacy could be helpful for the SRNA by promoting academic success, retention, and...
coping with adverse levels of stress. This work reviews the current literature related to retention, stress, and self-efficacy and their relationship to nurse anesthesia education, and offers suggestions for NAEPs and future research.

**History and Review of Literature**

- **Retention in Nurse Anesthesia Educational Programs.** Attrition means the loss of students who fail to reenroll in successive semesters.\(^6\) Retention is an educational institution's ability to retain a student from admission through graduation.\(^3\) Retention is related to a student's persistence, which is defined as the desire and action of the student to remain in an educational system until degree completion.\(^6\) The literature uses the terms attrition and retention/persistence interchangeably. The ultimate goal is for SRNAs to complete the program and pass the certifying examination to become safe, competent anesthesia providers.

  An important educational process outcome,\(^3\) attrition rates of NAEPs were reported in 1993, with an annual average student attrition rate of 8.2% between 1986 and 1990.\(^4\) This attrition was attributed to personal reasons (46%), clinical reasons (17%), academic reasons (21%), and a combination of reasons (16%).\(^4\) A 2005 study reported a comparable attrition rate to that reported in 1993, indicating little change in the rate of attrition between the 2 studies.\(^3\) However, it was found in the 2005 study that higher attrition rates occurred in programs of longer duration.\(^3\) There are conflicting reports as to the main reason for attrition. Personal reasons, academic and clinical reasons, and improper socialization have all been reported by various studies as reasons for attrition.\(^4,17,18\)

- **Stress in Anesthesia Programs.** Stress is an adaptive response to change from the norm.\(^8,9,14\) High stress levels result in negative effects on the health and well-being of students, and stress that exceeds an individual's ability to adapt can lead to physical or emotional disease.\(^14\) Consequences of stress among students acquiring nursing education include sleep difficulties and high anxiety, and may result in failure to complete their education.\(^14\)

  For anesthesia students, the knowledge, skills, and administration of anesthesia occur in a stressful environment.\(^19\) Students are also inundated with lectures, skill challenges, and being abruptly converted from being a clinical expert in the previous work environment to a novice in a new environment\(^9\) as they seek to become competent Certified Registered Nurse Anesthetists (CRNAs). CRNAs work under minimal supervision by anesthesiologists or other physicians; they make decisions that are vital and profoundly influence patient outcomes.\(^14\) The work of a CRNA usually requires critical decisions, use of complex technological equipment, and extensive responsibilities in a complex system.\(^14\) These factors influencing the work of CRNAs yield an anxiety-producing learning environment for students, and a stressful work environment for CRNAs.

  Nurse anesthesia is a stressful career, and learning to be a competent CRNA requires a difficult and stressful path. One study of 1,374 SRNAs reported that on an average day, the mean stress level was 7.2 on a scale of 1 to 10.\(^9\) Wildgust\(^8\) found that information overload was rated the highest academic stressor. Students also identified fear of academic failure as a major stressor, as well as role ambiguity as a major clinical stressor.\(^8\) Many students had sought professional help for stress, and 17% of students took prescription medications to relieve symptoms of stress.\(^9\) Negative consequences reported by Chipas et al\(^9\) included, but were not limited to, anxiety, agitation, decreased concentration, headaches, nervousness, sleep disturbances, overuse of alcohol, eating disorders, and digestion disorders.

  With the decision to pursue a graduate degree in nurse anesthesia, there are many life changes and decisions that result. Most NAEPs require full-time study without concurrent employment, which means students must secure financial means to cover loss of income and tuition expense they will incur. Some students will have to move their residence if their school is not near their current location. The time-consuming nature of anesthesia school limits the students' time with their current social support system, possibly increasing stress and forcing them into new coping methods. According to the Social Readjustment Rating Scale, all SRNAs are in at least a state of moderate life crisis because of changes in financial status, a new line of work, beginning school, and change in social activities.\(^14\) Perez and Carroll-Perez\(^14\) reported that 26% of students were in a moderate life crisis and 73% were in a major life crisis.

- **Self-Efficacy.** Self-efficacy is a part of social cognitive theory.\(^10\) Bandura\(^10\) suggests that a person's self-efficacy is related to beliefs in his or her abilities to accomplish certain objectives. It is also suggested that self-efficacy would affect behavior such that high levels of self-efficacy yielded an approach behavior and low levels led to avoidance. Individuals will use avoidance when they believe an activity is beyond their capability but will use approach behavior when they believe they are capable of performing the activity.\(^20\) A person's beliefs that affect his or her perceived self-efficacy are related to his or her beliefs about a specific task or objective, and self-efficacy is context dependent.\(^10\)

  There are 4 primary influences of self-efficacy, according to Bandura\(^10\) and these include mastery of the task, social persuasion, vicarious experiences, and emotional or somatic states (Table 1). These 4 effectors of self-efficacy can have either positive or negative effects on self-efficacy.\(^10\) Task mastery is related to an individual's previous success with a particular task, and successful task completion increases self-efficacy whereas failure
decreases self-efficacy. Social persuasion in the form of encouragement from others increases self-efficacy. A vicarious experience of social modeling leads to an increase in self-efficacy when a person sees another similar person accomplish the objective. An experience is vicarious if it is "experienced or felt by watching, hearing about, or reading about someone else rather than by doing something yourself." A person’s physiologic stress reactions affect self-efficacy. Negative stress reactions may be associated with poor performance and decreasing self-efficacy. A positive emotional state would enhance an individual’s beliefs related to an objective, and increasing self-efficacy. It is not the degree of these emotional or somatic states that affect self-efficacy, but how an individual interprets these states.

A student’s ability or willingness to take on challenging tasks, give a greater effort in the task accomplishment, have greater persistence in the presence of barriers, better regulate the learning process, and use more cognitive strategies to facilitate his or her learning is a result of greater self-efficacy. Several studies have supported that an accurate measure of self-efficacy could be predictive of nursing student performance and have an impact on future nursing education. Harvey and McMurray found that students with low self-efficacy were less likely to complete their academic program compared with those with higher self-efficacy. Black et al. found that higher self-efficacy led to academic success, because students were able to identify and implement behaviors needed for goal attainment. Clayton et al. reported that individuals who believe they have the ability necessary to overcome challenges were more likely to strive to reach their goals. Greater willingness to apply effort in learning came from those who believe they are competent.

There are 4 characteristics common in individuals with high self-efficacy. These include confidence, capability, persistence, and strength. Confidence involves an individual having a stable, set belief that he or she is capable of completing a task, and capability is related to his or her ability to carry out the task. Persistence is the ability to succeed over time, and strength is related to the ability to perform in stressful conditions. It is suggested that without the presence of each of these attributes, a student’s self-efficacy would be low and ultimate success would be unlikely. Because self-efficacy is a personal belief, it is indicated that the best method of measuring it is via self-report.

Taylor and Reyes report on their study of self-efficacy and resilience in baccalaureate nursing students. They found that self-efficacy scores were higher at semester end, and this is consistent with literature that self-efficacy goes up as individuals overcome challenges and reach their accomplishments. Progression through an education program will promote the building of self-efficacy. Students who do not successfully overcome challenges or do not succeed at things for which they are not adequately prepared will experience a decrease in self-efficacy. This may be related to increased stress in integrated nurse anesthesia programs in which coursework and clinical learning occur simultaneously, and may affect self-efficacy of these students.

Several studies have suggested how to increase self-efficacy in baccalaureate nursing students. Kuiper et al.

found that clinical journaling increased self-efficacy. Several studies concluded the use of simulation led to increases in self-efficacy. Sinclair and Ferguson reported that integration of simulation activities into the classroom increased perceived self-efficacy for nursing practice in nursing students. Other studies with baccalaureate nursing students suggested creating personalized classrooms, and use of role-play increased self-efficacy. Students required greater emotional and academic support in meeting learning needs before the development of clinical competence, when they had low levels of self-efficacy.

Several studies in nonnursing students have suggested how to increase self-efficacy. Linnenbrink and Pintrick concluded that the provision of adequate feedback helped students to develop reasonable self-efficacy beliefs. Feedback should be task specific and inform students about their skills. Other studies involving nonnursing students suggested that student engagement through empowerment and use of problem-based learning increased self-efficacy.

• Coping and Social Support. Student registered nurse aesthetists have used a variety of coping methods, including going out with family and friends, seeing things in a positive light, seeking emotional support, obtaining comfort from religion and spiritual beliefs, and getting help from healthcare professionals. Many students in the same study reported negative coping mechanisms, including using alcohol or other drugs, criticizing oneself, and giving up on coping and on dealing with issues altogether. The same study reported the following suggestions from SRNAs to increase their well-being. Students wanted peer support, exercise programs or affordable gym access, and access to personal health and stress management tips, and wanted to require schools to integrate wellness into the curriculum in a routine way.

An important coping mechanism for everyone is a support system. Social support may yield a wide range of functions, including nurturing, empathy, encouragement, information, material assistance, and expression of sharedness. Presence and use of social support can be protective for those experiencing adverse levels of stress. In 1999, most SRNAs (77%) reported that their school did not have a stress management program. Of the 22% of students who reported having a stress management program, only 8% reported using it. Student
coping mechanisms at that time included ventilating frustrations to fellow classmates, relying on personal support systems, exercising, using relaxation techniques to deal with stressful situations, communicating feelings to faculty, and seeking guidance from a professional counselor.  

Discussion
A recent evidence-based review of the literature found no consensus on admission criteria that was useful in predicting student success in NAEPs. Research has shown there are multiple admission criteria that predict student success in NAEP, including undergraduate GPA, science GPA, and nursing GPA. The utility of GRE scores in predicting success in graduate studies varies in the literature with some researchers supporting its use, whereas others suggest discontinuing the GRE requirement.

In a 2011 study of SRNAs, researchers found that undergraduate GPA, undergraduate science GPA, GRE total score, and critical care experience together accounted for 14.5% of the variance in student NAEP progression. Self-efficacy has been studied in terms of its ability to predict academic success in college students and nursing students. Several studies found that one’s academic self-efficacy accounted for 11% to 14% of variance in academic performance, persistence, and GPA in college students. Those mostly likely to withdraw from a nursing program had low academic self-efficacy.

The defining attributes of a self-efficacious individual include confidence, capability, persistence, and strength (Table 2). These are all qualities needed in the SRNA for successful NAEP completion. It is necessary for SRNAs to believe that they are capable of performing a task and reaching an objective and that they have the ability to carry out the task. SRNAs must have the ability to persist over the course of a 24- to 36-month program. It is also essential that SRNAs have strength, defined as the ability to perform in stressful situations, as this is where a great deal of their learning and future practice occurs.

Research needs to be done looking at the relationship of self-efficacy to academic success, specifically in SRNAs, as there is currently no literature on self-efficacy specifically in that population. The literature suggests that self-efficacy is context dependent, and in nursing education, assessing academic and occupational self-efficacy separately is most beneficial. Students in NAEPs will vary in age and thus have different levels of experience. Some students with a greater amount of professional experience may do well in clinical experiences (“clinicals”), but students who have been out school for less time may experience less stress in the academic arena. Lauder et al caution educators against accrediting self-efficacy as the means of all competence-associated change, success, and/or failure.

• Suggestions for Improving Student Self-Efficacy. The ideas for affecting self-efficacy suggested by nursing and nonnursing students could be applied in master’s or doctoral anesthesia programs to potentially increase self-efficacy and student retention. Students may need greater emotional and academic support earlier in their program. Recognition of the need for adequate feedback for students by NAEPs and CRNAs is important. For example, adequate feedback is essential for SRNAs in their journey through school. Classroom tests should be rigorous to prepare the SRNAs for the rigors of the National Certification Examination for Nurse Anesthetists and for the rigors of integrating theory into clinical practice. Tests should allow for students and faculty to assess the student’s knowledge. Likewise, clinical evaluations should use valid instruments to provide students with adequate feedback about clinical skills and growth through a NAEP. Clinical preceptors need to be honest and thorough when completing student evaluations. Students who do not know to work on their organizational and prioritization skills will fall behind and feel greater defeat when it is finally brought to their attention, negatively affecting self-efficacy. Clinical evaluation tools are not only for the student and school to document student growth in clinical competence but also can be used to increase the student’s confidence with adequate, honest, and specific feedback. In learning, it is beneficial for students to know what the expectations are for them in clinicals and to receive adequate feedback after the clinical experience.

A 2008 study reported some reasons for students withdrawing from NAEPs, including personal and health reasons, unawareness of time commitment, and job role or responsibility of a CRNA. In 1993, half of the students in one survey left the program for personal reasons, and the author ponders the connections between motivation and ability for program completion. If self-efficacy is about how one thinks one will do at a task, is it not necessary that one knows what is expected of one in the task? How aware are students of the expectation, rigor, and responsibilities in NAEP and anesthesia as a profession? This may limit their ability to rate their self-efficacy, as self-efficacy is context dependent.

In numerous ways, NAEPs can increase self-efficacy. These include mastery experiences providing students with strong indicators of capabilities, vicarious experiences with observation of others, role modeling, and verbal persuasion or other social influences. The term mastery experiences refers to an individual’s previous success at accomplishing a task or the accomplishment of a similar task, and these are the most effective way to increase self-efficacy.
self-efficacy. Interactive mastery experiences such as with high-fidelity simulation are most powerful and are already used in many anesthesia programs. Student engagement through empowerment and the provision of adequate feedback for development of reasonable self-efficacy beliefs will lead to increasing self-efficacy, motivation, and adaptive behavior for skill mastery.

Stress experienced by students can have negative effects, and be interpreted by students as poor performance and internalized to decrease self-efficacy. Some stress can be seen by students as having a positive effect and can lead to increased self-efficacy. The influence of one’s physiologic and affective states on self-efficacy depends on the person’s interpretation of these. The high percentage of depression and suicidal ideation reported in SRNAs could have a negative impact on a student’s self-efficacy. Provision of stress management resources to help students deal with the physiologic and affective states that are stress related and have an impact on an individual’s self-efficacy could be beneficial.

SRNAs learn a stressful profession in a stressful operating room, and studies have demonstrated the presence of stress in SRNAs. Many studies reported the benefits of and needs for social support. Wildgust suggested that successful adaptation was most dependent on social support. Eighty-nine percent of students use support systems for coping. Perez and Carroll-Perez concluded that students depend and trust other SRNAs to help them cope by sharing their frustrations and concerns. In 2010, Phillips suggested increasing student motivation via a planned, professional-guided group counseling session. In a 2012 study, students asked for peer support and for integration of wellness into NAEPs. Another study reported a high demand for accessible stress management resources for SRNAs. With the documentation of stress in SRNAs, the benefits of social support, the use of social support systems by some SRNAs, and the need for social support requested by others, more research needs to be done regarding the types of social support available and used, as well as barriers to its use.

Future Research. Future research needs in this area include assessing attrition rates and their associated reasons to determine whether these rates have changed with implementation of doctoral programs. These rates were last reported from the 2005 cohort. The following questions should be addressed. How will students cope with the increased length and increased academic requirements of doctoral programs? Will they be able to handle continued stress for the increased duration with an increased workload? To what degree would increasing self-efficacy lead to decreased stress; increased use of positive coping mechanisms; increased SRNA wellness; and increased resiliency, academic success, and retention? Are there self-efficacy differences in frontloaded programs (programs in which a substantial amount of coursework is delivered before clinical education) vs integrated programs, or in master’s vs doctoral programs? What barriers do SRNAs perceive to utilizing the available resources currently within their programs?

Conclusion

The presence and use of social support can be protective for those experiencing adverse levels of stress. Three of Bandura’s 4 primary influences of self-efficacy—social persuasion, vicarious experiences, and emotion or somatic states—can be affected by either social support or stress management assistance. Social support and stress management assistance may not only improve the health and coping skills of SRNAs, but also increase self-efficacy, possibly leading to increased academic performance and retention. Academic self-efficacy accounted for 11% to 14% of the variance in academic performance, retention, and college GPA compared with a variance of 14% in student NAEP progression with the use of the 4 common criteria (undergraduate GPA and science GPA, GRE total score, and critical care experience) used in admission selection. Therefore, a study of self-efficacy in SRNAs is warranted. Benefits of increased self-efficacy would include students using approach vs avoidance behavior, quality performance, persistence for academic success, and increased student retention.

REFERENCES


**AUTHOR**

Megan Conner, CRNA, MSN, received her BSN in 2005 from the University of North Carolina, Greensboro (UNCG), and her MSN in nurse anesthesia from UNCG and Raleigh School of Nurse Anesthesia (RSNA) in 2009. She is currently a PhD student at the UNCG School of Nursing. She has been a CRNA at Nash Health Care Systems in Rocky Mount, North Carolina for 5 years. She is also the associate director of Didactic Education at RSNA.

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