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# The Development of an Assessment Plan for Wellness and Risk for Substance Use in Nurse Anesthesia Students

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**The Development of an Assessment Plan for Wellness and Risk for Substance Use in Nurse**

**Anesthesia Students**

Final Scholarly Project Report

by

Tessa Friend, BSN, RN & Lauren Zaleski, BSN, RN

Doctor of Nursing Practice Final Scholarly Project

In Partial Fulfillment of the Requirements for the Degree

Doctor of Nursing Practice

Otterbein University-OhioHealth Grant Medical Center Nurse Anesthesia Program

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DNP Final Scholarly Project Team:

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### **Abstract**

Student Registered Nurse Anesthetists (SRNAs) are at an increased risk for low levels of perceived wellness and substance use disorder (SUD) due to a multitude of factors. Disturbances in perceived wellness and SUD pose mental and physical risks to the student as an individual, and may have an impact on their academic and clinical performance. Designing an assessment plan for the evaluation of wellness and risk for substance use in the SRNA population may aid anesthesia program directors in identifying early warning signs, implementing wellness curricula tailored to their student's unique needs, and evaluating the effectiveness of these wellness curricula over time. The Council on Accreditation for Nurse Anesthesia Educational Programs (COA) has also recently updated their Standards for Accreditation to include a wellness and SUD curriculum. The purpose of this project is to design a needs assessment for a Doctor of Nursing Practice (DNP) program at a small university in the Midwest to evaluate the wellness level of their students in order to identify any potential gaps in the current wellness curriculum. The assessment will evaluate both qualitative and quantitative measures of perceived student wellness and risk for SUD, and consists of four reliable survey tools and open-ended questions. The assessment will be offered annually to students enrolled in the nurse anesthesia program via an online survey software, and participation will be voluntary. The results from the survey can be used both as a baseline assessment of wellness, and as a tool to evaluate if overall student wellness is improving over time.

### Introduction

Doctor of Nursing Practice (DNP) anesthesia programs are selective, rigorous, and time-consuming. Student Registered Nurse Anesthetists (SRNAs) partake in three years of challenging clinical schedules and didactic courses and complete a graduate-level scholarly project. The demands of full-time education combined with the stressors of everyday life put SRNAs at a heightened risk for low levels of perceived wellness and maladaptive coping mechanisms, such as substance use disorder (SUD). The prevalence of these problems may even be underreported due to various factors. Alterations in wellness and substance use disorder can also persist into students' professional lives after graduation, resulting in poor physical and mental wellbeing for the individual and harm to the healthcare workforce.

To address the issues of decreased wellness and substance use disorder in the SRNA population, the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) recently updated their standards for accreditation to include a wellness and substance use curriculum to increase awareness and wellness promotion. The recommended wellness and substance use curriculum includes the following five learning objectives:

1. **Importance of wellness to healthcare professionals:** Describe the integration of healthy lifestyles, adaptive coping behaviors and tools to prioritize self-care and lessen career stressors. Build awareness of risk factors for substance use and mental health disorder and suicidal ideation. For workplace wellness, introduce conversational strategies for effective communication and the role CRNAs can take in promoting a health work environment.
2. **Healthy lifestyles:** Describe attitudes, behaviors, and strategies (i.e., healthy nutrition and hydration, exercise, sleep patterns, risk reduction) to support personal and

professional wellbeing, encourage work/life balance, and mitigate physical or mental illness. Describe the effect of self-care as it relates to optimized patient safety.

3. **Mental wellbeing:** Describe adaptive behaviors to lessen the intensity of experienced stress and traumas to reduce the potential of unresolved feelings adversely affecting mental health. Discuss positive behaviors, feelings, and symptoms (observed or felt), indicated decline in ability to function to be able to recognize when professional mental health help is needed. Apply understanding to reduce stigma surrounding mental health challenges and treatment and know it is okay to ask for help when needed.
4. **Identifying and addressing SUD:** Describe basic pathophysiology and the disease model of addiction. Identify associated symptoms for early recognition. Describe the need and process for reporting a colleague to management to safely address. Identify and describe how to use safe appropriate strategies for successful intervention, evaluation and treatment, optimal treatment following recommendations specific to anesthesia professionals, aftercare, and monitoring for sustained recovery.
5. **Reentry into the workplace after treatment for SUD:** Broadly describes components of successful return to anesthesia practice. These components include the frameworks for returning to administrative, academic and/or clinical anesthesia practice; strategies to increase the likelihood of sustained recovery upon re-entering; and elements of lifestyle adaptation that lead to a healthy work/life balance for physical, emotional, and spiritual health (Council on Accreditation for Nurse Anesthesia Educational Programs, 2022, p. 42).

Restructuring and implementing new components of a wellness curriculum can be an overwhelming venture and can be accomplished by various methods. In order to get a baseline

understanding of perceived wellness in their students, the directors of a nurse anesthesia program at a small, private university in the Midwest are interested in an assessment plan to evaluate wellness and risk for substance use. The information obtained from the assessment plan can then be used to tailor their wellness curriculum to the unique needs of their students in alignment with the COA's standards. It can also work to continually evaluate the effectiveness of the updated wellness curriculum over time.

Exploration of current wellness resources available at the university showed a concentrated effort by faculty to educate students regarding professional issues related to anesthesia. The current curriculum, taking place during the Spring semester of the student's second year, includes unique risk factors for substance use disorder that anesthesia professionals experience and the importance of maintaining wellness to mitigate those risk factors and enhance the overall quality of life.

In addition to education provided by nurse anesthesia faculty, resources are available to students experiencing mental health alterations. The university offers counseling services free of charge, operating on a short-term therapy model, tailoring the number of sessions needed to each student's clinical needs. The counseling service may also refer students for long-term therapy as needed. The American Association of Nurse Anesthesiology (AANA) Peer Assistance Program also provides a 24/7 peer assistance hotline. The hotline was created to offer "support for CRNAs and student registered nurse anesthetists for all aspects related to drugs/alcohol impairment, suspicion of drug diversion, substance use disorder (SUD), adverse event support, and questions related to fitness for duty" (American Association of Nurse Anesthesiology [AANA], 2022, para. 1). The peer assistance hotline provides direction to resources that fit the immediate need of the caller.

### **Significance of the Problem to Nurse Anesthesia**

The American Association of Nurse Anesthesiology (AANA) defines wellness as “a positive state of the mind, body, and spirit reflecting a balance of effective adaptation, resilience, and coping mechanisms in personal and professional environments that enhance quality of life” (American Association of Nurse Anesthesiology [AANA], n.d., para 1). Healthcare workers and graduate students, both roles that a SRNA takes on, meet barriers in maintaining wellbeing.

Examples of these barriers include:

- Increased sense of responsibility and vulnerability while learning in a patient care environment.
- Adopting a new student role.
- Management of personal responsibilities.

A student’s inability to adapt to stressors or utilize positive coping mechanisms may result in several adverse outcomes, including suboptimal academic and clinical performance as students, occupational underperformance as future CRNAs, and alterations in mental and physical health.

SRNAs and anesthesia professionals are at an increased risk for experiencing high levels of perceived stress and decreased levels of perceived wellness (Bryson, 2019; Chipas et al., 2012). Nurse anesthesia students, in particular, perceive increased levels of stress, anxiety, and decreased levels of wellbeing compared to their peers of similar occupations and educational cohorts (Chipas et al., 2012). The elevated stress and anxiety levels can affect student performance in both didactic and clinical roles. Students with lower levels of wellness are at a higher risk of attrition and perceive poorer academic performance (Mesisca & Mainwaring, 2021). Additionally, students with higher anxiety levels are more likely to make errors in

simulation learning experiences (Pitt et al., 2012). Unmanaged stress and anxiety can negatively affect both didactic and hands-on learning.

Attrition, or the loss of students who fail to re-enroll in successive semesters, is often an educational process outcome. Attrition rates could be of interest to both nurse anesthesia graduate programs and the nurse anesthesia profession as a whole because of the financial implications and loss of workforce after the loss of a nurse anesthesia student. The position of a withdrawn student is unable to be filled in the same academic year, resulting in the loss of a potential licensed CRNA joining the workforce with their planned cohort. Currently, tuition for a DNP anesthesia program can be as high as \$182,000 (*The cost of nurse anesthetist school*, 2022). This cost does not include the price of living expenses, loss of nursing income during education, or the cost associated with the turnover of an intensive care unit nurse. The retention of nurse anesthesia graduate students is essential to resource preservation of the student themselves, nurse anesthesia graduate programs, and the nurse anesthesia profession.

As individuals perceive increased anxiety or stress, they will use coping mechanisms, negative or positive, to attempt to maintain their mental health or wellness. Positive or adaptive coping mechanisms include seeking social support, physical activity, or reflective activities to process experience and emotion. Negative or maladaptive coping mechanisms include impulsive behavior, negative self-talk, or substance use. Individuals have many factors that influence what coping mechanisms they tend to use. Ideally, when faced with a stressor, students will turn towards adaptive coping mechanisms, but sometimes maladaptive coping mechanisms are utilized to relieve stress or anxiety.

Anesthesia professionals are at a greater risk of developing a substance use disorder, which the COA defines as: “a chronic and progressive disease which threatens physical and



mental health and is individually characterized by a multiplicity of behaviors from misuse through dependency/addiction to alcohol and/or drugs (legal and illegal)” (Council on Accreditation of Nurse Anesthesia Educational Programs, 2022, p. 42). Substance use in anesthesia professionals may be related to personal factors, the intensity of the profession, access to illicit substances, and even sensitization to the effects of anesthetic agents. The nature of substance use disorder leads to the risk of provider impairment, a threat to the provider’s mental and physical health, and decreased patient safety (American Association of Nurse Anesthesiology [AANA], 2021).

Recognizing that fluctuations of perceived wellness over time are normal and mental health alterations and substance use disorders are diseases of the brain are critical to addressing wellness promotion and substance use disorder prevention in the SRNA population. Early and effective wellness promotion, development of adaptive coping mechanisms, and recognition of individual risk factors for low perceived wellness and substance use disorder may play a role in preventing adverse outcomes for future CRNAs and the patients for whom they provide care.

### **PICOT Question/ Problem Statement**

(P) How do graduate nursing anesthesia students with (I) stressful academic and clinical environments and access to controlled substances perceive (O) academic and clinical performance, personal wellness, and student risk for substance use disorder during (T) the nurse anesthesia Doctor of Nursing Practice program?

### **Project Objectives**

Three main objectives were identified for this project:

1. Obtain an understanding of wellness and risk for Substance Use Disorder in Student Registered Nurse Anesthetists through an extensive literature review.

2. Develop evidence-based recommendations for assessing student wellness and risk for Substance Use Disorder to make appropriate updates to the wellness and SUD curriculum.
3. Disseminate findings to relevant stakeholders of a Nurse Anesthesia Program at a small private university in the Midwest.

### **Literature Review**

Research on wellness in nurse anesthesia graduate students is limited. Therefore, a literature search was conducted to determine common themes of stress and wellness and their effects on health science graduate students, healthcare providers, and nurse anesthesia students. Three databases were searched for the literature review: Cumulative Index of Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews (CDSR), and PubMed. Keywords included “wellness”, “stress”, “graduate students”, “healthcare providers”, “risk for”, “certified registered nurse anesthetists (CRNA)”, “student registered nurse anesthetists”, “SRNA programs”, “coping mechanisms”, “substance use” and “nurse anesthesia”. Boolean connectors included “and” and “or”. Results were initially limited to a timeframe of five years. Seminal articles pertaining to wellness and substance use disorder in nurse anesthetists were also included. Most results yielded cohort studies, yet some systematic reviews were available. Thirty-two articles were selected for rapid critical appraisal (see Appendix H).

### **Wellness in Health Science Graduate Students and Healthcare Providers**

Stress is an inherent part of life. Reasonable amounts of stress are necessary for motivational purposes; however, heightened or unmanaged stress may lead to adverse outcomes (Griffin et al., 2017). While stress is common to all populations and is experienced uniquely by each individual, higher levels of perceived stress are present in graduate students of health

science professions, including SRNAs (Chipas & McKenna, 2012). Health science graduate students may be at a higher risk for adverse health concerns and burnout due to their academic programs' high-stress nature and rigor (Hoying et al., 2020). The stress graduate students experience tends to fluctuate throughout their programs and may develop into negative psychological disturbances. In particular, nurse anesthesia students experience stress stemming from fulfilling the role of both the student and the provider, opening them to the possibility of mismanaging stress and negatively affecting their wellness and performance (American Association of Nurse Anesthetists, n.d.).

In healthcare, occupational stress levels are higher than average (Shearin & Brewer-Mixon, 2020). Within the healthcare field, anesthesiology professionals have unique challenges that affect wellness levels (Bozimowski et al., 2014). Anesthesia students face many stressors as they assume their role, including the intellectual, procedural, technical, and logistical skills required of them (Eisenach et al., 2015). Management of responsibilities in an operating room environment can largely influence their mental, emotional, and physical wellbeing (Bozimowski et al., 2014).

### **Sources of Stress**

Sources of stress that graduate students experience tend to be multifactorial. In a cross-sectional study of SRNAs and their perceived stress, the three major types of stressors identified were academic, clinical, and external (Chipas et al., 2012). The authors further elaborate that anesthesia is learned in stressful classroom and clinical environments where students are bombarded with lectures and skill challenges, all while financial and social concerns commonly experienced by all persist in the background. SRNAs must cope with becoming novices again after being proficient ICU bedside nurses, relearn how to function as students, and continue to

deal with their everyday external stressors. Some examples of external stressors include financial strain, issues with time management and role responsibilities, maintaining relationships, and competing obligations (Stillwell et al., 2017). According to Griffin et al. (2017), SRNAs also experience a heightened sense of liability and vulnerability and report altered living routines, sleep deprivation, and lack of leisure time.

### **Physiologic Effects of Stress and Wellness Levels**

While mild stress is normal day-to-day, chronic stress can cause prolonged activation of stress hormones and the sympathetic nervous system, resulting in short-term and long-term effects. Short-term effects, like heightened awareness, can be helpful in academic and clinical settings. However, long-term effects of stress can lead to chronic issues, including cardiovascular, respiratory, and gastrointestinal dysfunction (American Heart Association [AHA], 2014).

Stress hormone activation and sympathetic stimulation occur in academic and clinical settings for graduate nurse anesthesia students. Ringeisen et al. (2018) noted that students with higher pre-exam anxiety were more likely to have higher cortisol levels. The increase in cortisol levels may be attributed to highly anxious students being more reactive to stress and perceiving academic challenges as a danger or threat to themselves rather than as a learning experience as intended.

Furthermore, physical manifestations of prolonged or uncontrolled stress may include inflammatory responses, a weakened immune system, and impaired cardiovascular and pulmonary regulation (Stillwell et al., 2017). Research has shown that psychological and physiologic changes occur as anesthesia residents enter their clinical experience, including increased perceived stress and anxiety levels, serum epinephrine, and salivary cortisol (Eisenach

et al., 2015). These authors also noted that the anesthesia residents presented with decreased energy levels, concentration, and sleep quality. Mental and physical health are intertwined to such a degree that as nurse anesthesia students face intellectual challenges, their physical health can be affected certainly in the short term, but with possible long-term effects (Eisenach et al., 2015).

The prevalence of adverse mental health outcomes in health science graduate students is also a concern. Graduate students as a whole are at a higher risk for depression and anxiety due to the stressors of their academic program and the developmental events that may occur specific to their age range (Rith-Najarian et al., 2019). Furthermore, the Center for Collegiate Mental Health (2020) reported that over half of annual campus clinic visits are anxiety-related.

### **Effects of Stress on Overall Wellness and Performance**

Wellness and stress levels play a role in student performance in the classroom and clinical environments. According to Shearin & Brewer-Mixon (2020), graduate students with mental health disturbances (anxiety and depression) had lower grade averages, poor relationships with other students and faculty, and lower graduation rates. Increased errors during patient scenario simulations occur in students with higher pre-simulation stress and anxiety (McKay et al., 2010; Pitt et al., 2012). Further study into the effect of stress and anxiety on academic success is warranted to evaluate the overall effect on student achievement outside of laboratory simulation.

While simulations eliminate the possibility of actual harm, one must consider that if stress can lead to error in a simulated environment, stress may also lead to actual clinical error. Studies show that in CRNAs who are clinically active, there is a direct correlation between their scope of practice and occupational stress level (Alves, 2005). With the management of increased

occupational stress through coping resources and social support, a balance of effective adaptation and resiliency that maintains wellness may be attained. All healthcare practitioners are vulnerable to human error that can affect patient safety. It is essential to consider every avenue of risk reduction, including monitoring and managing stress and wellness levels (Alves, 2005).

### **Wellness Management**

Personality factors such as self-efficacy and emotional intelligence tend to lower academic anxiety and workplace stress (Alves, 2005; Bittinger, 2020). Positive coping mechanisms like emotionally focused coping with social support and problem-focused coping with planning are more effective in high-stress environments than negative coping mechanisms, such as mental and behavioral disengagement. Attempts to cultivate and grow these qualities in future CRNAs could increase the wellbeing of the future workforce.

Several studies have been conducted to evaluate the effectiveness of wellness curriculums or programs tailored to graduate students within the health sciences. Within the selected articles for this literature review, these wellness programs differed in content and methodology, but all studies endorsed improvements in their outcome measures. These outcome measures were assessed using different tools to evaluate perceived stress, perceived wellness, depression, anxiety, somatic symptoms, and other traits over time.

Skills taught to students included but were not limited to: how to improve lifestyle habits (diet, sleeping, exercise), relaxation and de-stressing techniques (music, meditation), adaptive coping mechanisms, and cognitive behavioral therapy. In one study, an educational program benefited from implementing a wellness program focusing on weekly in-person sessions to discuss academic stress and online guided meditations (Gutman et al., 2020). Students enrolled in this study reported lower stress levels and increased stress management skills.

While teaching adaptive coping mechanisms and wellness strategies is essential, faculty and support systems play a significant role in student wellness. Studies show that students with higher social and faculty support feel a greater sense of health, have decreased stress (Jeong & Koh, 2021), and have a higher GPA and lower attrition rate (Pitt et al., 2012).

Sharp and Burkart (2017) reviewed medical trainee wellness from business perspectives, wellness promotion and burnout prevention strategies, program and individual trainee wellness strategies, and wellness initiatives to improve the quality of life of medical trainees. The authors defined *wellness* as thriving and meeting challenges with personal and professional success. Wellness intervention recommendations included: the creation of a supportive institutional environment and management style, implementation of a wellness committee, assessment of trainee wellness and burnout needs through quantitative tools, and small group training in stress management, self-care, communication, and mindfulness (Sharp & Burkart, 2017). Notably, the study noted that consistent reassessment of wellness and burnout levels would optimize intervention effectiveness as the program continued.

In another study, Stillwell et al. (2017) conducted a systematic review of existing evidence on the practice of self-care interventions and their effect on perceived stress levels on graduate nursing students. There is a gap in the literature on wellness studies on graduate nursing students alone, so inclusion criteria ultimately included other health science graduate programs. The research focused on eight wellness promotion interventions: stress management courses, mind-body-stress reduction programs (MBSR), yoga, mindfulness, breathwork, and meditation. Eight studies of the 5,108 articles reviewed were included in the literature review. All eight articles reported decreased perceived stress levels after the intervention implementation. The evaluation included statistical analysis of the Perceived Stress Scale (PSS), attrition rates, and

applicability to a nursing graduate program. Based on the literature review, the authors ultimately recommended a wellness program including a didactic element, a weekly MBSR activity taught by a trained professional, and a homework assignment to evaluate learning.

Mental health is ultimately the responsibility of each individual. However, interventions and lifestyle changes that can be taught and implemented by universities may give students (and healthcare professionals) the tools to better their ability to ensure their wellbeing. Recurrent themes in the studies on successful wellness curricula emphasized early teaching of healthy coping mechanisms in graduate school, fostering personality factors to increase resilience, a sense of social support, and frequent reassessment of wellness levels. Early initiation and effective effort are imperative to ensure these methods' longevity throughout the students' future careers, ensuring a healthy workforce and avoidance of maladaptive coping mechanisms (such as substance abuse) later on.

### **Substance Use Disorder in Anesthesia Providers**

Substance use is a physiologically complex negative coping mechanism that can lead to substance use disorder, now recognized and treated as a medical condition. According to the AANA, anesthesia providers are at disproportionately significant risk of a substance use disorder, with an estimated 10%-15% of all healthcare professionals misusing illicit substances in their careers (AANA, 2021, p. 3). Bryson (2020) reports that anesthesia residents report substance use disorder in 2.87 per 1000 individuals. The discrepancy could be related to increased demands of the anesthesia profession or accessibility and knowledge of pharmacodynamics of illicit substances. Bryson (2020) noted that many signs of substance use in anesthesia providers go unnoticed because of specialized knowledge in dosing of medications and counteractive effects of drug classes (i.e.: midazolam to counteract hyperexcitability related



to cocaine use). This specialized skill set leads to death commonly being the first sign of substance use disorder in anesthesia professionals. Bomzimowski et al. (2014) reported an estimated 5-year prevalence of substance abuse rate of 0.65% in student registered nurse anesthetists. The study specifies that this prevalence rate was only based on documented incidents within nurse anesthesia programs. There was high suspicion for students under-reporting based on the fear of the stigma surrounding substance use disorder. Regardless of the prevalence rate, all impaired health practitioners put themselves and their patients at higher risk for adverse events (Bryson, 2020).

### **Substance Use Disorder Risk Assessment and Prevention**

In a national survey of program directors of nurse anesthesia programs, the most commonly used prevention strategy for substance use was faculty support (Bozimowski et al., 2014). Risk assessment for substance use disorder is not widely used. In the survey conducted by Bomzimowski et al., only 25% of the documented cases had a personal history of substance use (2014). The benefit of a screening tool would be identifying individuals at risk and focusing on building positive coping skills to manage stress and ultimately improve wellbeing to prevent harmful coping mechanisms like self-isolation and substance use.

### **Substance Use Identification**

In students affected by SUD, a significant component of reducing harm to the student and the patients under their care is early identification of behaviors typically associated with drug diversion or SUD. Early recognition followed by early intervention is among the most critical factors in successful recovery from substance use disorder among nurse anesthesia professionals (Wright et al., 2012).

Behaviors and signs of drug diversion and impairment include but are not limited to: frequent voluntary overtime, increased usage of narcotics compared to other colleagues, mood swings, difficulty maintaining professional and personal relationships, poorly explained errors in clinical performance, frequent narcotic discrepancies, and higher documented patient pain scores when compared to patients of other anesthesia providers (AANA, 2021). If anesthesia professionals are well versed in signs and behaviors that may indicate substance use disorder, they can report signs to a well-organized chain of command. Early recognition allows early intervention to occur, creating an environment of increased provider health and patient safety.

### **Conflicting Information**

While most of the literature shared similar trends in statistics and information, there was some conflicting data. For example, many articles discussed how high-stress levels or low perceived wellness were associated with poor academic performance. However, a study examining wellness and thriving in SRNAs determined that overall wellness was not correlated with overall GPA, which could indicate academic performance (Griffin et al., 2017). Furthermore, there were some drastically varying reports of the prevalence of stress and mental health issues within study samples. However, this may be due to sample size, type of health science program, or other extraneous factors.

### **Strengths and Limitations**

Consistent themes and supporting data were present throughout the selected articles for this review, contributing to one of its greatest strengths. The literature review also included two systematic reviews, considered level I evidence.

There are some weaknesses and limitations to be noted. Some of the studies conducted were cross-sectional cohort studies with relatively small sample sizes, which may limit the

generalizability to broader populations. Furthermore, some studies evaluated stress and wellness in graduate students of health science professions, although some did not specifically include nursing graduate students or SRNAs. While some programs may have comparable levels of perceived stress, programs are unique in their challenges and characteristics, so the data may not be translatable to graduate nursing students or SRNAs in particular.

### **Theoretical Framework**

The theoretical framework used for this project was The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Model. This model ensures that the most up-to-date evidence is used to guide inquiry into practice improvement. The model contains six primary components: inquiry, practice question, evidence, translation, best practices, and practice improvements (Johns Hopkins Medicine, n.d.). The components exist in a linear order, but steps can be revisited at any point in the quality improvement process. The “inquiry” and “practice question” of this DNP project pertained to understanding how nurse anesthesia graduate students perceive their wellbeing. Through the literature review, translation of evidence gathered from the literature review, and the recommendations made for stakeholders, the “evidence”, “translation”, and “best practices” components of the JHNEBP model were fulfilled. The time constraints of this scholarly project did not allow for the implementation of the assessment or the analysis of findings. However, implementation would have been the next step in the JHNEBP Model with the ability to revisit each step to improve practice.

### **Recommendations**

#### **Development**

Qualitative and quantitative data will be collected to evaluate the student nurse anesthetist population’s wellness and substance use disorder risk at specified points throughout their

education. Qualitative data will be gathered via open-ended survey questions of the program director's choosing. The open-ended questions may inquire about topics such as, but not limited to: sleeping/lifestyle habits, amount of time students have available to study, social support, and opinions about the program in which the student is enrolled. The goal of the open-ended questions is to identify and better understand perceived barriers to wellness and unique stressors that each cohort faces at their level of study in an anonymous fashion, assisting program directors in tailoring the wellness curriculum to the needs of their current students.

Quantitative data will also be gathered via an anonymous online survey. Selected tools presented in this survey include the COPE Inventory, Substance Use Risk Profile (SURP) Scale, Perceived Stress Scale (PSS), and the Medical Student Well-Being Index (MSWBI).

The COPE Inventory, developed by John Carver (1997) assesses an extensive range of coping responses to stressful events (see Appendix B). The complete questionnaire is 60 questions, and a brief COPE inventory of 28 questions exists if there is a high response burden (Carver, 1997). The questionnaires include functional and dysfunctional coping mechanism statements and allow the participant to rate the frequency of each statement as it applies to themselves. The brief COPE inventory had a Cronbach's Alpha of 0.88 among 423 nurses making it a reliable tool for nurse anesthetist graduate students (Abdul Rahman et al., 2021).

The SURP Scale is a 28-item questionnaire developed by Woicik et al. (2009) constructed to assess four motivational profiles for alcohol and drug use, including anxiety sensitivity, hopelessness, sensation seeking, and impulsivity (see Appendix E). Each personality trait is hypothesized to relate to specific patterns of substance use differentially. The participant rates the degree to which they agree with each statement about themselves. The SURP Scale is unique because it measures risk for substance use based on personality factors and does not

require a prior history of substance use. The questionnaire showed good reliability and validity within high school and undergraduate populations, but no Cronbach's alpha was disclosed.

The Perceived Stress Scale (PSS) created by Sheldon et al. (1983) is a 14-item assessment tool that evaluates the degree to which situations in one's life are appraised as stressful over the last month (see Appendix C). The participant is asked to rate the frequency of their emotional reaction to stress from 0-4, with 0 being 'never' and 4 being 'very often'. The PSS showed good reliability with a Cronbach's Alpha  $>0.8$  in two undergraduate populations with scores correlating with physical symptoms of increased stress (Cohen et al., 1983).

The Medical Student Wellbeing Index (MSWBI) can identify individuals with distress and those who are thriving (see Appendix D). The survey was developed by Dyrbye et al. (2010) to measure several dimensions of student distress and identify students whose distress places them at risk for severe consequences. The six domains of wellness, including fatigue, depression, burnout, anxiety, stress, and mental/physical quality of life, are measured via a six-question 'yes or no' survey. A high score on the MSWBI indicates poor wellbeing with a greater risk of personal or professional compromise. In contrast, a low score indicates higher wellbeing or thriving. The MSWBI demonstrated good overall reliability and validity for measuring nurse anesthesia student wellness and has been validated in medical student populations with high reliability (Yosoff et al., 2013).

### ***Council on Accreditation for Nurse Anesthesia Educational Programs Guidelines***

The selection of the four tools mentioned above are made to specifically assess components relating to the COA's learning objectives of a wellness and SUD curriculum in the following ways:

1. COPE Inventory assesses adaptive and maladaptive coping behaviors (referenced in objectives 1, 2, and 3).
2. Substance Use Risk Profile Scale: identifies risk factors for the development of a Substance Use Disorder (referenced in objectives 1 and 4).
3. Perceived Stress Scale: evaluates stress levels in response to life events (referenced in objective 3).
4. Medical Student Well-Being Index: evaluates components of overall wellbeing.

## **Implementation**

### ***Timeline***

The wellness assessment can be implemented by the program director(s) directly or by an individual or group the nurse anesthesia program director's choosing. If students are utilized to implement the assessment plan as a DNP project, these students must first acquire approval from the Institutional Review Board (IRB) for gathering data from human subjects. Using survey software, such as SurveyMonkey, a link will be generated to a webpage containing the survey tools (PSS, MSWBI, COPE Inventory, SURP Scale) and open-ended questions of the program directors' choosing. The link will be sent to students via a recruitment email (see Appendix F). Within the recruitment email, students will be informed of the purpose of the survey and the anonymous nature of the data collection. The email will also explain that participation is strictly voluntary.

The survey will be sent out to all students enrolled in the anesthesia program at the beginning of the fall semester. The survey will remain open over the course of the semester, from approximately the end of August to the beginning of December. Fall semester will be optimal timing, as the first-year students will have had one semester of didactic courses completed, and

the second-year students will have been in clinical for approximately four months. Reminder emails may be sent out at repeated intervals of the program director's choosing over the course of the semester to encourage participation.

Upon completion of the semester and closing the survey, interpretation of the results can occur in several ways. Quantitative data gathered from the four survey tools (PSS, MSWBI, COPE Inventory, and SURP Scale) can be analyzed through a combined approach of inferential and descriptive statistics. Simple averages and trends from student responses can provide valuable information about perceived wellness and risk for substance use at that point in time. In-depth statistical analysis can be completed by a statistician if so desired by relevant stakeholders. Information gathered from the supplementary open-ended questions can be taken at face value or may be analyzed by a statistician via open coded thematic analysis to identify themes in student responses, if so desired.

Throughout the subsequent spring and summer semesters, program directors can use the information gathered from the wellness assessment to identify common themes in overall student wellness and implement promotion measures in the curriculum to address common gaps. The same wellness assessment will then be sent out to students the following Fall semester, allowing program directors to see if the wellness promotion measures have effectively improved overall wellness of the student body and reduced risk for substance use and other maladaptive coping mechanisms. This process will then be repeated yearly to monitor wellness over time.

### ***Budget***

Implementing a wellness assessment plan is a relatively low-cost venture. A subscription to SurveyMonkey is \$28 per month, which equates to approximately \$112 for the amount of time the survey will remain open each year. Free survey software options are available, but they may

not include the features necessary for the scope of this assessment. If the program directors desire an in-depth analysis of the data, hiring a statistician would be an additional monetary cost. Fees for a statistician vary, but fixed rates for a single project can range from \$400 to \$800.

As this project solely outlines the implementation of a wellness assessment, the cost of implementing new components of a wellness curriculum has not been included in this budget. Additionally, as mentioned in the literature review, there are many interventions that can be utilized in the development of a new wellness curriculum. Based on the responses from the wellness assessment, specific wellness measures may be more appropriate to use than others. Due to the unpredictability of which interventions will be utilized, the cost of intervention implementation cannot be calculated at this time.

### ***Project Facilitators***

The primary facilitators of the wellness assessment would include the nurse anesthesia program directors. If faculty collaborate with students to carry out the assessment as a DNP project, they would also be included as primary facilitators. Collaboration may also occur with the institution's available wellness resources to implement new strategies in the SRNA wellness curriculum.

### **Monitoring Outcomes**

The primary measure of success for the wellness assessment is an adequate response rate from students. Ideally, 75% of students from each cohort (first-, second-, and third-year) will complete the survey by the end of each fall semester to gain information about overall wellness that is representative of the majority.

Over time, trending improvements in the student responses would be an additional measure of success, which is outside of the time constraints for this project. Improvement would



be indicated by lower average scores on the Perceived Stress Scale and Medical Student Well Being Index, and the utilization of more adaptive coping mechanisms per the COPE Inventory. These measurements would be compared from year-to-year, which would allow program directors to determine if new wellness interventions have been successful in improving the overall wellness of their students.

### **Optimizing Outcomes**

The primary barrier to success for a wellness assessment is a low response rate. The need to evaluate multiple components that affect wellness requires several survey tools, which may be perceived as a time-consuming burden to students with already packed schedules. In order to minimize the response burden, brief versions of the survey tools may be used. Instead of sending out the survey via email once at the beginning of the semester, reminder emails may be sent out every 2-3 weeks in addition to announcements made in class.

Ethical obligations will also need to be adhered to when addressing the wellness levels of human subjects. While survey scores are anonymous, individuals who score as ‘high risk’ for low wellness levels, high-stress levels, and high substance use disorder risk need to be able to self-identify and have access to current resources to address their risk level. To address this moral obligation, after survey completion, students will be able to view their scores with their subsequent meaning. They will be provided with links to available mental health and wellness resources on campus.

### **Summary**

SRNAs are at increased risk for stress, decreased wellness, and substance use disorder. Altered wellness and substance use disorder can lead to adverse outcomes in students’ health and impair their practice as anesthesia professionals. Literature shows that early and effective

wellness promotion and recognition of risk factors for maladaptive coping mechanisms can improve an individual's ability to maintain their quality of life and may even decrease the risk of future substance use disorder.

Currently, no universal assessment plan exists to evaluate wellness and risk for substance use disorder in SRNAs. Based on the literature, the COPE Inventory, Perceived Stress Scale, Medical Student Well-Being Index, and SURP Scale are reliable tools to measure wellness and risk for SUD in populations similar to SRNAs. Using these tools to create an assessment plan for SRNA programs may effectively evaluate wellness levels and allow wellness promotion efforts that are tailored to the program's needs. To create an evidence-based assessment plan, project objectives included:

1. Obtain an understanding of wellness and risk for Substance Use Disorder in Student Registered Nurse Anesthetists through an extensive literature review.
2. Develop evidence-based recommendations for assessing student wellness and risk for Substance Use Disorder to make appropriate updates to the wellness and SUD curriculum.
3. Disseminate findings to relevant stakeholders of a Nurse Anesthesia Program at a small private university in the Midwest.

The project members identified a professional and educational problem related to nurse anesthesia, performed a literature review to understand the topic of wellness and substance use disorder in the SRNA population. They analyzed and synthesized the evidence and developed an evidence-based strategy to assess the wellness levels, needs, and risk for substance use disorder in a Nurse Anesthesia program at a small Midwestern private university. The proposed strategy includes using quantitative survey tools and qualitative surveys of current students, expected

outcomes of those surveys, and exploration of literature for wellness promotion that has been effective in other health science graduate populations to meet the expected needs. Dissemination to stakeholders is planned for the spring/summer 2022 semester.

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**Appendices**

**Appendix A**

**Otterbein University**

**IRB Exemption Statement**

**Conversation between IRB Chair, Dr. Noam Shpancer and Dr. John Chovan, Department of Nursing Chair.**

**From: Shpancer, Noam <nshpancer@otterbein.edu>**

**Sent: Wednesday, October 13, 2021 9:44 AM**

**To: Chovan, John <jchovan@otterbein.edu>**

**Subject: Re: IRB and DNP Projects**

**John: The way I see it, a project is not subject to IRB review unless and until it collects data from human participants. So, I agree with you that these projects will not need IRB approval until someone decides to implement them for data collection, at which point that person may apply for IRB approval.**

**Thanks, Noam.**

**From: Chovan, John <jchovan@otterbein.edu>**

**Sent: Wednesday, October 13, 2021 9:10 AM**

**To: Shpancer, Noam <nshpancer@otterbein.edu>**

**Subject: IRB and DNP Projects**

**Good morning, Noam,**

**I could use some advice -- maybe a conversation -- about the Doctor of Nursing Practice final scholarly projects and submitting for IRB approval. The projects parameters from our accreditors for some of the projects have changed. The list of acceptable projects now includes the option of writing a plan for a project that is not implemented. So, it can effectively stop at the proposal stage, and then these projects can be available for a future student to implement if someone has that interest. I have at least two questions.**

**1. The IRB Guidelines states "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge." Most of these projects are not intended to develop or contribute to generalizable knowledge. They are clinical change projects that are intended to eventually change a clinical practice of health care professionals (humans) in one identified setting. They have the possibility of contributing to generalizable knowledge in that each would be an instance of a clinical change that, if implemented in other places by others, could eventually be generalized. But that is not the primary intent of the projects. Would they be considered research? I think they would not.**

**2. If indeed they are considered research and should be submitted for review by the IRB, at what point in the process should IRB approval be obtained? I would think that although implementation is not part of the initial project, review by IRB would be helpful to the original team in shaping their project plan. Yet if this proposal is not going to be implemented, then the approval to move forward would be moot. But if a second team eventually reads the proposal and wants to implement it, would they be the ones seeking IRB approval?**

**If you would prefer that we talk in real time, I am open to that. Or perhaps you could visit one of our faculty meetings for a discussion?**

**Thank you.**

**Best,**

***John***

***John D. Chovan, PhD, DNP, RN, CNP, CNS, PMHNP-BC***

***Associate Professor & Chair, Department of Nursing***

***Chief Nurse Administrator***

***Otterbein University***

***"A comprehensive institution with a strong liberal arts base"***

***jchovan@otterbein.edu; 614-823-1526, voice; he/him/his***

***"The world is starved for grace. If we are going to work at restoring fellowship and reaching people, we need grace now more than ever."***

***- Pastor John Swadley, Forest Park Baptist Church, Joplin, Missouri***

## Appendix B

### COPE Inventory

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress. Then respond to each of the following items by blackening one number on your answer sheet for each, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no “right” or “wrong” answers, so choose the most accurate answer for YOU--not what you think “most people” would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don't do this at all

2 = I usually do this a little bit

3 = I usually do this a medium amount

4 = I usually do this a lot

1. I try to grow as a person as a result of the experience.
2. I turn to work or other substitute activities to take my mind off things.
3. I get upset and let my emotions out.
4. I try to get advice from someone about what to do.
5. I concentrate my efforts on doing something about it.
6. I say to myself “this isn't real.”
7. I put my trust in God.
8. I laugh about the situation.
9. I admit to myself that I can't deal with it, and quit trying.
10. I restrain myself from doing anything too quickly.

11. I discuss my feelings with someone.
12. I use alcohol or drugs to make myself feel better.
13. I get used to the idea that it happened.
14. I talk to someone to find out more about the situation.
15. I keep myself from getting distracted by other thoughts or activities.
16. I daydream about things other than this.
17. I get upset, and am really aware of it.
18. I seek God's help.
19. I make a plan of action.
20. I make jokes about it.
21. I accept that this has happened and that it can't be changed.
22. I hold off doing anything about it until the situation permits.
23. I try to get emotional support from friends or relatives.
24. I just give up trying to reach my goal.
25. I take additional action to try to get rid of the problem.
26. I try to lose myself for a while by drinking alcohol or taking drugs.
27. I refuse to believe that it has happened.
28. I let my feelings out.
29. I try to see it in a different light, to make it seem more positive.
30. I talk to someone who could do something concrete about the problem.
31. I sleep more than usual.
32. I try to come up with a strategy about what to do.
33. I focus on dealing with this problem, and if necessary let other things slide a little.

34. I get sympathy and understanding from someone.
35. I drink alcohol or take drugs, in order to think about it less.
36. I kid around about it.
37. I give up the attempt to get what I want.
38. I look for something good in what is happening.
39. I think about how I might best handle the problem.
40. I pretend that it hasn't really happened.
41. I make sure not to make matters worse by acting too soon.
42. I try hard to prevent other things from interfering with my efforts at dealing with this.
43. I go to movies or watch TV, to think about it less.
44. I accept the reality of the fact that it happened.
45. I ask people who have had similar experiences what they did.
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.
47. I take direct action to get around the problem.
48. I try to find comfort in my religion.
49. I force myself to wait for the right time to do something.
50. I make fun of the situation.
51. I reduce the amount of effort I'm putting into solving the problem.
52. I talk to someone about how I feel.
53. I use alcohol or drugs to help me get through it.
54. I learn to live with it.
55. I put aside other activities in order to concentrate on this.
56. I think hard about what steps to take.



57. I act as though it hasn't even happened.

58. I do what has to be done, one step at a time.

59. I learn something from the experience.

60. I pray more than usual.

## Appendix C

### Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate your response by rating each item by HOW OFTEN you felt or thought a certain way, scoring: zero (never), one (almost never), two (sometimes), three (fairly often), or four (very often). Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count

up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and "stressed"?
4. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
5. In the last month, how often have you felt confident about your ability to handle your personal problems?
6. In the last month, how often have you felt that things were going your way?
7. In the last month, how often have you found that you could not cope with all the things that you had to do?
8. In the last month, how often have you been able to control irritations in your life?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you found yourself thinking about things that you have to accomplish?
11. In the last month, how often have you been able to control the way you spend your time?

12. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

**Appendix D**Medical Student Well-being Index

Do you worry that medical school is hardening you emotionally?

During the past month have you often been bothered by feeling down, depressed, or hopeless?

In the past month, have you fallen asleep while stopped in traffic or driving?

During the past month, have you felt that all things you had to do were piling up so high that you could not overcome them

During the past month, have you been bothered by emotional problems (such as feeling anxious, depressed, or irritable)?

During the past month, has your physical health interfered with your ability to do your daily work at home and/or away from home?

## Appendix E

### Substance Use Risk Profile Scale

Rate each statement 0-4 to the extent in which you agree (0= strongly disagree, 4= strongly agree).

1. I am content.
2. In stressful situations, I often fear that no one will reach me in time.
3. I often don't think things through before I speak.
4. I would like to skydive.
5. I am happy.
6. I get frightened and feel that I am losing my mind when I cannot concentrate on the things that I need to do.
7. I often involve myself in situations that I later regret being involved in.
8. I enjoy new and exciting experiences even if they are unconventional.
9. I have faith that my future holds great promise.
10. It's frightening to feel dizzy or faint.
11. The most interesting and exciting things are usually illegal or immoral.
12. I like doing things that frighten me a little.
13. Sometimes I think I am no good at all.
14. It frightens me when I feel my heart beat change.
15. I usually act without stopping to think.
16. I would like to learn how to drive a motorcycle.
17. I feel proud of my accomplishments.
18. I get scared when I'm too nervous.
19. Generally, I am an impulsive person.

- 20. I am interested in experience for its own sake even if it's illegal.
- 21. I feel that I am a failure.
- 22. I get scared when I experience unusual body sensations.
- 23. I'm stubborn and strong-minded and act upon my thoughts despite others' opinions.
- 24. I would enjoy hiking long distances in wild and uninhabited territory.
- 25. I feel pleasant.
- 26. It scares me when I'm unable to focus on a task.
- 27. I feel I have to be manipulative to get what I want.
- 28. I am very enthusiastic about my future.

## Appendix F

### Sample Recruitment Email

Hello,

Our name(s) is/are [INSERT NAME] and we are [INSERT TITLE AND ORGANIZATION]. We are contacting you because you are a student enrolled in the [INSERT PROGRAM NAME]. We are contacting you because we are interested in assessing current wellness levels, risk for substance use disorder, and other wellness factors in nurse anesthesia graduate students.

Participation in this assessment involves completing a series of anonymous survey tools online that evaluate your perceived wellness and stress levels, coping styles, substance use risk factors, and health maintenance patterns. Additionally, open-ended questions will be used to gather qualitative data regarding your shared experiences as you progress through the program, and explore your perceptions, attitudes, and feelings regarding your wellness and stress levels and management in each phase of the nurse anesthesia program. Any information gathered will be de-identified. Participation in all parts of this assessment would take approximately 2 hours of your time. [OPTIONAL]: In appreciation of your time commitment, your name will be put into a drawing for your cohort for a [INSERT PRIZE].

A link to the anonymous online survey is provided below. If you have any questions please contact us at [INSERT EMAIL]

Sincerely,

[INSERT NAMES]

## Appendix G

### Sample Informed Consent

The [DEPARTMENT/UNIVERSITY] supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

We are interested in studying the effects of stress, coping mechanism usage, and health maintenance patterns on perceived wellness and risk of substance use. You will be participating in an online survey to evaluate perceived wellness. It is estimated that this will take no more than two hours of your time if participating in all activities. Although it is not likely, there is a chance that you might feel slightly uncomfortable with some of the questions. Although participation will not directly benefit you, we believe that the information will be useful in developing wellness promotion strategies that directly benefit the nurse anesthesia program.

Your participation is solicited although strictly voluntary. We assure you that your name will not be associated in any way with the research findings. The information will be identified only by a code number.

If you would like additional information concerning this study before or after it is complete, please feel free to contact me by phone or mail.

Sincerely,

[INSERT NAMES, EMAIL ADDRESSES, PHONE NUMBERS]

---

Signature of subject agreeing to participate

With my signature I affirm that I am at least 18 years of age.

By clicking on the (Next/Submit/>>>/I agree) button below, I consent to be in this study and affirm that I am at least 18 years of age. **\*For online survey\***



Appendix H

*****Perceived stress in graduate students/anesthesia profession*****									
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
Article 1:  Allen, H. K., Barrall, A. L., Vincent, K. B., & Arria, A. M. (2020). Stress and burnout among graduate students: Moderation by sleep duration and quality. <i>International Journal of Behavioral Medicine</i> , 28(1), 21–28. <a href="https://doi.org/10.1007/s12529-020-09867-8">https://doi.org/10.1007/s12529-020-09867-8</a>	Exploratory research	Online survey of students	2683 master’s, doctoral and professional graduate students from 2 large public universities	Independent variable: sleep duration and quality  Dependent variable: stress and burnout	Demographic characteristics, characteristics of graduate program, Perceived Stress Scale, Maslach Burnout Inventory-Student Survey, Pittsburgh Sleep Quality Index	Frequencies, means, and standard deviations for stress, exhaustion, cynicism, and inefficacy scores; point-biserial correlation  SPSS Version 25.0 used for all analyses with alpha set at 0.05	Average sleep 6.4 hours per night; stress had significant relationship with exhaustion, cynicism and inefficacy	Level VI	Weaknesses: may not be representative of actual graduate student population, some incomplete surveys, limited cross-sectional design  Strengths: validated instruments used to collect data, wide range of graduate students surveyed
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Article 2:  Alves, S. (2005). <i>A study of occupational stress, scope of practice, and collaboration in nurse anesthetists practicing in anesthesia care team settings</i> . <a href="https://www.aana.com/docs/default-source/wellness-aana.com-web-documents-(all)/alves_occupational_stress_act_aanaj2005.pdf?sfvrsn=d12c4bb1_4">https://www.aana.com/docs/default-source/wellness-aana.com-web-documents-(all)/alves_occupational_stress_act_aanaj2005.pdf?sfvrsn=d12c4bb1_4</a>	Exploration/expl oratory research	Data obtained via mailed questionnaires with explanatory letter and consent form to 1,124 CRNA is 6 states of New England.  347 (192 responses needed for a well powered study) questionnaires returned with sample representative of New England population of practicing CRNAs	1,124 practicing CRNA members of AANA in 6 New England states r/t increase in ACT practice CRNAS in the region. (sample size of 192 needed for effect size of 0.20 at a power at 0.8)  347 questionnaires were returned, representing a return rate of 30.87%. This was a sufficient response rate to assure sampling effect size and power.	Independent: Scope of practice in Anesthesia Care teams  Dependent: Occupational stress	<b>Collaborative Practice Scale (CPS):</b> measures interaction of CRNA practice process and coordination of anesthesia care via assertiveness and cooperativeness ranging from 19-95. Combinations of these 2 dimensions yield 5 types of conflict behavior: competition (assertive and uncooperative), collaboration (assertive and cooperative), avoidance (unassertive and uncooperative), accommodation (unassertive and cooperative), and compromise (intermediate in cooperativeness and assertiveness).	Descriptive analyses of sample  Reliability testing on scales used in study  Data analysis via correlational analysis, t test, ANOVA	<b>CPS:</b> -Conflict resolution preference: Compromising (intermediate assertiveness and cooperativeness) most common Avoidance mode (low assertiveness and high cooperativeness) next most common. CRNA more likely to use these techniques for conflict resolution -These findings indicated that in most situations, CRNA respondents were more apt to use a compromising or an avoidance approach to conflict resolution, as opposed to collaborating.  <b>SOP:</b> -Higher SOP in hospitals employed CRNAs vs anesthesiology groups.	Descriptive study  LOE: VI	-Appropriate sample size determined by statistical power  -Good review of occupational stress indicators in ACT working CRNAs

		<p>More than 88% respondents report working within ACTs</p> <p>CRNA respondent sample was representative of the New England population of practicing CRNAs and comparable to the national CRNA population.</p> <p>More than 88% of the respondents identified their practice as ACT compared with 73% in the national survey data</p>			<p><b>Scope of Practice (SOP):</b> 41 item Likert scale derived form AANA position statement on anesthesiologist/CRNA collaboration, interaction. Score rance of 41-205 (with 205 being highest scope of practice). Items included all of the preanesthetic assessment, implementing the anesthesia plan, induction, maintenance, and postanesthesia care), along with items pertaining to patient-CRNA interactions. The final component of the SOP tool focused on the individual CRNA's personal performance of various anesthetic techniques (eg, general anesthesia, subarachnoid blocks, and epidural anesthesia).</p> <p><b><u>Occupational Stress Inventory (OSI):</u></b> set of 3 scales that measure stress induced work roles: occupational roles questionnaire (ORQ). psychological strain questionnaire (PSQ), and personal resources questionnaire (PRQ).</p> <p><u>Psychological Strain Questionnaire (PSQ) (CA: 0.930):</u> measure of strain in a person coping with various stressors. Classified into 4 major categories: Vocational Strain, Psychological Strain, Interpersonal Strain, and Physical Strain. The PSQ is based on 10 items in each of the 4 scales, for a total of 40.</p> <p><u>Occupational roles questionnaire (ORQ) (CA: 0.88):</u> measure of occupational stress related to work roles. Total score of 60 *role boundary, a subscale of the ORQ, was the stressor affecting communication the most. According to Osipow, subjects scoring high in the</p>		<p>-Higher SOP in those holding masters degree or higher more likely to be engaged in a broader spectrum of practice in ACTs</p> <p>- low SOP group perceived lower levels of collaboration than those who viewed their SOP as high.</p> <p>-tendency toward higher scores on role insufficiency with lower SOP suggested that CRNA respondents who scored lower in personally perfonning many of the skills and procedures tended to have higher role insufficiency in ACT settings.</p> <p>-ANOVA indicated that low SOP groups perceived lower levels of collaboration (CPS scores) in their ACT</p> <p>- higher SOP groups had higher levels of role overload and increased responsibility-related stress than the lower SOP groups.</p> <p><b>OSI:</b> -higher OSI (Higher role overload and responsibility) scores in higher SOP groups</p> <p>-PSR scores remained high in those with higher SOP scores indicating that coping resources were sufficient despite potential role overload and increased responsibility</p>		
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					role boundary subscale report being unclear about authority lines and having more than one person telling them what to do. This finding applies to nurse anesthesia students when they receive conflicting commands from staff CRNAs, anesthesiologists, surgeons, and didactic faculty members.*  <u>Personal Resources questionnaire (PRQ)</u> (CA: 0.89): measure of coping resources available to an individual. Measured by the following 4 scales: Recreation, Self-Care, Social Support, and Rational/Cognitive Coping. The PRQ is based on 10 items in each of the 4 scales, for a total of 40.				
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Article 3:  Chipas, A., Cordrey, D., Floyd, D., Grubbs, L., Miller, S., & Tyre, B. (2012). Stress: Perceptions, manifestations, and coping mechanisms of student registered nurse anesthetists. <i>AANA Journal</i> , 80(4), 49–55.	Exploratory research	Qualitative, cross-sectional study by surveying SRNAs	1,282 SRNA participants	Independent variables: graduate student status  Dependent variables: self reported stress and negative outcomes	Demographics, associated experience of stress, using 10 point Likert scale, chronic symptoms	Independent t test for response levels in various domains and Pearson correlation coefficient  Internal consistency determined by averages of split-half correlation with resulting Cronbach alpha (R=0.80)	Significant relationships between self-reported stress and negative outcomes (sick days, decreased health and wellness, depression)  SRNAs perceive their stress as above average	Level VI	Limitation: highly subjective, single qualitative study  Strengths: large sample size
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Article 4:  Chipas, A., & McKenna, D. (2011). Stress and Burnout in Nurse Anesthesia. <i>AANA Journal</i> , 79(2), 122–128.	Exploration/expl oratory research	Online multifactorial questionnaire sent to CRNA and SRNAs who had addresses	sent to approximately 28,000 CRNAs and SRNAs who had email	Dependent: Manifestations of stress, including symptoms, life changes in the last year,	10-point Likert scale their level of stress on an average day	Utilized only descriptive statistics	Stress level in CRNA: 4.7 with 48% due to work	Descriptive study  LOE: VI	Weaknesses: utilized only descriptive statistics

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		<p>on file with the AANA undertaken using a survey (www. SurveyMonkey.com)</p> <p>invitation to participate in the survey was distributed by Wanda Wilson, CRNA, PhD, president of the American Association of Nurse Anesthetists (AANA).</p> <p>Data collected between February and May 2008.</p>	<p>addresses on file with the AANA</p> <p>7537 CRNA and SRNA respondents (26.9% of all eligible anesthesia providers)</p> <p>85% CRNAs</p> <p>15% SRNA</p> <p>40% male</p> <p>60% female</p> <p>staff CRNAs, 65%; associate members (students), 14%; administrators, 13%; locum tenens, 6%; and educators, 2%.</p>	<p>self-assessment of stress levels, satisfaction with work and life, stress coping assessment, and, at the request of the AANA Foundation, an assessment of chronic illnesses.</p> <p>Stress levels and physical manifestations in CRNA and SRNA</p> <p>Independent: Demographic questions that included age, gender, employment descriptions, years in anesthesia practice, ethnicity, and marital status</p>			<p>Stress level in SRNA: 7.2 with 67% due to schooling</p> <p>least stressed were the staff nurse anesthetists, who had a mean score of 4.25, with 50% reporting that their main source of stress was their jobs</p> <p>most stressed were the associate members, with a mean stress score of 7.2 and 90% of stress coming from work (school).</p> <p>(83.7%) reported taking 2 or fewer sick days per year. For 41.3%, their last sick day was more than 2 years ago.</p> <p>31% CRNAs have seen mental health practitioner</p> <p>27% SRNAs have seen a mental health practitioner.</p> <p>Most frequent coping mechanism included support/interactions from others</p> <p>18% CRNA taking medication to manage stress</p> <p>19% SRNAs taking medication to manage stress</p> <p>commonly prescribed medications reported include paroxetine (Paxil), fluoxetine (Prozac), sertraline (Zoloft), citalopram (Celexa), escitalopram (Lexapro), buspirone (BusPar), clonazepam (Klonopin), and bupropion (Wellbutrin).</p> <p>Common illnesses reported were GI (35.2%), orthopedic (27.8%), Psychiatric (22.6%), and cardiovascular (19%)</p>		Strengths: large national sample size
<b>Citation</b>  (Author, Year, Title, etc..)	<b>Conceptual Framework</b>  (Theoretical basis for study)	<b>Design/Methods</b>	<b>Sample/Setting</b>  (Number, Characteristics, Exclusions, Criteria, Attrition)	<b>Major Variables; definitions</b>  (Independent variables; Dependent variables)	<b>Outcome Measurement</b>  (What scales used- reliability information- alphas)	<b>Data Analysis</b>  (What stats used?)	<b>Findings</b>  (Statistical finding or qualitative finding)	<b>Level of evidence</b>  Level=	<b>Quality of Evidence</b>  Strength Limits Risks Feasibility

<b>Article 5:</b> Conner, M. (2015). Self-Efficacy, Stress, and Social Support in Retention of Student Registered Nurse Anesthetists. <i>AANA Journal</i> , 83(2), 133–138.	Informative article	Literature review	N/A	N/A	N/A	N/A	Social support can be protective for students experiencing stress  Social support and stress management assistance helps health and coping mechanisms for SRNAs and increases self efficacy (improving academic performance and retention)	Level VII	Strengths: extensive literature review, expert opinion, well-written recommendations for practice  Weaknesses: not a high level of evidence
<b>Citation</b>  (Author, Year, Title, etc..)	<b>Conceptual Framework</b>  (Theoretical basis for study)	<b>Design/Methods</b>	<b>Sample/Setting</b>  (Number, Characteristics, Exclusions, Criteria, Attrition)	<b>Major Variables; definitions</b>  (Independent variables; Dependent variables)	<b>Outcome Measurement</b>  (What scales used- reliability information- alphas)	<b>Data Analysis</b>  (What stats used?)	<b>Findings</b>  (Statistical finding or qualitative finding)	<b>Level of evidence</b>  Level=	<b>Quality of Evidence</b>  Strength Limits Risks Feasibility
<b>Article 6:</b> Eisenach, J. H., Sprung, J., Clark, M. M., Shanafelt, T. D., Johnson, B. D., Kruse, T. N., Chantigian, D. P., Carter, J. R., & Long, T. R. (2015). The psychological and physiological effects of acute occupational stress in new anesthesiology residents. <i>Survey of Anesthesiology</i> , 59(1), 15. <a href="https://doi.org/10.1097/sa.000000000000107">https://doi.org/10.1097/sa.000000000000107</a>	Exploratory research	Eighteen physician interns prior to beginning of anesthesia residency evaluated at three time points (baseline, fist month, and month 3-5)  Validated scales used to measure stress, anxiety, resilience, and wellness at all three points.  Visits 1 and two: resting heart rate variability measured, short term stress markers (hemodynamics, catecholamine levels, cortisol, and interleukin 6) and chronic stress markers (CRP, 24h ambulatory HR/BP, 24h urinary cortisol and catecholamines, overnight HR variability measured)	13 first year anesthesiology residents, seven men and six women.  Age 27-33yo  participants were evaluated during three time conditions: prestress baseline (collected remotely preresidency in June 2013); first-month visit 1, between 5 and 14 working days after starting residency (July 8 to 19, 2013); and follow-up visit 2 (any working day during an operating room or pain service rotation 3 to 5 months after starting residency between September 18 and November 21, 2013).	Independent: Anesthesia residency occupational stress  Dependent: Stress level, physiological stress indicators, effect of stress on well-being activity level, anxiety and resilience levels.	Minnesota Leisure-Time physical activity questionnaire: determine the amount of energy expended during the previous 12 months (appendix 1). The questionnaire recorded information on frequency and duration of activities, providing an estimate of the amount of energy expended per activity, averaged per day in metabolic equivalent  Cohens perceived Stress Scale:a 14-item scale designed to measure the degree to which situations in one’s life are appraised as stressful (appendix 2).11 The Perceived Stress Scale has been shown to be a predictor of psychological symptoms, physical symptoms, and utilization of health services. The mean Cohen’s Perceived Stress Scale score for working adult men and women aged 26 to 35 yrs is 25.0±8.2.12 The mean Cohen’s Perceived Stress Scale scores for college-age men is 22.4± 6.8, and for college-age women is 23.6 ±7.6.13 Cronbach’s alpha coefficient for the internal reliability of the scale is 0.78.14  Spielberger state anxiety index: e for measuring anxiety	Only descriptive statistics were utilized related to the underpowered sample size.	-based on resiliency scores, residents appeared to adapt schedules and health behaviors to better work-life balance.  -Stress level elevated, decreased quality of sleep, energy level, and concentration in first month visit compared to first visit  -Increased serum and salivary cortisol on first visit, no increase on second visit.  -increased serum epinephrine and norepinephrine at first and second visit.	Prospective Cohort Study  LOE:	Weaknesses: -Sample size underpowered for any statistical inferences  -unable to totally isolate independent variable to only occupational stress  Strengths: novel report of occupational stress related to the entrance into the operating environment and could allow for power analysis in future design of trials.

					<p>and has been used in simulated trauma scenarios for resident trainees (appendix 3).<sup>15</sup> It includes 20 questions with a scale (20 to 80 points, higher score indicates higher anxiety) to describe how the respondent feels at a particular moment in time (state anxiety) using subjective feelings of apprehension, tension, nervousness, worry, and activation/ arousal of the autonomic nervous system.<sup>16</sup> In a population of working adults (n = 1,387/451 men/women), the mean Spielberger State Anxiety Index is 35.7±10.4, and in college students (n = 296/481 men/women), the mean is 38.8±12.17 The internal consistency of the state anxiety scale has an alpha of 0.92.<sup>15</sup></p> <p>Resiliency and daily well-being surveys:Two questions provided an abbreviated index of the Connor-Davidson Resilience Scale (appendix 4).<sup>18</sup> The mean Connor-Davidson Resilience Scale score is 6.91±1.5 in a general adult population. Four questions provided a fast and simple assessment of daily well-being as used in employee wellness trials For the stress level (scale 0 to 10), a report at our institution on a cohort of 104 employees undergoing a stress reduction program found a mean stress level of 4.2 ± 2.25 at baseline, and 5.6 ±2.07 after the 12-week program</p> <p>Health behaviors, Chronic stress biomarkers (urine cortisol, epinephrine, norepinephrine, serum c-reactive protein), hemodyanmics and heart rate</p>				
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					variability before during, and after mental stress				
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<b>Article 7:</b> Enns, A., Eldridge, G. D., Montgomery, C., & Gonzalez, V. M. (2018). Perceived stress, coping strategies, and emotional intelligence: A cross-sectional study of university students in helping disciplines. <i>Nurse Education Today</i> , 68, 226-231. <a href="https://doi.org/10.1016/j.nedt.2018.06.012">https://doi.org/10.1016/j.nedt.2018.06.012</a>	Exploratory research	Cross-sectional online survey design; participants recruited via online resources	203 undergraduate and graduate students majoring in psychology, nursing and social work	Independent variables: demographic characteristics, graduate student status  Dependent variables: perceived stress and coping ability	Perceived Stress Scale, Brief COPE, and Schutte Self-Report Emotional Intelligence Test (SSEIT)	SPSS used to analyze mediation effects of coping on the relationship between EI and perceived stress (bias-corrected bootstrapping multiple mediation approach using 95% confidence interval)	Higher EI was associated with lower perceived stress and is partially mediated by adaptive coping  Interventions aimed at increasing EI may help reduce perceived stress for students in helping disciplines	Level VI	Limitations: self-reported data (susceptible to error); cross-sectional design does not allow causal relationships to be determined
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<b>Article 8:</b> Hoying, J., Melnyk, B., Hutson, E., & Tan, A. (2020). Prevalence and correlates of depression, anxiety, stress, healthy beliefs, and lifestyle behaviors in first-year graduate health sciences students. <i>Worldviews on Evidence-Based Nursing</i> , 17(1), 49–59. <a href="https://doi.org/10.1111/wvn.12415">https://doi.org/10.1111/wvn.12415</a>	Exploratory research	Cross-sectional descriptive correlational study to collect baseline data from first year graduate health sciences students	197 first-year graduate students from seven health sciences colleges within a large, land-grant university in the Midwest	Independent variables: sleep, general health, perceived amount of control  Dependent variables: depression, anxiety, physical health, lifestyle beliefs and behaviors	Personal wellness assessment (PWA) consisting of Healthy Lifestyle Beliefs Scale (HLBS), Healthy Lifestyle Behaviors Scale (HLBHS), Brief Inventory of Perceived Stress, Patient Health Questionnaire 9 (PHQ-9), General Anxiety Disorder Scale (GAD-7) basic demographic information	Descriptive statistics to summarize sample characteristics; Pearson correlation coefficient to examine correlation among measures of healthy lifestyle beliefs, behaviors, stress, depression, and anxiety; Bivariate tests (t test, ANOVA, Chi-square) to examine unadjusted associations with having depression and anxiety; multiple logistic regression models to identify significant predictors of depression and anxiety; two-sided significance level of 0.05	17% of incoming students reported depressive symptoms, with 6% reporting suicidal ideation; 14% reported moderate-to-severe anxiety  Factors that predicted depression and anxiety: <7 hours of sleep, worse general health, poor healthy lifestyle habits, perceived lack of control	Level VI	Weakness: small group size that may not be generalizable to a larger population

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<b>Article 9:</b> Jeong, Y., & Koh, C. (2021). Female nursing graduate students' stress and health: The mediating effects of sense of coherence and social support. <i>BMC Nursing, 20</i> (1). <a href="https://doi.org/10.1186/s12912-021-00562-x">https://doi.org/10.1186/s12912-021-00562-x</a>	Exploration/exploratory research	-data collected on 231 female nursing graduate students from 14 universities via online survey august 2019-october 2019	231 South-Korean female graduate nursing students.  Mean age of 32yo  -56% single  68% in masters program  72% part-time students  -70% fulltime workers  Mean clinical experience 8.22 years	Independent: perceived stress, social support, sense of coherence  Dependent: health status	<b>Perceived stress:</b> measured with a seven-item instrument developed specifically for this study based on previous studies focusing on graduate students' stress experience The seven items assessed stressors commonly reported by graduate students in field-relevant literature, including "class requirements (e.g., presentations, examinations, and assignments)," "research/thesis writing," "relationship with professors," "career uncertainty after obtaining degree," "scheduling conflicts/time shortage," "financial problems," and "balancing family, social, work, and academic responsibilities." (CA: 0.7) Participants were tasked to read each item and answer how often they experienced stress due to each aspect during their graduate program; all items were scored on a 5-point Likert scale (0 = "never," 1 = "rarely," 2 = "sometimes," 3 = "often," 4 = "always"). Higher mean scores indicated a higher level of perceived stress  <b>Multidimensional Scale of perceived social support (MSPSS:</b> -cronbachs of 0.94 instrument consists of 12 items, each scored on a Likert	Descriptive statistics to present student characteristics  Bivariate correlations used to examine associations among variables  Pearson's correlation coefficients to determine association b/w study variables	Mean perceived stress score 2.21/  Mean SOC-13 of 57.05  Mean MSPSS score of 2.21  Mean health status score of 65.65  Age had positive correlation with perceived stress and SOC  Marital status is positively associated with perceived stress, social support, and SOC.  Enrollment program positively associated with perceived stress and negatively associated with health status  Perceived stress had negative direct effects on social support  social support had a positive direct effect on SOC  Health status negatively correlated with perceived stress, and positively correlated with SOC and social support  . Moreover, SOC (path b2: B = 0.59, SE = 0.09, p < .001) had significant direct effects on health status, whereas perceived stress (path c': B= - 7.07, SE = 1.52, p < .001) had a negative direct effect on health status. However, social support (path b1: B = 1.24, SE = 1.03, p = .232) was not a significant predictor of health status (  SOC had negative correlation with perceived stress, and positive with social support.	Descriptive Cross-sectional study  LOE: VI	Strengths: deepens understanding of stress and health of female nursing graduate students  Weaknesses: small samples size located in small subset of graduate schools



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					<p>scale ranging from 1 (“very strongly disagree”) to 7 (“very strongly agree”).</p> <p>includes three subscales: significant other, family, and friends.</p> <p>Higher mean scores indicate a higher level of social support</p> <p><b>Antonovsky’s Sense of coherence (SOC-13):</b> -cronbachs of 0.84</p> <p>instrument consists of 13 items on a 7-point Likert scale.</p> <p>consists of three subscales: comprehensibility (5 items), manageability (4 items), and meaningfulness (4 items).</p> <p>total score is the sum of the 13 items and ranges from 13 to 91. A high total score indicates a strong SOC</p> <p><b>Health status measured by 36-Item Health survey developed by RAND corporation:</b></p> <p>- cronbachs 0.62</p> <p>36-Item Health Survey evaluates eight health concepts: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions</p> <p>The scores for the eight subscales ranged from 0 to 100, with a higher score indicating better health status</p>		Social support negatively associated with perceived stress		
Citation	Conceptual Framework	Design/Methods	Sample/Setting	Major Variables; definitions	Outcome Measurement	Data Analysis	Findings	Level of evidence	Quality of Evidence

(Author, Year, Title, etc..)	(Theoretical basis for study)		(Number, Characteristics, Exclusions, Criteria, Attrition)	(Independent variables; Dependent variables)	(What scales used- reliability information- alphas)	(What stats used?)	(Statistical finding or qualitative finding)	Level=	Strength Limits Risks Feasibility
<p><b>Article 10:</b></p> <p>Mesisca, M., &amp; Mainwaring, J. (2021, October). <i>Stress, anxiety, and well-being in nurse anesthesia doctoral students</i>. Stress, Anxiety, and Well-being in Nurse Anesthesia Doctoral Students. Retrieved December 5, 2021, from <a href="http://www.onlinedigeditions.com/publication/?i=723084&amp;article_id=4124326&amp;view=articleBrowser&amp;ver=html5">http://www.onlinedigeditions.com/publication/?i=723084&amp;article_id=4124326&amp;view=articleBrowser&amp;ver=html5</a>.</p>	Exploratory research	<p>-electronic surveys were distributed to a convenience sample of SRNAs.</p> <p>-electronic surveys were distributed to a convenience sample of SRNAs. The chosen population included all SRNAs (N=76) currently enrolled in a doctoral</p> <p>-Data were collected and dispersed via an online survey software program</p>	<p>-The chosen population included all SRNAs (N=76) currently enrolled in a doctoral program at a small urban university campus.</p> <p>-years of SRNAs: students in year 3 (n=24), year 2 (n=15), and year 1 (n=25). The third-year students were enrolled in full-time clinical and specialty clinical rotations, doctoral coursework, and nurse anesthesia board review courses. Second-year students were enrolled in full-time clinical rotations (4 days per week), didactic doctoral courses, and anesthesia courses. First-year students were enrolled in full-time nurse anesthesia courses and didactic doctoral coursework, preparing for entry into the clinical Setting</p> <p>-SRNAs not enrolled full-time or who were lost due to attrition were excluded</p> <p><b>-64 respondents for this survey, with an overall response rate of 84.2%. Most participants reported being 25 to</b></p>	<p>Dependent: Clinical hour requirements, Doctoral coursework, personal stressors.</p> <p>Independent: Stress levels, anxiety levels, well-being</p>	<p>-Perceived Stress Scale-10 (PSS-10): high score on the PSS-10 indicated higher levels of perceived stress. Cronbach <math>\alpha</math> of the PSS-10 was above 0.70 among student populations.</p> <p>Penn State Worry Questionnaire (PSWQ): high score on the PSWQ demonstrated higher levels of worry (a well-demonstrated construct of anxiety). mean Cronbach <math>\alpha</math> of 0.89, ranging between 0.60 and 0.99 in student and nonstudent populations</p> <p>Medical Student Well-Being Index (MSWBI): MSWBI can be used to identify individuals with distress (low well-being) and those who are thriving (high well-being). A high score on the MSWBI indicated poor well-being with a greater risk of personal or professional compromise, whereas a low score indicated higher levels of well-being or thriving. Cronbach <math>\alpha</math> for the MSWBI has ranged between 0.69 and 0.78 in medical students</p> <p>Supplementary questions for clinical performance, academic performance, student's perceptions of preceptor support, and other open-ended questions for students to express beliefs, perceptions,</p>	<p>-Inferential statistics was used to evaluate the strength and nature of relationships using Spearman <math>\rho</math> correlation of stress, anxiety, and well-being in SRNAs enrolled in a doctoral program (P value less than .05 determined significance). Spearman <math>\rho</math>, a nonparametric correlation test, was used because of a skewed distribution of variables, which violates assumptions for parametric testing. Descriptive statistics of frequency and percentage were used to describe demographic data</p> <p>-For qualitative data from open-ended questions, thematic analysis was used to identify, analyze, organize, and describe themes regarding students' perceptions of stress, anxiety, and well-being and students' suggestions for improvement. Analytic steps for thematic analysis included becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining themes, and a write-up. For this study, open coding was used, meaning there were no</p>	<p>-Significant positive correlations were found between the MSWBI and PSWQ (<math>p=.294</math>, <math>P=.02</math>), PSS (<math>p=.413</math>, <math>P=.001</math>), and academic performance (<math>p=.370</math>, <math>P=.003</math>), but not clinical performance (<math>p=.181</math>, <math>P=.27</math>). indicate that as scores of low well-being increase, so do scores of anxiety and stress</p> <p>-as MSWBI scores increased, respondents reported a perceived impact on their academic performance</p> <p>PSWQ: the mean score was 44.47 (SD=3.651) with a minimum score of 37 and a maximum score of 53 for a range score of 16 points</p> <p>PSS-10: mean score was 18.27 (SD=3.453) with a minimum score of 9 and a maximum score of 25 for a range score of 16 points</p> <p>-Differences between the SRNA cohorts, on the combined dependent variables (PSWQ, PSS-10, and MSWBI), were not significant</p> <p>-The MSWBI revealed a mean score of 4.08 (SD=1.572). Most respondents (67%) scored equal to or above 4, indicating low well-being and presenting a high risk of adverse outcomes. The scores above or equal to 4 corresponded with a higher risk of the following adverse consequences: poor mental quality of life, suicidal ideation, burnout, severe fatigue, and risk of dropping out</p> <p>-When asked about perceptions of student well-being, 50% of SRNAs (n=32) believed that their preceptors and clinical faculty did</p>	VI: Cross-sectional mixed methods	<p>Strengths: a study that is similar to exactly what we want to implement</p> <p>Weaknesses: no recommendations for wellness promotion based on study results.</p>

			29 years of age, female, White, and in program year 1 or year 3 and having worked 2 to 3 years in ICU before entering school		and suggestions	<p>preset codes for data, as themes were deducted from student responses</p> <p>--1-way multivariate analysis of variance was run to determine the effect of student's year in schooling on the PSWQ, PSS-10 and MSWBI.</p>	<p>not acknowledge student well-being. (Of the SRNAs enrolled in clinical practice who responded to the survey, 82% thought their well-being was not acknowledged by preceptors and/or clinical faculty)</p> <p>-Greater than 60% of respondents (n=39) expressed they would benefit from either online or in-person well-being workshops to learn stress reduction strategies</p> <p>Participant descriptions from open-ended questions clustered around 4 main themes: (1) negative personal and emotional impacts. (2) doctoral education impacts and needed changes. (3) disconnect of clinical preceptor understanding or supporting doctor of nursing practice (DNP) course load. (4) suggestions to improve SRNAs' well-being during doctoral education</p>		
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 11:</b>  <b>Rizzolo, D., &amp; Massey, S. (2020). Fluctuations in stress over time during the first year of health science programs. <i>Journal of Allied Health, 49</i>(2), 120–124.</b>	Exploratory research	Students completed surveys during the first week of grad school, last 2 weeks of semester, and mid-semester for semester 2	Total of 79 students enrolled in four graduate health science programs at Misericordia University	<p>Independent variable: timing of semester</p> <p>Dependent variables: levels of anxiety, depression, OCD phobia, somatization</p>	Brief Symptom Inventory (BSI) including subscales for anxiety, depression, OCD, phobia, somatization	Data entered into SPSS and descriptive statistics with repeated t-tests with Bonferroni post hoc test to analyze data; scores reported as total means	Pressure/stress of school has association with fluctuations in fluctuation in anxiety and depression	Level VI	Weaknesses: small sample size that may not be generalizable to larger population; more study needed on stress management strategies
*****Stress and Clinical/Academic Performance*****									

Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 12:</b> Bittering, A. C. (2020). Relationship Between Emotional Intelligence and Occupational Stress Levels Among Certified Registered Nurse Anesthetists. <i>AANA Journal</i> , 88(5), 398–404.	Exploration/expl oratory research	After a literature review exploring effects of stress on practitioner health and performance  Convenience sample of 2,071 CRNA with an active email address in the Michigan association of nurse anesthetists was recruited.  Electronic survey sent measuring emotional intelligence level and workplace stress level.  Data analyzed	295 CRNAs in state of Michigan  68% female  16% between ages of 51-55yo  28% practicing for >25 yrs  Exclusion: unemployment and/or practicing less than 1 year	Independent: Emotional intelligence level, patient care, workload, operating room environment, and interactions with operating room personnel  Dependent: workplace stress level	<b>Emotional Intelligence Scale (0.89):</b> -33-item scale created to be a theoretically cohesive and comprehensive shorter version of the original Salovey and Mayer measuement tool -reflect a conceptualization of EI that can then be categorized into 4 subscales: (1) perception of emotions, (2) management of own emotions, (3) management of others’ emotions, and (4) utilization of emotions -scored on a 5-point Likert scale with 1 = strongly disagree and 5 = strongly agree -Higher scores on this scale reflect higher levels of EI  <b>Workplace stress survey (CA: 0.66)</b> -10-question survey uses a sliding 10-point Likert scale in which 1 to 4 = strongly disagree, 5 to 7 = agree somewhat, and 8 to 10 = strongly agree -Scores ranging between 10 and 30 indicate one handles stress well on the job, between 40 to 60 indicates one handles on-the-job stress moderately well, and 70 to 100 indicates one is having problems in need of resolution	Bivariate correlations computed b/w EI and workplace stress survey  Post hoc independent samples t test to differentiate between female and male EI levels	total mean score on the Emotional Intelligence Scale was 125.79 (SD = 11.55, range = 33-165), suggesting a moderately high level of EI  Workplace stress 42.48 (out of 100)  A significant inverse correlation was found between the total scores of the Emotional Intelligence Scale and the total scores of the Workplace Stress Survey (r = –0.20, P < 0.01), indicating that CRNAs who scored higher levels of EI reported lower levels of workplace stress  Two subscales of the Emotional Intelligence Scale were also found to have significant inverse correlation: Managing Others’ Emotions (r = –0.18, P < .01) and Managing Own Emotions (r = –0.29, P < .01)  t female CRNAs scored significantly higher EI levels (mean = 127.55, SD = 10.98) than males (mean = 122.14, SD = 12.16; t (df = 254) = –3.52; P < .05).	Descriptive Cross-sectional study  LOE: VI	Strengths:relates benefit of EI to both the personal life of CRNA and to benefiting practice  Weaknesses: smaller sample size from only one state in US
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility

<b>Article 13:</b> Dosch, M. P., Jarvis, S., & Schlosser, K. (2008). Attrition in Nurse Anesthesia Educational Programs as Reported by Program Directors: The Class of 2005. <i>AANA Journal</i> , 76(4), 277–281.	Exploratory research	20 item survey sent to anesthesia program directors, which remained open for one month	Survey was sent to 101 program directors  Excluded 8 programs as they were not open in 2005  62 responded, 2 declined, 29 did not respond	Independent variables: program director experience, program length, program size  Dependent variable: attrition rate	N/A	Descriptive statistics to summarize the data  Pearson’s correlation coefficient to measure degree of association among program attrition rate, program director experience, program size, program length  X2 test to determine association between program size and attrition rate  SPSS 14.0 and Excel programs to aid in computation and create figures  2 tailed P value less than 0.05 accepted as statistical significance	9% attrition rate for nurse anesthesia cohort of 2005  Most common reasons for attrition was withdrawal, followed by academic dismissal, then clinical dismissal  Attrition rate for programs was not related to length of experience of program director or to the size of program	Level IV	Strengths: high response rate (83%), sound statistical analysis  Weakness: view from program directors only, not students (limits generalizability)
<b>Citation</b>  (Author, Year, Title, etc..)	<b>Conceptual Framework</b>  (Theoretical basis for study)	<b>Design/Methods</b>	<b>Sample/Setting</b>  (Number, Characteristics, Exclusions, Criteria, Attrition)	<b>Major Variables; definitions</b>  (Independent variables; Dependent variables)	<b>Outcome Measurement</b>  (What scales used- reliability information- alphas)	<b>Data Analysis</b>  (What stats used?)	<b>Findings</b>  (Statistical finding or qualitative finding)	<b>Level of evidence</b>  Level=	<b>Quality of Evidence</b>  Strength Limits Risks Feasibility
<b>Article 14:</b>  Griffin, A., Yancey, V., & Dudley, M. (2017). Wellness and thriving in a student registered nurse anesthetist population. <i>AANA Journal</i> , 85(5), 325–330.	Exploratory research	Students evaluated with SWPS and PSE during class time at different intervals throughout curriculum, GPA and SEE scores monitored throughout, patient perception evaluated on same- day endoscopy procedures	3 cohorts of 75 total students pursuing master’s degree in nurse anesthesia in a Midwestern university over 16 months	Independent variables: gender, age, marital status, nursing experience  Dependent variables: wellness domain scores	Salutogenic Wellness Promotion scale (SWPS) to measure perceived wellness, Perceived Self-Efficacy Scale (PSE) to measure perceived self-efficacy, GPA and SEE scores, grade averages, Caring Behaviors Inventory Scale and Client Perception of Caring Scale to measure patient satisfaction	Multiple regression analysis, P <0.5	Positive relationship between students’ overall perceived wellness, emotional wellness and perceived self-efficacy  Negative correlation between SEE scores and wellness	Level VI	Limitations: correlational data (not cause and effect), small homogeneous group (limited generalizability), minimal variance between academic achievement, clinical competence, patient satisfaction  Strengths: one of the first studies of its kind evaluating student wellness in anesthesia



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<b>Article 15:</b> Kendrick, P. (2000). Comparing effects of stress and relationship style on student and practicing nurse anesthetists. <i>AANA Journal</i> , 68(2).	Descriptive correlational study	-Survey methodology using instruments to measure subject stress, style of relating to others, and communication style  -Assessment administered to students in classroom setting and to CRNAs via packet to be returned in 1 week	-Sample consisted of 81 participants divided into 4 groups  -66 SRNAs divided into 3 groups based on years in training  -1 group of 15 practicing CRNA	Independent: years in training, amount of debt, age, gender, relationship status, number of dependents  Dependent: stress levels, ability to communicate effectively	-Stress levels measured by OSI <b>-OSI: measure of 3 dimensions of occupational adjustment:</b> occupational stress (Role overload, role insufficiency, role ambiguity, role boundary, responsibility, physical environment), psychological strain (personal strain questionnaire: vocational strain, psychological strain, interpersonal strain, physical strain), coping resources (Personal resources questionnaire: Recreation, self-care, social support, rational/cognitive coping) -Style of relating to others measured by SDI  <b>-Strength deployment inventory (SDI)</b>  <b>-Ability to Communicate effectively measured by ICI</b> <b>-interpersonal communication Inventory (ICI)</b>	OSI: analysis of variance, Probability plot of residuals, test of variance (all assumptions met for all statistics). Post-hoc testing (2 <sup>nd</sup> year SRNAs statistically different)  Pvalue <0.05 considered significant	-Highest stress level among 2 <sup>nd</sup> year SRNAs who also had lowest ICI (communication) scores  -Lowest ICI scored by altruistic/nurturing personality type.  -When situations not going well, personality type shifted to automizing/analytic type.	Descriptive correlational study LOE: VI	Weaknesses: small sample size  CRNA responses taken home and completed over 1wk  Strengths: tested many correlating factors related to stress and occupational/academic performance  Repeatable study
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 16:</b> McKay, K., Buen, J., Bohan, K., & Maye, J. (2010). Determining the Relationship of Acute Stress, Anxiety, and Salivary a-Amylase Level With Performance of Student Nurse Anesthetists During Human-Based Anesthesia Simulator Training. <i>AANA Journal</i> , 78(4).	Exploration/exploratory research	-Subjects filled out STAI Y1 and Y2 forms to score anxiety trait, HR, BP, pulse ox, presence/absence of sweat noted, saliva sample obtained.  - student performed a high fidelity simulation of a standard	-18 military and federal health students enrolled in the NA program at the Uniformed Services University class of 2009.  Exclusions: students with gingival bleeding tendencies or taking medication with adrenergic	Dependent: Salivary alpha-amylase, HR, anxiety levels, STAI Y1 anxiety level measurement	‘objective performance check list’  HR, BP, pulse ox measurements  Salivary alpha amylase measurements  STAI Y1 anxiety level measurements	Analysis of variance to compare performance scores with salivary alpha-amylase, HR, anxiety level among 3 groups	68.8% increase in salivary amylase from presimulation values  14% increase in HR  28% increase in anxiety levels  Low-performance group: 119% increase in salivary alpha amylase  Moderate performer: 0.6% increase in alpha amylase	LOE: III Quasi-experimental study	Strengths: dependent variables based on wide range of objective measurements  Weaknesses: small sample size especially for comparing b/w performance groups  Objective checklist needs further

		induction sequence.  -HR, BP, presence of sweat, saliva sample collect directly after.  -STAI Y1 filled out by student  -Student relaxed for 20 min. Measurement 3 and STAI Y1 collected  -performance scores based on an objective checklist done by 3 CRNAS independently  -Subjects divided into 3 groups of 6 based on performance	agonist/antagonist properties				High performer: 114% increase in alpha amylase (not statistically significant)		investigation regrading validity and reliability
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 17:</b> Pitt, V., Powis, D., Levett-Jones, T., & Hunter, S. (2012). Factors influencing nursing students' academic and clinical performance and attrition: An integrative literature review. <i>Nurse Education Today, 32</i> (8), 903–913. <a href="https://doi.org/10.1016/j.nedt.2012.04.011">https://doi.org/10.1016/j.nedt.2012.04.011</a>	Exploration/expl oratory research	Review based on Whittemore and Knafls framework to include large number of qualitative and quantitative variables  -44 papers: 2 qualitative, one mixed used.  Factors that reported a significant impact on academic performance, clinical performance, and attrition grouped into: demographic,	Studies published from 1999 to 2011 searched in Medline, cinahl, proquest nursing, proquest education, ERIC, OVID, psych INFO, and scienceDirect  -Search categories: nursing student, academic performance, clinical performance, attrition.  Inclusion: undergrad preregistration nursing students, university or college program, qualitative	Dependent: Academic performance Clinical performance Attrition  Independent: demographic, academic, cognitive, and personality/behavior	Critical Thinking process Test (CTPT)	Pvalue <0.05 considered significant	<b>demographics</b> <b>Age:</b> -older students have better academic performance than younger students  -Higher attrition rates in younger students  <b>Gender:</b> higher attrition rates for male students  <b>Ethnicity:</b> English as a second language students with lower academic performance  <b>Employment status:</b> students working more than 16h/wk had poorer academic performance  <b>Academic factors</b> <b>Admission qualifications:</b> correlation b/w performances in	LOE: I  Meta-analysis	Weaknesses: Studies selected lack of consistency in defining the age of older student  Sample heterogeny: Studies dominated by younger female subjects

		academic, cognitive, and personality/behavior	and quantitative research papers  Exclusion: upper division programs, LPN programs, descriptive papers, discussion papers, dissertations				science based prerequisite courses and nursing program performance and NCLEX pass rates  <b>First semester GPA:</b> higher rate of success in licensing readiness exam and third year e performance  Higher Pathophys course performance predictor of lower attrition rate and performance in second year of program  nursing course performance positively correlated with NCLEX success rate  <b>Exit exams:</b> positively correlated with NCLEX pass rate  <b>Cognitive Factors</b> <b>Critical thinking:</b> positive correlation b/w critical thinking scores and NCLEX pass rate/GPA  Negative correlation with attrition  <b>Personality and Behavior Factors</b> <b>Personality:</b> students with a perceived external locus of control had lower first year grades  Higher extraversion score had lower academic performance  Higher psychoticism personality score with higher attrition  <b>Anxiety:</b> students with higher levels of anxiety made more errors in simulation (small sample size)  <b>Self: efficacy:</b> higher mathematics self-efficacy directly related to better performance in math assessment.  Higher occupational self-efficacy with better overall program performance  <b>Support seeking:</b> students with more social support had better overall GPA		
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							Higher perception of faculty/psychological/functional support had lower attrition rates  <b>Academic engagement:</b> negative correlation b/w non-attendance and academic performance		
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<b>Article 18:</b> Ringeisen, T., Lichtenfeld, S., Becker, S., & Minkley, N. (2018). Stress experience and performance during an oral exam: The role of self-efficacy, threat appraisals, anxiety, and cortisol. <i>Anxiety, Stress, &amp; Coping, 32(1)</i> , 50–66. <a href="https://doi.org/10.1080/10615806.2018.1528528">https://doi.org/10.1080/10615806.2018.1528528</a>	Exploration/expl oratory research	Baseline medical information obtained one week before exam  3 measurement points on exam day (30 min prior to exam, directly after exam, before announcement of grade, 30 min after grade announcement	92 students (46 women) b/w ages of 20 and 36 in Germany.	Dependent: anxiety level, cortisol concentrations, received grade  Independent: Academic self-efficacy, Threat appraisal score	Academic Self-efficacy scale (CA of 0.68)  Threat appraisal scale (CA of 0.82)  State anxiety adjective-based instrument (CA ranging from 0.79, to 0.82)	ANCOVA	Pre exam anxiety and cortisol decreased until grades were announced  Higher cortisol levels r/t to steeper decline  Changes in anxiety and cortisol levels unrelated  Self-efficacy negatively related to threat appraisals and anxiety on control day  Greater threat appraises positively correlated to higher preexam anxiety, and steeper anxiety decrease on exam day	Descriptive Cross-sectional study  LOE: VI	Strengths: intraindividual control design to account for baseline anxiety and cortisol levels  Weaknesses: small sample size. No control on when students woke during test day could affect cortisol levels,
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 19:</b> SHENAAR-GOLAN, V., WALTER, O., GREENBERG, Z., & ZIBENBERG, A. (2020). Emotional Intelligence in Higher Education: Exploring Its Effects on Academic Self-Efficacy and Coping with Stress. <i>College Student Journal, 54(4)</i> , 443–459.	Exploration/expl oratory research	Marathon program aimed at developing students’ self-efficacy through total of 12 hours of courses divided in 2-3hr sessions conducted in a group of 8-10 students led by professional academic success practitioners and successful students.	215 students who took part in the Marathon Program (program focused on academic and emotional support)  -74% female -57.7% science department students 42.3% department of humanities and social sciences students	Independent: Marathon program  Dependent: Student grades, Emotional Intelligence, academic self-efficacy	-Academic self-efficacy questionnaire 92% reliability rate (cronbachs alpha of 0.9)  -Self report emotional intelligence test (SREIT) (Cronbachs of 0.9)  -Stress appraisal and coping questionnaire (cronbachs of 0.69 for coping strategies in general and 0.60 for avoidance coping strategies)	Cronbachs alpha for test reliability  -t test to test differences b/w differed research variables at two points in time  -ANOVA for differences in coping strategies between students in differed stages of studies  -Regression analysis with academic self	GPA: no statistical difference  -Higher levels EI more likely to present a greater sense of academic self-efficacy  -first year students more likely to employ avoidance coping strategies	LOE: IV Cohort study	Weaknesses: average grade of participants compared to general student body, and not non participants.  Cronbach of .6 for stress appraisal and coping questionnaire

						efficacy as dependent variable			
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<b>Article 20:</b> Wu, H., Li, S., Zheng, J., & Guo, J. (2020). Medical students’ motivation and academic performance: The mediating roles of self-efficacy and learning engagement. <i>Medical Education Online, 25</i> (1), 1742964. <a href="https://doi.org/10.1080/10872981.2020.1742964">https://doi.org/10.1080/10872981.2020.1742964</a>	Exploration/exploratory research	<p>- Anonymous survey completed during May and June 2014.</p> <p>-data from 1,930 medical students in China. regarding relations between studying variables</p> <p>-structural equation model (SEM) analysis to examine the mediating roles of self-efficacy and learning engagement on the relationship between motivation and academic performance.</p> <p>-multiple-group SEM analyses to compare differences between males and females, and between students in key universities and colleges</p> <p>-Academic performance provided by universities</p>	<p>-stratified sampling method to select a total of 1,930 medical students from 10 universities in years 1-4 of medical school.</p> <p>-29% male 70% female</p> <p>37% from key universities and colleges</p>	<p>Independent: Demographics, academic engagement, Self-efficacy,</p> <p>Dependent: motivation, academic performance</p>	<p>Enrollment Motivation scale (CA 0.72)</p> <p>Self-efficacy scale (CA 0.84)</p> <p>Learning Engagement Scale (CA 0.86)</p>	<p>Multivariate regression to determine effect of demographics on/external environments affect motivation and extrinsic motivation</p> <p>Unpaired t-tests to compare students intrinsic/extrinsic motivation, self efficacy, learning engagement, and academic performance</p> <p>Pearson correlation to compare relationship between study variables</p>	<p>-multivariate regression showed that Key university positively correlated to intrinsic motivation and negatively correlated to extrinsic motivation</p> <p>-unpaired t-test showed male students had higher internal motivation but lower academic performance</p> <p>Internal motivation positively correlated with self-efficacy and learning engagement, but not academic performance.</p> <p>Self-efficacy and learning engagement significant positive correlation with academic performance</p>	<p>Descriptive Cross-sectional study</p> <p>LOE: VI</p>	<p>Strengths: large sample size,</p> <p>Weaknesses: abundant self-reported information</p>

*****Wellness Promotion*****									
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<b>Article 21:</b> Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: Care of the patient requires care of the provider. <i>Annals of Family Medicine</i> , 12(6), 573–576. <a href="https://doi.org/10.1370/afm.1713">https://doi.org/10.1370/afm.1713</a>	Exploration/expl oratory research	N/A (Informative article/literature review)	N/A	N/A	N/A	N/A	The Triple Aim of healthcare (reducing costs, improving patient experience, and improving population health) does not address provider health and wellness. Physicians and other healthcare team members report significant burnout which may affect patient outcomes. The authors suggest a fourth aim: improving the work life of those who deliver care.	Level VII	Strengths: background information obtained from credible resources, useful recommendations made for addressing fourth aim.  Weaknesses: expert opinion, not a high level of evidence.
<b>Article 22:</b> Gutman, S. A., Sliwinski, M., Laird, J., & Nguyen, J. (2020). Effectiveness of a multimodal mindfulness program for student health care professionals: A randomized controlled trial. <i>The Open Journal of Occupational Therapy</i> , 8(2), 1–18. <a href="https://doi.org/10.15453/2168-6408.1662">https://doi.org/10.15453/2168-6408.1662</a>	Exploration/expl oratory research	-36 participants randomly assigned to intervention or control group  -eight week mindfulness program consisting of weekly 40min in person group sessions and four weekly 10 min online guided meditations.  -Pre and post perceived stress scale, student stress management scale, mindfulness activity log, open-ended qualitative questionnaire, GPA, and counseling visit frequency measured	-40 occupation and physical therapy students  Exclusion criteria: students who were practiced mediators or had prior experience with mindfulness training	Independent variables: 8 week mindfulness program  Dependent variables: GPA, Stress level, number of counseling sessions attended	Perceived Stress Scale (PSS)  Student Stress Management Scale (SSMS)  Mindfulness activity logs  Open-ended qualitative questionnaire	Mann Witney U test to determine statistical significance of PSS and SSMS  Wilcoxon singed rank test to determine statistically significant in mindfulness log activity ratings  Independent t-test to determine statistical significance in GPA  Chi Square to analyze number of counseling visits	PSS: non statistically significant difference at baseline, post-intervention statistically significant lower score in intervention group  SSMS: postintervention statistically significant lower scores  Mindfulness log ratings: statistically significant difference in participant pre and post activity ratings  GPA/counseling visits: no statistically significant difference	RCT: Level II	Strengths: comprehensive wellness program effects thoroughly evaluated  Weakness: small sample, study underpowered.  Decrease in log submissions as study progressed.  Only occupational and physical therapist students enrolled in study
Citation  (Author, Year, Title, etc...)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used-reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of Evidence  Level =	Quality of Evidence  Strengths, Limits, Risks, Feasibility

<b>Article 23:</b>  <b>Rith-Najarian, L. R., Boustani, M. M., &amp; Chorpita, B. F. (2019). A systematic review of prevention programs targeting depression, anxiety, and stress in university students. <i>Journal of Affective Disorders</i>, 257, 568–584.</b> <a href="https://doi.org/10.1016/j.jad.2019.06.035">https://doi.org/10.1016/j.jad.2019.06.035</a>	Exploratory research	Systematic review of effective prevention programs targeting depression, anxiety, and stress in university students	62 articles that covered 68 prevention programs for college, graduate, professional students across 15 countries  Inclusion criteria: primary intervention, post-secondary students, designed to primarily target anxiety and stress, total sample of 30 or more, and published in peer-review journal	Independent variables: stress intervention programs  Dependent variables: stress, anxiety, depression levels	No one single scale used-evaluating subjective improvements in stress, anxiety, depression symptoms after interventional programs	Inter-rater reliability calculated with Cohen’s kappa statistic; reliability statistics based on coder’s data collection prior to resolving discrepancies	Prevention programs had common practice elements and produced moderate reduction in symptoms	Level I	Some elements were coded with moderate inner-reliability; could not run meta-regression with all elements; binary coding may not capture how extensively an element was covered
<b>Citation</b>  (Author, Year, Title, etc...)	<b>Conceptual Framework</b>  (Theoretical basis for study)	<b>Design/Methods</b>	<b>Sample/Setting</b>  (Number, Characteristics, Exclusions, Criteria, Attrition)	<b>Major Variables; definitions</b>  (Independent variables; Dependent variables)	<b>Outcome Measurement</b>  (What scales used-reliability information- alphas)	<b>Data Analysis</b>  (What stats used?)	<b>Findings</b>  (Statistical finding or qualitative finding)	<b>Level of Evidence</b>  Level =	<b>Quality of Evidence</b>  Strengths, Limits, Risks, Feasibility
<b>Article 24:</b>  Sharp, M., & Burkart, K. M. (2017). Trainee wellness: Why it matters, and how to promote it. <i>Annals of the American Thoracic Society</i> , 14(4), 505–512. <a href="https://doiorg.libproxy2.usc.edu/10.1513/AnnalsATS.201612-1006PS">https://doiorg.libproxy2.usc.edu/10.1513/AnnalsATS.201612-1006PS</a>	Informative	Literature review	N/A	N/A	N/A	N/A	“Strategies of preventive medicine should be applied to promote wellness among physicians and trainees”  Strategies to promote wellness are financially beneficial to companies.  “Individual-focused, organizational, and structural strategies to address burnout were shown to significantly reduce overall burnout, emotional exhaustion, and depersonalization”  Leadership is essential to prevent burnout  coaching, mentorship, mindfulness, improving self-compassion, and communication skills are effective individual focused coping strategies  Wellness initiatives can improve quality of life  An essential component of improving wellness is an organizational wellness committee	Level VII	Strengths: Expert opinion with several credible resources in literature review, including systematic reviews
<b>Citation</b>	<b>Conceptual Framework</b>	<b>Design/Methods</b>	<b>Sample/Setting</b>	<b>Major Variables; definitions</b>	<b>Outcome Measurement</b>	<b>Data Analysis</b>	<b>Findings</b>	<b>Level of Evidence</b>	<b>Quality of Evidence</b>



(Author, Year, Title, etc...)	(Theoretical basis for study)		(Number, Characteristics, Exclusions, Criteria, Attrition)	(Independent variables; Dependent variables)	(What scales used-reliability information- alphas)	(What stats used?)	(Statistical finding or qualitative finding)	Level =	Strengths, Limits, Risks, Feasibility
<b>Article 25:</b>  Shearin, S. M., & Brewer-Mixon, K. (2020). Effectiveness of a short education series to reduce anxiety for health professions graduate students: A pilot study. <i>Journal of Physical Therapy Education</i> , 34(1), 12–18. <a href="https://doi.org/10.1097/jte.000000000000124">https://doi.org/10.1097/jte.000000000000124</a>	Exploratory research	Baseline assessment completed before beginning of first intervention with follow up testing at weeks 7 and 13  Intervention group did 4 intervention sessions focusing on practices of cognitive behavioral therapy and mindfulness	42 students attending UT Southwestern in health profession graduate studies without history of psychosis or psychiatric hospitalizations in the last 3 months	Independent variables: CBT/mindfulness sessions  Dependent variables: levels of depression, anxiety, general stress	Depression Anxiety Stress Scale (DASS 21) to evaluate depression, anxiety, and general stress; written subjective history of mental health issues; 5 question written survey to assess views about impact of interventions	SPSS used to perform analysis; missing data imputed using regression imputation method; socres on DASS-21 analyzed using repeated measures analysis of variance (ANOVA)	Mixed intervention of CBT, mindfulness, and lifestyle decreased reported levels of anxiety, depression, and overall distress	Level VI	Limitations: effect sizes were small, lack of control group, poor diversity, possible selection bias  Strengths: results in agreement with current literature
Citation (Author, Year, Title, etc...)	Conceptual Framework (Theoretical basis for study)	Design/Methods	Sample/Setting (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions (Independent variables; Dependent variables)	Outcome Measurement (What scales used-reliability information- alphas)	Data Analysis (What stats used?)	Findings (Statistical finding or qualitative finding)	Level of Evidence Level =	Quality of Evidence Strengths, Limits, Risks, Feasibility
<b>Article 26:</b>  Stillwell, S. B., Vermeesch, A. L., & Scott, J. G. (2017). Interventions to reduce perceived stress among graduate students: A systematic review with implications for evidence-based practice. <i>Worldviews on Evidence-Based Nursing</i> , 14(6), 507–513. <a href="https://doi.org/10.1111/wvn.12250">https://doi.org/10.1111/wvn.12250</a>	Exploratory research	Systematic review of articles from CINAHL, PsycINFO, and MEDLINE	8 studies meeting following criteria: self-care, graduate students, perceived stress, quantitative analysis within U.S. that were peer reviewed	Independent variables: interventions varying from stress management courses, mind-body-stress reduction techniques  Dependent variable: perceived stress	Perceived stress measured by Perceived Stress Scale (PSS)	Critical appraisal tools of Joanna Briggs Institute for quasi-experimental studies and RCTs	All studies demonstrated a reduction in perceived stress after intervention	Level I	Strengths: reduction in perceived stress within 8 studies meeting inclusion criteria, use of same measurement tool, similarities in interventions; search can
Citation (Author, Year, Title, etc...)	Conceptual Framework (Theoretical basis for study)	Design/Methods	Sample/Setting (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions (Independent variables; Dependent variables)	Outcome Measurement (What scales used-reliability information- alphas)	Data Analysis (What stats used?)	Findings (Statistical finding or qualitative finding)	Level of Evidence Level =	Quality of Evidence Strengths, Limits, Risks, Feasibility
<b>Article 27:</b>	Exploratory research	Subjects participate in 6 week workshop	23 graduate students across 4 health professions	Independent variable: graduate student status, 6 week workshop	Cognitive Affective Mindfulness Scale-Revised; Perceived Stress Scale; Penn	Qualitative comments coded and categorized	Students demonstrated improvements in all measures over the 6 week workshop, also	Level VI	Weaknesses: unequal distribution of

<b>Willgens, A., &amp; Palombaro, K. (2019). A mindfulness workshop for health science graduate students: Preliminary evidence for lasting impact on clinical performance. <i>Journal of Physical Therapy Education, 33</i>(2), 144–151.</b> <a href="https://doi.org/10.1097/jte.000000000000089">https://doi.org/10.1097/jte.000000000000089</a>		for stress management; pre and postworkshop measures of worry, perceived stress, isolation, self-judgment, self-kindness, overidentification and mindfulness were measured; were also re-evaluated 9 months later		Dependent variables: worry, stress, isolation, mindfulness	State Worry Questionnaire; “How I typically act toward myself in difficult times”	using generic qualitative analysis  SPSS used for quantitative data analysis; Wilcoxon’s signed ranks tests for pretest and posttest data	reported positive influences in clinical performance		disciplines, small sample size, no control group, mixed methods approach
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***** <b>Substance Use in Anesthesia Professionals</b> *****		
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Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 28:</b> <b>Bozimowski, G., Groh, C., Rouen, P., &amp; Dosch, M. (2014). The Prevalence and Patterns of Substance Abuse Among Nurse Anesthesia Students. <i>American Association of Nurse Anesthetists, 82</i>(4).</b>	Exploration/expl oratory research	An electronic survey sent to program directors (PD) of 112 accredited nurse anesthesia programs in US.  Asked for responses to be based on current and historical (5 years) incidents of student substance abuse including drug used and student outcome (ie: termination, readmission, loss of license, death), how incident was identified, and interventions employed.	111 programs included with 21.7% complete response rate from PD and additional 42% partial survey response rate from PD.  2439 students admitted over 5 year study period.	Substance use Drug of choice Risk factors for substance use	Instrument used was solely reporting from PD, no scales or psychometric assessments performed.	Descriptive statistics	<b>Prevalence and demographic data:</b> -60.8% identified at least 1 incident of student substance abuse. -total of 16 incidents for all 23 programs -prevalence rate of 0.65% for all 2439 admitted students -Clinical staff discovered majority of incidents  <b>Drug of Choice, risk factors, outcomes:</b>  -opioids most frequent (9), alcohol (4), cannabis (3), benzodiazepines (1), cocaine (1), polydrug (1)  -50% with no known risk factor for substance misuse, 3 students had personal history of substance use, 3 students had a family history of substance use  -10 students voluntarily entered treatment (6 completed, 4 returned to program), 7 students dismissed from program, 2 incidents resulted in loss of license.  <b>Screening procedure data:</b>	Cross sectional retrospective study  LOE: VI	-Insturment limited analysis to descrtptive data only  -No psychometric assessments performed to assure validity or reliability  -21.7 full respnse rate  -study relies on DOCUMENTED instances of substance use

ASSESSMENT OF WELLNESS IN NURSE ANESTHESIA STUDENTS							70		
							-drug testing for cause and pre-enrollment background checks most commonly reported following pre-enrollment drug testing. 5 programs reported risk factor assessments.  <b>Wellness promotion practices:</b>  -18/47 PD reported on wellness promotion practices with Educational offerings (7), wellness activities (8), faculty support (6) most common		
<b>Citation</b>  <b>(Author, Year, Title, etc..)</b>	<b>Conceptual Framework</b>  <b>(Theoretical basis for study)</b>	<b>Design/Methods</b>	<b>Sample/Setting</b>  <b>(Number, Characteristics, Exclusions, Criteria, Attrition)</b>	<b>Major Variables; definitions</b>  <b>(Independent variables; Dependent variables)</b>	<b>Outcome Measurement</b>  <b>(What scales used- reliability information- alphas)</b>	<b>Data Analysis</b>  <b>(What stats used?)</b>	<b>Findings</b>  <b>(Statistical finding or qualitative finding)</b>	<b>Level of evidence</b>  <b>Level=</b>	<b>Quality of Evidence</b>  <b>Strength Limits Risks Feasibility</b>
<b>Article 29:</b>  Bryson, E. O. (2020). The impact of chemical dependency on health care professionals involved with the delivery of anesthesia. <i>International Anesthesiology Clinics</i> , 58(1), 45–49. <a href="https://doi.org/10.1097/aia.000000000000257">https://doi.org/10.1097/aia.000000000000257</a>	Informative article	Literature review	N/A	N/A	N/A	N/A	-Current prevalence of SUD in healthcare population is 15.4% with and increasing rate of SUD in anesthesia residents currently at 2.87 per 1000  -Anesthesia professionals experience several risk factors for SUD over the general population including: <ol style="list-style-type: none"> <li>Ready access to pharmaceutical grade opioids and other medications</li> <li>Specific knowledge of mind altering substances not easily accessible by the general population and other healthcare professionals (ie: volatile agents and propofol) and how to counteract unwanted and recognizable side effects (versed to counteract cocaine-induced excitability)</li> <li>Impact of SUD in anesthesia professionals includes restrictions on practice, <b>commonly initial presenting sign of SUD in anesthesia professionals is death,</b></li> </ol> -Both ASA and AANA recommend that SUD/wellness policy promotes	Background information/li terature review	Specific information on SUD in anesthesia professionals

							<p>awareness and education of SUD risk factors and s/s, provider drug testing, establishment of medication diversion prevention program, and having a process in place for reporting individuals of suspected impairment with an effective intervention program with transition to evaluation for treatment</p> <p>-AANA Peer Assistance Advisory Committee provides immediate access to group of knowledgeable anesthesia professionals who can provide answers and advise to those seeking information about SUD treatment</p> <p>-Anesthesia professionals work in a ‘safety sensitive position and all impaired providers are at risk for misinterpretations of data, slower reaction times, and patient harm whether under the influence of a drug or in withdrawal.</p> <p>-Risk reduction techniques include prevention, education, identification, and treatment</p>		
<b>Citation</b>  (Author, Year, Title, etc..)	<b>Conceptual Framework</b>  (Theoretical basis for study)	<b>Design/Methods</b>	<b>Sample/Setting</b>  (Number, Characteristics, Exclusions, Criteria, Attrition)	<b>Major Variables; definitions</b>  (Independent variables; Dependent variables)	<b>Outcome Measurement</b>  (What scales used- reliability information- alphas)	<b>Data Analysis</b>  (What stats used?)	<b>Findings</b>  (Statistical finding or qualitative finding)	<b>Level of evidence</b>  Level=	<b>Quality of Evidence</b>  Strength Limits Risks Feasibility
<b>Article 30:</b>  Wright, E. L., McGuiness, T., Moneyham, L., Schumacher, J. E., Zwerling, A., & Stullenbarger, N. E. (2012). Opioid abuse among nurse anesthetists and anesthesiologists. <i>AANA Journal</i> , 80(2), 120–128.	Informative article	Literature review	N/A	N/A	N/A	N/A	<p>Higher rates of substance abuse among anesthesia providers, particularly with opioids, propofol, and benzodiazepines</p> <p>Risk factors for development of substance use disorder included: biological factors, genetic factors, attitude, access to substances, psychological factors, occupational factors, and stress</p> <p>More research needed on prevention programs and identifying early risk factors</p>	(Background information/literature review)	Strength: thorough and informative literature review of 50 articles



Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 31:</b> MacIntyre, P., Stevens, B., Collins, S., & Hewer, I. (2014). Cost of Education and Earning Potential for Non-Physician Anesthesia Providers. <i>AANA Journal</i> , 82(1), 25–31.	Exploratory	Cost data collected from each school’s respective website (tuition and fees)	111 accredited nurse anesthesia education programs (60 private, 48 public)  Excluded: program in Puerto Rico, military based programs	Dependent variables: cost of tuition, provider compensation	N/A	Values pulled directly from official websites- no statistical analysis	Median cost of public CRNA programs: \$37, 243  Median cost of private CRNA programs: \$61, 345  Average CRNA compensation: \$156,6422  Average cost of private AA program: \$77,155  Average AA compensation: \$123,328  Conclusions: -if student has no undergraduate education or has already received BSN, nurse anesthesia school is better economic method (higher earning potential and no geographical practice restrictions in U.S.) -if prospective student has bachelor’s in any other major, AA would be more economical option	Level VII	Limitations: No differentiation between masters/DNP degrees, fees not standardized between schools, out-of-state costs not considered, limited AA compensation resources
Citation  (Author, Year, Title, etc..)	Conceptual Framework  (Theoretical basis for study)	Design/Methods	Sample/Setting  (Number, Characteristics, Exclusions, Criteria, Attrition)	Major Variables; definitions  (Independent variables; Dependent variables)	Outcome Measurement  (What scales used- reliability information- alphas)	Data Analysis  (What stats used?)	Findings  (Statistical finding or qualitative finding)	Level of evidence  Level=	Quality of Evidence  Strength Limits Risks Feasibility
<b>Article 32:</b> Mathis ME. (1993). The attrition rate of students in master’s level nurse anesthesia programs. <i>AANA Journal</i> , 61(1), 57–63.	Exploratory	Descriptive study using survey to examine attrition rates in nurse anesthesia programs	Survey sent to 60 master’s level anesthesia programs that were accredited by the COA with a response rate of 86%	Independent variables; reasons for students not completing program  Dependent variables: attrition rate, point in which students are likely to drop out	N/A	Descriptive statistics- frequency, percentage, mean, and standard deviation	Attrition rate over 5 year period was averaged 8%  Over 50% of students that left left for personal reasons (including health-related problems)  Most students left in first year of program	Level VI	Limitation: only looked at attrition rate- not those who passed boards; very old study (limited generalizability)