

THE IMPACT OF MANDATORY SUBSTANCE USE DISORDER EDUCATION ON PEER  
PERCEPTION OF IMPAIRMENT IN NURSE ANESTHESIA CARE PROVIDERS

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KATRINA VICE O'CON, DNAP, CRNA

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## DEDICATION

For my husband, David, and my children, Gunner, Chase, Finley, and Emmy.

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## ABSTRACT

KATRINA VICE O'CON

### THE IMPACT OF MANDATORY SUBSTANCE USE DISORDER EDUCATION ON PEER PERCEPTION OF IMPAIRMENT IN NURSE ANESTHESIA CARE PROVIDERS

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Peer perceptions of substance use disorder (SUD) and the considerable bias and stigma towards those suffering from or recovering from SUD were the central focus of this study. Stigma may lead to impaired providers trying to overcome SUD alone rather than seek assistance from their colleagues. A gap exists in the literature examining perceptions of impairment between nurse anesthesia care providers (NACPs) with and without SUD education, the impact of demographics, and personal and professional factors that influence those perceptions. Therefore, this study aimed to determine the presence of and the relationships between SUD education, demographics, personal or professional factors and NACPs' attitudes toward impairment among their colleagues.

An electronic survey was sent to American Association of Nurse Anesthesiology members. Participants responded to a 55-item questionnaire, which included the Perceptions of Nurse Impairment Inventory. An independent *t*-test revealed that perceptions were more positive in NACPs who received SUD education ( $M = 62.44$ ,  $SD = 7.124$ ) than those who did not ( $M = 64.17$ ,  $SD = 6.919$ ).

A multiple regression analysis was conducted to predict perceptions of nurse impairment from demographic characteristics. The model explained 4.5% of the variance in perceptions of nurse impairment,  $F(4, 185) = 3.220$ ,  $p = .014$ , adj.  $R^2 = .045$ . None of the four variables added statistical significance to the prediction,  $p < .0005$ , although age made the largest unique contribution to the model (beta = .218).

Similarly, a multiple regression analysis was conducted to predict perceptions of nurse impairment from personal and professional factors. The model explained 5.4% of the variance in the perception of nurse impairment. Although none of these five variables added statistical significance to the prediction,  $F(6, 165) = 1.511$ ,  $p = .178$ ,  $\text{adj. } R^2 = .018$ , years of nursing experience made the largest unique contribution ( $\text{beta} = .154$ ), followed by a personal history of SUD ( $\text{beta} = .138$ ).

Recommendations for future studies include a longitudinal-designed study to correlate peer perceptions of anesthesia care provider impairment with specific educational content requirements and the incidence of SUD and perception among those providers.

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## CHAPTER I

### INTRODUCTION

Substance use disorder (SUD) prevalence among healthcare professionals has been recognized for over a century (Monroe & Kenaga, 2011). Between 2003 and 2014, the rate of SUD among anesthesia providers increased by 10-15% (Foli et al., 2022). Some studies have identified the incidence of SUD as high as 20% among physician anesthesiologists and certified registered nurse anesthetists (CRNAs; Luck & Hedrick, 2004; Monroe & Kenaga, 2011). This increase in SUD incidence led observers to label SUD as the greatest occupational hazard facing this specialized care provider group (Foli et al., 2022; Quinlan, 2003). However, such data is likely an underestimation as these data represent only identified cases (i.e., reported cases, direct observation, overdose, or referral to a treatment program; American Association of Nurse Anesthesiology [AANA], 2021a; The Joint Commission [TJC], 2019; Samuelson & Bryson, 2017). Kunyk (2015) suggested that underreporting may occur due to stigma, shame, and denial of the problem. Additionally, intolerant or negative behaviors such as disdain and rejection by a colleague may lead to those suffering from SUD to not reach out for assistance, delaying treatment (Bartlett et al., 2013). Finally, SUDs, especially those that involve medications commonly associated with anesthesia, lead to inadequate or substandard patient care, and may lead to additional considerations such as diversion and theft resulting in legal ramifications (AANA, 2021a; Bartlett et al., 2013).

Substance abuse has many indirect consequences, such as increasing mental and physical stress and destabilizing family dynamics, which may destroy a vital source of support. The incidence of suicide among nurses is two-fold greater than the general population with CRNAs at higher risk than non-CRNA nurses (Davidson et al., 2019). Additionally, Valdes (2014), Warner

et al. (2020), and Wright et al. (2012) described the high incidence of relapse and suicide deaths among anesthesia care providers who suffer from SUD. Notably, opioid and benzodiazepine overdose were reported as the most common method of suicide among clinicians, with opioids, such as fentanyl, cited as the drug of choice for anesthesia providers (Davidson et al., 2019; Shoshiashvili, 2020).

Stigma and shame associated with SUD are reasons that healthcare providers avoid seeking treatment for impairment (American Psychiatric Association [APA], 2013). Public stigma, self-stigma, and institutional stigma involving unconscious and conscious bias and negative or discriminatory attitudes towards people with mental health issues, including SUD, can create barriers to access to care (Bartlett et al., 2013; Knaak et al., 2020; National Center for Cultural Competence [NCCC], n.d.). A delay in seeking treatment for SUD can lead to feelings of hopelessness, difficulties at work, worsening symptoms, and a decreased likelihood of successful treatment (APA, 2013). Although most healthcare agencies provide employee assistance programs, the Center for Workplace Mental Health (2016) reported that only about 3% to 5% of employees utilize employee assistance program services.

Since 2011, the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) has required chemical dependency and wellness education within nurse anesthesia education program (NAEP) curricula. The required SUD educational components must include the concepts of wellness, healthy coping mechanisms, identification of the indicators of diversion, symptoms of impairment, and interventional strategies (COA, 2022a; Rupprecht, 2022). Although the COAs accreditation standards glossary defines SUD as a chronic and progressive disease, content covering the pathophysiology of SUD is not required. The curriculum standard neither specifies a minimum number of hours required nor demands proof of

concept mastery to be compliant with the COAs accreditation requirement. Furthermore, the standard does not dictate the timing of the content or the format by which the education should be delivered (COA, 2022a).

The National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) is the national certification body for nurse anesthetists' initial and continued recertification (NBCRNA, 2021). Since 1978, the nurse anesthesia profession has required board certification to practice as a CRNA. The NBCRNA administers the National Certification Examination (NCE), which assesses graduate nurse anesthetists' requisite knowledge and skills for safe entry-level clinical practice after graduation from an NAEP. NBCRNA is also responsible for assessing ongoing clinical competence of practicing CRNAs through the Continued Professional Certification Program (CPC). The Continued Professional Certification Assessment (CPCA) is a comprehensive exam that must be taken once every 8 years. Moreover, although the CPC lists "considerations for substance use disorder" on its content outline, there is no requirement for continuing education related to SUD to maintain the CRNA certification (NBCRNA, 2021).

The lack of standardized SUD educational content during NAEPs and no continuing education requirement may contribute to the continued "conspiracy of silence" within the nurse anesthesia profession (Quinlan, 2003). However, the most significant barrier preventing a colleague from asking for peer assistance may be NACPs' unconscious or conscious bias in the form of hostility or negativity toward those with SUD (Dolezal & Lyons, 2017). The hesitation in asking for help leads to delayed treatment, disciplinary actions, criminal charges, loss of income, physical and mental health disorders, and in some instances, death by overdose (Bartlett

et al., 2013; Bettinardi-Angres & Garcia, 2015; Dolezal & Lyons, 2017; Lefever-Watson et al., 2020).

### **Problem of Study**

The American Medical Association (AMA) classified addiction as a disease in 1987 (Bettinardi-Angres & Angres, 2010). The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)*, classified SUD as the combination of two previously separate classifications: substance abuse and substance dependence (APA, 2022). The *DSM-5-TR* measures SUD on a continuum from mild to severe. The diagnostic criteria for SUD require the presence of two or more positive answers to questions in the following categories within 12 months: (a) maladaptive pattern of substance use which leads to distress, (b) social impairment, (c) risky use, and (d) pharmacological conditions such as tolerance or withdrawal (APA, 2022). However, because of some people's early learning and socialization, life experiences, or negative societal portrayals, some do not consider SUD as an illness, but rather, a moral deficit (NCCC, n.d.).

Data collected for the 2020 National Survey on Drug Use and Health included substance use and alcohol use and targeted 67,500 household and noninstitutional group setting residents in three age groups (12-17, 25%; 18-25, 25%;  $\geq 26$ , 50%; Substance Abuse and Mental Health Services Administration [SAMHSA], 2021). During web-based interviews, participants were asked about their current or previous 12-month drug or alcohol use. Using the *DSM-5* diagnostic criteria for SUD, the SAMHSA (2021) indicated that 38.4% (38.7 million) of people aged 18 or older were classified as having SUD, and 25.9% (27.6 million) people aged 18 or older were classified as having alcohol use disorder.



Additionally, according to the AANA, there are approximately 62,000 CRNAs and student registered nurse anesthetists (SRNAs) nationwide, which suggests that between 6,220 (10%) and 9,300 (15%) CRNAs and SRNAs potentially misuse or are addicted to drugs or alcohol (AANA, 2021a; Bryson, 2020; Rupprecht, 2022). Moreover, the Centers for Medicare and Medicaid Services (CMS, 2010) describe three types of providers licensed to provide anesthesia and related care services: (a) physicians (Doctor of Medicine or Osteopathy), (b) CRNAs, and (c) anesthesiologist assistants (AAs). Nurse anesthesia care providers include CRNAs and SRNAs, and although any anesthesia providers may be diagnosed with SUD, this study focused on providers who are registered nurses (RNs).

Opioid medications (i.e., fentanyl, Sufentanil) and intravenous anesthetic medication (i.e., propofol) are consistently cited as anesthesia providers' drugs of abuse (Bozimowski et al., 2014; Bryson & Silverstein, 2008; Wright et al., 2012). The Centers for Disease Control and Prevention (CDC) reported that synthetic opioid overdose deaths (including fentanyl) increased by 56% from 2019 to 2020 (Hedegaard et al., 2021). Moreover, the rates of SUD and deaths related to opioid overdose have remained steady among anesthesia providers despite the addition of SUD content to curriculum requirements by the COA (Rodrigues et al., 2021). Finally, SAMHSA reported that in the calendar year 2020, 44,834 people died by suicide in the US, with suicide rates increasing more than 30% from 1999 to 2016 (2021).

Griffis et al. (in press) surveyed 122 NAEP program directors ( $N = 22$ ; 18% response rate) and 3,000 SRNAs ( $N = 134$ ; 4.7% response rate) to examine the effects of nurse anesthesia students' stress and resultant maladaptive coping behavior, including suicidal ideation and self-harm. Additionally, this study evaluates methods to improve wellness initiatives in NAEPs. Griffis et al. described that while all NAEPs include SUD content within the curricula, the

quality and quantity of the content varies greatly among NAEPs (in press). Current wellness programs in NAEPs included one to five individual lectures (33%) or integrated activities throughout the year (66%). The majority of NAEPs (90%) reported that the program's wellness content included SUD, lifestyle factors and wellness, AANA wellness resources, and access to local counseling services. Seventy percent of NAEPs included addiction physiology, and 50% included suicide recognition and prevention in their curricula (Griffis et al., in press). Griffis et al. inquired about strategies to improve wellness initiatives with respondents. Emerging themes included standardizing the wellness program content and methods to fit wellness content into a crowded curriculum (in press).

AANA wellness resources include a 5-part video wellness series created for the purpose of continued education and to assist NAEPs meet accreditation requirements. While the AANA 5-part wellness video series is provided to NAEPs, its use is not standard among all 128 accredited NAEPs (Griffis et al., in press). The 5-part wellness series includes one 71-minute video addressing the impaired provider and an 11-minute video addressing the health-related impact of shame and methods to overcome health-related shame (AANA, 2021b). Furthermore, SUD content may be delivered in any course within the course of study. Consequently, if NACP impairment and health-related shame are only discussed in the first year, SRNAs may progress through the remaining portion of the program without a single other mention of SUD. Finally, as NAEPs range from 36 to 51 months in length, the high required number of physiology, pathophysiology, pharmacology, and clinical practicum credit hours may be prioritized over a brief discussion of SUD.

Health-related shame plays a vital role in healthcare and can lead to inadequate or ineffective treatment (Dolezal & Lyons, 2017). Shame is characterized by social interaction

avoidances, leading to profound sequelae such as anger, depression, anxiety, low self-esteem, abnormal eating patterns causing further declines in health. Furthermore, while people who suffer from medical disorders such as hypertension, diabetes, or hyperthyroidism routinely seek assistance with treatment, the shame and stigma associated with SUD leads to limited outreach for help, further exacerbating the illness' burden (Dolezal & Lyons, 2017). According to Dolezal and Lyons (2017), shame is described as a barrier to asking for help diagnosing and managing health issues, which may result in negative coping behaviors, such as alcohol or drug use.

Currently, there is an ever-growing body of literature focused on recognizing and preventing impairment, drug diversion, drug control methods, treatment, and re-entry into practice for physician anesthesiologists and RNs suffering from SUD. Unfortunately, there is still a paucity of literature focusing on SUD among CRNAs. However, there are some articles describing substance abuse among physician anesthesiologists (Bettinardi-Angres & Garcia, 2015; Fitzsimons et al., 2018; Warner et al., 2020) and a few research studies focused on the attitudes and perceptions of CRNA impairment (Foli et al., 2022; Thomas, 2009). Yet, there is a gap in the literature examining the relationship between anesthesia program curriculum content and perceptions of peer impairment among NACPs, which is the central problem addressed in this study.

Finally, while anesthesiology residents-in-training are more likely to misuse substances than post-residency, practicing physician anesthesiologists, the prevalence of drug misuse is higher among CRNAs who have been in practice between 10 and 15 years, long after receiving SUD education in training (Bettinardi-Angres & Garcia, 2015; Wright et al., 2012). SUD has a high frequency, but much stigma is attached, so addressing the issues of use, misuse, abuse, and

impairment is challenging. Consequently, stigma toward SUD may cause impaired providers to try and overcome SUD alone rather than seek treatment (APA, 2013).

There is a need to change the perception of substance abuse from one of a moral character flaw to one of disease, thus reducing the stigma of SUD (APA, 2013; Bartlett et al., 2013; Knaak et al., 2020; Pavuluri et al., 2021). Even the most subtle negative attitude toward people suffering from SUD contributes to an unhealthy work environment and can adversely affect the care of addicted individuals (Finnell et al., 2022). However, the lack of SUD education in foundational healthcare provider curricula may lead to the ongoing perceptions of those with addictions as individuals without self-control or morally corrupt (Bartlett et al., 2013). The associated stigma attached to people suffering from SUD increases the likelihood that those attempting to overcome this problem will not seek support. A lack of support commonly results in poor outcomes, including relapse and death (Geuijen et al., 2021).

### **Purpose of Study**

This cross-sectional, correlational research study compared the perceptions of nurse anesthesia provider impairment between SRNAs and CRNAs who received SUD education and those who have not received SUD education. Additionally, this study examined the relationship between personal (age, gender, marital status, personal experience with SUD) and professional factors (educational background, years in practice, practice setting, professional experience with SUD) and perceptions of impairment among NACPs.

CMS reported a national shortage of nurses before the COVID-19 pandemic, which had a domino effect on the supply of CRNAs (Relias Media, 2021). Without a rigorous plan for addressing prevention, identification, recovery, and reentry into practice after SUD on a continuing basis, the staffing shortage caused by COVID-19 may be further exacerbated leading

to a disastrous impact on the workforce negatively affecting patient outcomes (Becker, 2021; Carter et al., 2019).

Sources estimate that 10% and 15% of nurses will misuse alcohol or drugs during their careers (TJC, 2019; Rodrigues et al., 2021). According to Luck and Hedrick (2004), the rate of substance misuse among anesthesia providers is as high as 20%. Researchers have cited various reasons for the incidence of SUD among anesthesia providers, such as stressful work environment, easy access to drugs with high abuse potential, genetic susceptibility, the feeling of invincibility, and high emotional intelligence (Carter et al., 2019; DeFord et al., 2019; Quinlan, 2003).

Tragically, the first recognized occurrence of SUD by an anesthesia provider may be an overdose, whether accidentally or intentional (Carter et al., 2019). Reasons that preclude SUD discovery among anesthesia providers are (a) an in-depth knowledge of pharmacokinetics, drug dosages, and side effects, (b) accessibility of high-potency drugs, (c) solitary work environment, (d) ease of diversion, (e) lack of specifically identifiable behavior cues, and (f) the reluctance of colleagues to report suspicions (DeFord et al., 2019; Quinlan, 2003; Toney-Butler & Siela, 2022). Professional colleagues are hesitant to make an accusation of impairment against another provider and may think abnormal behaviors are likely due to that provider “having a bad day.” But, most often, reluctance to report suspicions stems from a lack of work performance deterioration as it is typically the last symptom of impairment (Baldisseri, 2007; Samuelson & Bryson, 2017). Friends and family may also avoid reporting or intervening due to financial concerns or the general feeling that the provider’s “hard-earned” career should be protected if there is not absolute certainty of a problem (DeFord et al., 2019; Samuelson & Bryson, 2017).

The AANA recommended early identification of SUD as part of an effective education plan to meet the *Standards for Accreditation* published by the COA (2022a). However, the determinates of effective SUD education in NAEPs are not clear. TJC similarly recognized the threat of SUD, drug diversion, and provider impairment to patient safety. TJC suggested emphasis on developing and instituting comprehensive diversion response programs to assist in the detection and deterrence of diversion while supporting healthcare workers with SUD (Stone et al., 2021). Three components to consider when discussing management of drug diversion are prevention, detection, and response (TJC, 2019). Finally, TJC recognized that personnel with the greatest access to controlled substances, including anesthesia providers and pharmacy workers, are classified as high-risk for diversion (2019).

### **National Practitioner Data Bank**

The National Practitioner Data Bank Public Use Data File (NPDB, 2022) contains 1,676,479 cases of approximately 305,000 RNs and 3,225 CRNAs who have had adverse or clinical privilege action against their license. Additionally, any medical malpractice payments made personally or on the behalf of an RN or CRNA are listed within the NPDB. Beginning in 2010, the NPDB expanded the requirements for reporting licensure actions to include all healthcare practitioners and healthcare entities (NPDB, 2022). Prior to 2010, RNs and CRNAs were not routinely reported for licensure actions. Since 2002, the basis for actions related to SUD have included eight “drug screen violations” (3.3%), 19 “alcohol and other substance abuse” (8.0%), 21 “narcotics violations or other violation of drug statutes” (8.8%), 94 “inappropriate acquisition or diversion of controlled substances” (39.6%), and 95 “unable to practice safely by reason of substance abuse” (40.0%; NPDB, 2022).

A total of 2,949 CRNAs (92.3%) listed in the NPDB graduated from their professional degree programs prior to 2010 (NPDB, 2022). One thousand three hundred and fifty-two CRNAs (41.9%) were reported to the NPDB prior to 2011. The incidence of narcotics violations and diversion of controlled substances reported to the NPDB rose by 16.4% since the inclusion of the mandatory SUD education to the NAEP curriculum in 2011. The overall number of CRNAs listed in the NPDB has increased 58%, along with an increase in substance-related violations since 2011 (NPDB, 2022). The rising rate of substance-related occurrences questions the efficacy of non-standardized content as well as the absence of continuing education requirements in meeting the objectives of (a) increasing SUD knowledge, (b) decreasing the incidence of impairment among CRNAs, and (c) changing the perception of SUD from a moral deficiency to an illness (Stone et al., 2021).

### **State Board of Nursing License Disciplinary Action**

This research study examined peer perception of impairment among NACPs. To understand the significance of peer perception and how those perceptions may play a role in identifying and assisting colleagues in this specialized nursing field, it is important to establish the prevalence of SUD among CRNAs and SRNAs. Furthermore, while this study sought to provide evidence of the prevalence of SUD nationwide, an example of trends in drug-related disciplinary actions is presented from one state's board of nursing. Disciplinary actions on advance practice registered nurse (APRN) licenses in Louisiana have been published since 1990. An examination of the publicly available APRN disciplinary records of the Louisiana State Board of Nurses (LSBN) revealed 53 actions on APRN licenses (LSBN, 2023). Of the 53 disciplinary records published from 1990 through 2010, 16 APRN licenses were listed as clinical nurse specialists (CNSs; 1.9%), certified nurse practitioners (CNPs; 35.8%), and CRNAs

(62.3%). There were no Certified Nurse Midwives reported to the LSBN for disciplinary actions prior to 2011.

Thirty-three APRN license disciplinary actions from 1990 through 2010 were taken on 26 CRNA licenses. The SUD-related disciplinary actions against the CRNA licenses were drug screening violation (3.0%), narcotics violation or other violation of drug statutes (3.0%), inappropriate acquisition or diversion of controlled substances (6.0%), criminal conviction (9.0%), unable to practice safely by reason of alcohol or other substance abuse (45.4%), and other (24.2%; LSBN, 2023).

Since 2011, there have been 138 disciplinary actions against APRN licenses in Louisiana. Out of these APRNs, CNMs accounted for 0.7% ( $n = 1$ ), CNSs 1.4% ( $n = 2$ ), CRNAs accounted for 27.5% ( $n = 38$ ), and CNPs accounted for 70.3% ( $n = 97$ ). Of the 38 CRNA licenses, 29 (78.4%) received initial APRN licensure before 2011. Reasons for disciplinary action against the CRNA licenses were drug screening violation (5.2%), inappropriate acquisition or diversion of controlled substance (5.2%), criminal conviction (13.1%), unable to practice safely by reason of alcohol or other substance abuse (39.4%), and other (7.8%). Three of these CRNA licenses had an additional report of adverse actions taken against the license prior to 2011 (LSBN, 2023).

The number of disciplinary actions taken by the LSBN on APRN licenses increased from 53 before 2011 to 138 since 2011. Additionally, in 1986, the LSBN initiated its alternative-to-discipline (ATD) program, the Recovering Nurse Program (RNP), for RNs and APRNs with SUD (LSBN, 2021a). In their review of 14 states' Board of Nursing ATD programs, Bettinardi-Angres and Garcia (2015) described the average ATD program length as 3 years. Conditions to qualify for Louisiana's confidential RNP include a 5-year RNP commitment, agreement to work in a supervised setting, frequent drug screens, and verified participation in support groups such



as Alcoholics Anonymous and Narcotics Anonymous (Louisiana Administrative Code, 2020). Baldisseri (2007) reported successful recovery rates of approximately 75% for healthcare providers who completed a comprehensive treatment program with frequent posttreatment monitoring.

Disciplinary actions against nurses who successfully complete Louisiana's RNP remain confidential and are not publicly disclosed files. To maintain participant anonymity, RN and APRN licenses are not designated within the RNP (LSBN, 2021a). However, the total number of RNP participants is included in the LSBN Annual Report (LSBN, 2021b). The 2021 Annual Report indicated that a total of 451 participants were enrolled in the RNP, which is similar to the number of participants in 2020, 2019, and 2018. Out of the 451 participants listed in the 2021 Annual Report, 105 participants were listed in the "monitoring" phase of the program, 175 participants were listed as active confidential participants, and 171 were listed as disciplinary RNP participants (LSBN, 2021b).

Although there have been strides toward creating a culture of treatment rather than discipline, the quantity of participants enrolled in the ATD program remains staggering. Moreover, the consequences of non-compliance with the RNP requirements include automatic nursing license suspension or a directive to immediately return to inpatient treatment (LSBN, 2021b). Finally, non-compliance may lead to public notification of disciplinary action, job loss, loss of income and health insurance, and even criminal charges, further increasing the impaired nurse's financial burden (LSBN, 2021b).

Due to the high occurrence and many stigmas associated with SUD, it is a challenge to address SUD among NACPs. Luck and Hedrick (2004) suggested that considerable bias and stigma remain toward anesthesia care providers suffering from or recovering from SUD. Stigma

toward SUD sufferers may cause impaired providers to try and overcome this problem alone rather than seek treatment (Bartlett et al., 2013). Research has yet to examine how factors such as demographics, previous personal or professional experience with SUD, or educational content received in SUD alters the perceptions toward CRNA colleagues with SUD. Therefore, the purpose of this study is to examine how SUD-related education, age, gender, race/ethnicity, marital status, highest educational degree, clinical status, years of clinical experience, practice setting, and professional or personal experience with SUD affect the perceptions and attitudes toward SUD among anesthesia provider colleagues. Further, this study's results may demonstrate the effectiveness of SUD education in decreasing the stigma among NACPs, therefore, the argument can be made for standardizing SUD content in NAEPs and adding SUD education to re-certification requirements.

### **Research Questions**

The research questions that guided this study were as follows:

- RQ1. How does mandatory SUD education in nurse anesthesia educational programs impact peer attitudes toward SUD among anesthesia care providers?
- RQ2. What demographic factors (age, gender, race/ethnicity, marital status) correlate to a more tolerant attitude toward SUD in anesthesia care providers?
- RQ3. What professional factors (highest degree earned, years of experience, clinical practice setting, personal or professional experience with SUD) correlate to a more tolerant attitude toward SUD in anesthesia care providers?

The hypotheses for this study were as follows:

- H1. Anesthesia care providers who receive SUD education will have a more tolerant attitude toward colleagues suffering from SUD.

- H2. Anesthesia care providers with personal or professional experience with SUD will have a more tolerant attitude toward colleagues with SUD.

The null hypotheses for this study were as follows:

- H<sub>0</sub>1. There is no difference in attitudes toward colleagues with SUD among those who received and did not receive SUD education.
- H<sub>0</sub>2. There is no difference in attitudes toward colleagues with SUD related to demographic characteristics (age, gender, race/ethnicity, marital status) or professional factors (highest educational degree, years of experience, clinical practice setting, personal or professional experience with SUD).

### **Definitions of Terms**

The following section includes the theoretical and operational definition of key terms used in this research study. Standardized terminology provides clear and accurate descriptions and definitions of terms and concepts used in research studies.

Council on Accreditation of Nurse Anesthesia Educational Programs (COA): The U.S. Department of Education and the Council for Higher Education Accreditation (CHEA) recognized the COA as the national accrediting agency for NAEPs in the US and its territories, awarding post-master's certificates, and master's and doctoral degrees (CHEA, n.d.).

Addiction: The *DSM-5-TR* defined addiction as the use of a substance longer or more than intended or being unable to discontinue the substance (APA, 2022).

Attitude: The term attitude refers to an emotion, belief, or behavior toward a particular object, person, thing, or event (Chaiklin, 2011).

Certified Registered Nurse Anesthetist (CRNA): A CRNA is an APRN who graduated from an accredited NAEP and passed the National Certification Examination (NCE; AANA, 2022a).

Diversion: Diversion is transferring any drug from the person for whom it was prescribed for unintended purposes (Brummond et al., 2017).

Impairment: Impairment refers to the inability to engage in or provide safe, competent patient care due to physical, mental, or behavioral conditions such as with alcohol, medication, whether prescription or non-prescription, or mind-altering substances (AANA, 2021a).

National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA): The national credentialing agency for CRNAs, responsible for initial certification through the NCE and continued certification through the CPC.

Perception: Perception is an intuitive awareness of a moral, psychological, or aesthetic sense (Merriam-Webster, n.d.a). The total score on the Perceptions of Nurse Impairment Inventory (PNII; Hendrix et al., 1987) is operationalized in this study to measure CRNAs and SRNAs perception of peer impairment (dependent variable [DV]). Perceptions of peer impairment in NACPs is an independent variable (IV) in the research study.

Perceptions of Nurse Impairment Inventory (PNII): A 32-item survey developed by Hendrix et al. (1987) as part of The University of Kentucky College of Nursing's *Nurses Assisting Nurses* project. Hendrix et al. developed and used this questionnaire to determine attitudes toward impairment, specifically within the nursing field. Along with demographic information and various personal and professional factors, the PNII is included in the study survey (see Appendix A).

Shame: Shame is the negative feeling or emotion experienced by a person who feels they are being judged as inappropriate, guilty, immoral, or inadequate (American Psychological Association, n.d.).

Stigma: A stigma is a negative mindset attached to a characteristic of a person that may be considered a mental, physical, or societal defect (APA, 2013). Substance use-related stigma has been associated as a barrier to seeking care and successful recovery (Knaak et al., 2020). Five questions on the survey (26, 39, 40, 51, 54) were operationalized to evaluate stigma related to SUD in NACPs.

Student Registered Nurse Anesthetist (SRNA): An SRNA is a registered nurse who has earned a Bachelor of Science in Nursing degree and met the requirements for admission and is currently enrolled in a nurse anesthesia educational program (AANA, 2022a).

Substance Use Disorder (SUD): According to the *DSM-5-TR*, if the recurrent use of a substance causes significant problems (e.g., health problems, disability, or failing to meet home, school, or work responsibilities) the use is classified as a SUD. Previously substance abuse and substance use were two separate classifications, but the *DSM-5-TR* combined them into one category termed as *substance use disorder* (APA, 2022). Study participants were asked whether they have a personal history of SUD or experience with SUD in a colleague, friend, or family member. A personal history or experience with SUD was a DV in the study and was ascertained by three questions on the study survey (17, 21, 22).

SUD Education: SUD content delivered in an NAEP covering topics such as prevention of chemical dependency, identification of diversion, symptoms of impairment, methods aimed at assisting a colleague with SUD, and ways to mitigate the shame and stigma associated with SUD as an illness (COA, 2022a). SUD education received in an NAEP was a DV in the research study

and was operationalized by one question (13). The quality and quantity of SUD content was examined to determine the influences on peer perceptions of SUD. The quality and quantity of SUD education was operationalized by three questions on the research study survey (14, 15, 16).

Tolerance: A tolerant attitude is described as the willingness to accept a behavior that contrasts with one's belief system without agreeing with or condoning the behavior (Merriam-Webster, n.d.b). Nonjudgmental, tolerant attitudes are considered key when assisting those with SUD to achieve successful treatment and recovery (Bartlett et al., 2013). Tolerance of peer impairment is operationalized in the study by the total score on the PNII (23 - 55).

### **Significance of the Study**

CRNAs administer over 50 million anesthetics each year in the US (AANA, 2022a). Practice settings for CRNAs include traditional hospital operating rooms, obstetrical delivery rooms, ambulatory surgery centers, rural and critical access hospitals, and physicians' and dentists' offices. Most rural anesthesia is delivered in CRNA-only settings, often increasing access to care for these areas. Research has shown that CRNAs are safe, high-quality anesthesia providers with no difference in care quality from physician anesthesiologists (AANA, 2022a).

CRNAs are APRNs, who practice with a high degree of autonomy in most settings. In the U.S. military, CRNAs are the full-practice, primary providers of anesthesia care on the front lines, aboard U.S. Naval hospital ships, and air-based evacuation teams (AANA, 2022a). According to a December 2020 Gallup poll, nurses consistently rate highly for honesty and ethics (Saad, 2020). As nurses, CRNAs garner a high degree of professional respect and trust. Furthermore, the U.S. News and World Report (2022) listed nurse anesthesia as the 10th out of 100 best healthcare jobs.

A career as a CRNA is highly sought-after, with a median salary of \$195,610 and a 0% unemployment rate (U.S. Bureau of Labor Statistics, 2021). The demand for CRNAs is expected to grow by 40% in the next decade compared to 6% for RNs. CRNAs are predominantly women (62%) and White/Caucasian (88%; American Association of Colleges of Nursing [AACN], 2022; AANA, 2022a). The high level of job satisfaction and favorable employment outlook make CRNA a desirable career choice. Becoming a CRNA takes an estimated 7 to 8.5 years, including education and experience. The educational requirement for an entry-level NACP is a doctorate degree, with programs ranging from 36 to 51 months in length (AANA, 2022a).

High-performing RNs admitted to NAEPs possess the same characteristics as CRNAs and can fall prey to similar difficulties, such as physical and psychological impairments like anxiety, depression, and suicide (Chipas et al., 2012). The AANA recognized the problems associated with emotional and physical stress and in 2004, initiated a vigorous program aimed at increasing well-being among SRNAs and CRNAs. The AANA wellness initiative resulted in programs offering health and wellness resources, peer assistance, and a suicide hotline (AANA, 2022b). Although repeatedly proven safe, there is a thin margin for error in anesthesia (Gottschalk et al., 2011). Anesthetic errors associated with stress and substance misuse include lapses in attention, vigilance, and critical-thinking skills, typically associated with significant patient mortality or morbidity (Attri et al., 2016). Therefore, the emotional and physical well-being of anesthetists is of utmost importance.

More exposure to SUD and people with SUD leads to more positive interactions and experiences, reducing bias towards people with SUD, resulting in earlier recognition, intervention, and improved chances of successful recovery (Bartlett et al., 2013; Carter et al., 2019). Consequently, without a plan for addressing prevention, identification, recovery, and

reentry into practice after SUD in school and beyond, the staffing shortage of CRNAs will continue to worsen the workforce, potentially causing deleterious effects to patient outcomes (Becker, 2021; Carter et al., 2019).

### **Theoretical Framework**

Perceptions and attitudes toward people afflicted with certain diseases are often subject to change based on experiences or exposure to that particular disease. Mezirow (1997) developed the transformative learning theory, which serves as the theoretical framework for this study. Transformative learning asserts that adults form perceptions and attitudes through experiences and that those experiences create their worldview. Negative perceptions learned in childhood and adolescence are often accompanied by mental or behavioral activities that may be perceived as biased or judgmental (NCCC, n.d.). People who learn negative perceptions in their formative years may be unwilling to consider alternative thinking and hold conscious or unconscious bias toward others possessing particular characteristics or traits. The transformative learning theory challenges adult learners' existing perceptions by using disorienting dilemmas (Mezirow, 1997).

Transformative learning suggests learners can evolve their thinking or beliefs by assimilating new education. Mezirow (1997) believed transformative learning was the path to a less discriminatory frame of reference. A frame of reference results from caregiver influence and cultural lifestyle and is classified into habits of mind and points of view. Habits of mind are broad habitual ways of thinking, feeling, or behaving influenced by one's assumptions and are associated with a specific worldview.

Mezirow theorized that adults could transform their worldviews and perspectives by critically reflecting on their own assumptions. He asserted that transformative learning focuses on two types of learning—instrumental and communicative. Instrumental learning, one of the



concepts within the transformative learning theory focuses on learning through the determination of cause-and-effect relationships. The second concept included in the transformative learning theory is communicative learning and involves how individuals communicate their feelings. The concepts developed within the transformative learning theory could increase the recognition of an alternative way of understanding, resulting in changes in bias and negative or discriminatory attitudes (Mezirow, 1997).

To reduce SUD stigma, there is a need to change the perception of substance abuse from one of a moral character flaw to one of disease, thus reducing the stigma of SUD (APA, 2013; Bartlett et al., 2013; Knaak et al., 2020; Pavuluri et al., 2021). An intolerant attitude, regardless of subtleness, towards people suffering from substance abuse contributes to an unhealthy work environment and can adversely affect the care of addicted individuals (Bartlett et al., 2013; Finnell et al., 2022). Negative perceptions and attitudes result from early learning, socialization patterns, life experiences, and negative societal portrayals in the media, and affect all people, including healthcare providers (Bartlett et al., 2013; NCCC, n.d.). Addressing perceptions and bias toward impairment in foundational curricula is a start, but the *AACN Essentials: Core Competencies for Professional Nursing Education* does not contain a requirement for content related to the recognition of SUD (AACN, 2021).

Specific to physician anesthesiologists, the Accreditation Council for Graduate Medical Education's (ACGME) *Common Program Requirements* include providing content and clinical experience in pain management, including recognizing SUD, but only if applicable to the specialty. Additionally, the ACGME requirements emphasized the ability to recognize impairment in themselves and others, whether it stems from substance use, fatigue, or illness (2022). The limited SUD content required by the ACGME is not likely adequate as the reported

risk and mortality due to SUD for physician anesthesiologists is higher compared to other physician specialties (Bozimowski, 2014; Wright et al., 2012). Samuelson and Bryson (2017) suggested that education efforts focused more on primary SUD prevention in physician trainees may help adequately prepare physicians when faced with provider impairment and patients with SUD. Additionally, more education and open communication about SUD can lead to a higher sense of security for colleagues who experience SUD when ask for help (Bartlett et al., 2013; Samuelson & Bryson, 2017).

### **Limitations**

Limitations to this research study include the study design, sample size, lack of previous research studies addressing SUD and nurse anesthesia providers, methods used to collect data, and time constraints. The use of a non-experimental study design may be viewed as weaker than other options as the groups studied are pre-formed instead of randomized. Correlation may be hard to interpret as some characteristics or behaviors of participants may relate to factors not included or mentioned in the study. As such, results from cross-sectional, correlational studies are considered tentative (Polit & Beck, 2021).

The strengths of cross-sectional studies include less expense and faster data collection. Although correlational studies cannot show cause-and-effect, they may uncover potential naturally occurring relationships. Additionally, although correlational studies are not considered as rigorous as experimental research, findings from these studies may form the basis for more in-depth experimental studies. However, the results from correlational studies should be used with caution to avoid suggesting causation, even when there is a strong relationship (Polit & Beck, 2021).

Though correlational studies are listed as lower-level research evidence, they can examine interrelationships among a larger number of variables. Additionally, the results from correlational studies may serve as the basis for more focused, in-depth experimental studies (Polit & Beck, 2021). Furthermore, correlational studies are preferred when experimental trials are either not feasible or unethical to conduct, and while not designed to predict causality, correlation between variables can be assessed (Lau & Kuziemy, 2017).

### **Chapter Summary**

The conducted research study is organized and presented in five chapters. Chapter 1 introduced the background of SUD among anesthesia care providers and SUD educational content delivered in NAEPs. The chapter also discussed the prevalence of SUD and diversion among anesthesia providers, presented the guiding research questions, limitations, and assumptions of the study, and introduced key terms. Chapter 2 provides a comprehensive literature review on the perceptions of SUD and impairment among different healthcare groups. Chapter 3 presents and discusses the methodology employed in this research study. Statistical analysis of data is presented in Chapter 4. Finally, a comprehensive summary of the findings and implications of the study is discussed in Chapter 5.

## CHAPTER II

### REVIEW OF LITERATURE

RNs' perceptions of SUD can vary. Some RNs may view SUD as a personal failing, a moral defect, or a sign of weakness. Meanwhile, other RNs may view it as a chronic disease that requires support and treatment. Many RNs understand the stress and demands of their profession and may be more empathetic towards their colleagues struggling with SUD. However, there may also be concerns about the impact of SUD on patient safety and the need for strict policies to ensure impaired nurses do not practice. Chapter 2 reviews the literature on SUD education and perceptions of SUD among healthcare providers. This chapter discusses SUD education requirements in various healthcare disciplines and assesses the influences of education through the lens of statistical outcome measures.

#### **Search Strategies**

A systematic search was conducted for reports published from 2000 to December 31, 2022, through the following databases: Academic Search Complete, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PubMed. The search report followed the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guideline (Page et al., 2021). The systematic search included the following search terms: "substance use disorder," "education," "anesthesiologist," "nurse anesthetist," "perception of impairment," "attitudes," and "stigma." In addition, various combinations of the Medical Subject Heading (MeSH) terms, subject headings, and keywords were used with the Boolean operators and truncation, such as "SUD AND anesthesia."

## **Inclusion and Exclusion Criteria**

The literature search included only peer-reviewed articles published between 2000 and 2022 in English. The age range for participants was set to adults only, as this is the age range for post-baccalaureate nurse anesthesia students and CRNAs.

The initial search with these limiters yielded 64 articles from PubMed, 128 articles from Academic Search Complete, and 168 articles from CINAHL, resulting in 360 articles. Twenty-one articles were duplicated between the various databases and excluded. The titles and abstracts of the remaining 339 records were screened for eligibility. Articles that did not include the target population of healthcare providers were excluded. After excluding 241 articles from the title and abstract screening, 98 full-text articles were sought and further evaluated for inclusion eligibility. Twenty-two articles were unavailable due to lack of an institutional or personal subscription to the articles' databases. Seventy-six full-text reports were read entirely, and 52 full-text articles were excluded (see Appendix B; Haddaway et al., 2022).

Twenty-four articles were critically appraised using the Johns Hopkins Evidence-Based Practice for Nurses and Healthcare Professionals guidelines (Dang et al., 2022). Critically appraising literature is essential to formulating hypotheses and research questions using valid research. In addition, determining evidence levels and quality is essential in deciding whether to include or exclude research findings in an integrative literature review.

## **Study Design and Evidence Level**

Articles meeting eligibility criteria were critically appraised. Of the 24 included articles, one article was Level I (O'Brien et al., 2019), five articles were Level II (Boulton & Nosek, 2014; Damewood et al., 2022; Elliott et al., 2021; Jackman et al., 2020; Lanzillotta-Rangeley et al., 2020), and 18 articles were Level III (Avery et al., 2020; Barry et al., 2015; Foli et al., 2019;

Geuijen et al., 2020; Kubayi, 2019; Kunyk, 2015; Matthias-Anderson & Yurkovich, 2016; May et al., 2002; Mitchell et al., 2018; Murnane et al., 2022; Pecoraro et al., 2021; Pringle et al., 2017; Schuler & Horowitz, 2020; Senreich et al., 2017; Shreffler et al., 2021; Thomas, 2009; Trinkoff et al., 2021; Williams et al., 2020). Each article was appraised for quality, with 19 sources determined to be high quality and five determined as medium quality using the Johns Hopkins Evidence-Based Practice for Nurses and Healthcare Professionals guidelines (Dang et al., 2022).

### **Substance Use Disorder Education**

Traditional medical and nursing educational curricula include both didactic and clinical learning (AACN, 2021; ACGME, 2022). Whether targeted to physicians, nurses, or other allied health students, educational content aims to prepare the student academically for safe future clinical practice. A comprehensive SUD education curriculum for healthcare personnel should address knowledge gaps, stigma, and effective treatment options (Pavuluri et al., 2021). Additionally, the ability to recognize impairment in a colleague can lead to early intervention and treatment (APA, 2013). Consequently, most sources agree that identification of signs and behaviors indicative of SUD should be included in undergraduate foundational curricula.

Mental health and wellness topics have recently been included in SRNAs' academic preparation (COA, 2022a). Currently, 128 accredited NAEPs are in the US and Puerto Rico (COA, 2022b). The inclusion of wellness content, including SUD, was added to the curriculum requirement in 2011 by the COA; however, no quantitative guidelines were included. Without standardization and only the requirement for the inclusion of conceptual components in a program of study, the likelihood of 128 different educational modules existing is high, which may lead to inconsistencies in the information presented to SRNAs (Bozimowski et al., 2014).

This literature review included studies examining the perceptions of impairment among anesthesia care providers, although concepts from similar healthcare disciplines were also included.

## **Perception of Substance Use Disorder**

### **Registered Nurses**

RNs' perceptions of SUD were ascertained in eight studies (Foli et al., 2019; Jackman et al., 2020; Kubayi, 2019; Kunyk, 2015; Matthias-Anderson & Yurkovich, 2016; Pecoraro et al., 2021; Trinkoff et al., 2021). In a qualitative-employed content analysis, Foli et al. (2019) found that RNs' ( $n = 250$ ) perceptions of SUD changed when they learned of a colleague's impairment. This altered perception was attributed to stigma and emotions such as sadness and grief. In Kubayi's (2019) study of 104 professional and enrolled nurses, 70.1% of respondents believed nurse impairment was a treatable illness, and 87.4% supported rehabilitation instead of punishment. However, 76.7% agreed that impaired nurses should be reported to their supervisor if suspected of substance-related problems.

Kunyk (2015) determined that 77% of RNs viewed nurse impairment as a treatable illness, and 98% of RNs believed employers and regulatory bodies should assist and maintain the confidentiality of impaired RNs. Kunyk concluded that with a more positive attitude, early identification, intervention, rehabilitation, and return to practice could be achieved in nursing.

Matthias-Anderson and Yurkovich (2016) studied social processes involved in the successful re-entry of impaired RNs into the workplace after SUD treatment. The researchers implemented a qualitative study with 22 RNs who had undergone SUD treatment and returned to work. The RNs responded that there were barriers to treatment and mentioned a lack of

education on SUD and discrimination. Participants also reported fear and shame as contributing factors to the delay in seeking treatment.

Pecoraro et al. (2021) explored RNs' perceptions of impaired colleagues, reporting practices, and knowledge of SUDs. The researchers used a mixed-method descriptive design and recruited 281 RNs from a state's nursing association (22% response rate) as a convenience sample. The findings showed that 99% of the participants disagreed with the statement, "there is little that can be done to help nurses who are impaired," and 98% agreed that state boards of nursing should offer referral sources to impaired nurses. Eighty-seven percent of the participants believed impaired nurses had an illness, and only 9% of participants thought it was due to a personality weakness. In contrast, 34% of participants believed impairment was related to work stress.

Trinkoff et al. (2021) asked RNs about their ability to recognize the signs of SUDs, their reporting behaviors, and their knowledge of SUD interventions. The study was part of a larger national nurse work life and wellness survey. The results demonstrated that over 75% of participants believed they could recognize signs of SUD in a colleague, but the participants self-efficacy varied by age and gender. More female participants (62%) were more likely to identify patient complaints of inadequate pain relief as a sign of nurse impairment than men. Despite 93% of RNs responding that they would report suspected impairment in a colleague, over half of the participants expressed worries about the colleague's punishment and job security (58.5%). Most RNs had favorable opinions of successful treatment and re-entry into the workplace (98.3%) and preferred supportive over punitive actions (85.6%).

According to a study by Thomas (2009), the majority of the 132 CRNA participants agreed that impaired CRNAs should be suspended (66%) and not allowed to return to work until



after completing a treatment program (67%). None of the CRNA participants believed an impaired CRNA could work while undergoing treatment. The majority of participants (79%) viewed SUD in CRNAs as an illness. The perceptions of CRNAs with previous encounters with impaired colleagues were similar to CRNAs without such experiences.

## **Student Learners**

### ***Nursing Students***

In a study examining the impact of SUD education on baccalaureate student nurses' perceptions of impaired colleagues, Boulton and Nosek (2014) used a two-group, pretest-posttest design and included 120 sophomore and junior baccalaureate nursing students. Thirty-three participants received an education intervention and 64 participants served as a control group. Fifty-seven percent of participants (57.7%) reported previous exposure to substance abuse. The study's results demonstrated that 88% of the participants favored not allowing an impaired nurse to work until the successful completion of a treatment program. Both groups of participants disagreed on the publication of impaired nurses' names, with the intervention group being more opposed than the control group. All participants believed that impairment is an illness. The researchers found that participants generally had positive perceptions of impaired nurses before the intervention, which became stronger (although not statistically significant) after the education.

Damewood et al. (2022) investigated the impact of integrated education on SUDs on baccalaureate nursing students' attitudes toward people with SUDs. The study used a pre- and post-study design and included 33 senior baccalaureate nursing students, with 11 completing the posttest. The results demonstrated that the pretest scores were higher ( $M = 48.9$ ) than the posttest scores ( $M = 39.9$ ), indicating that the students had more negative attitudes towards people with

SUD at the pretest stage further suggesting that attitudes toward people with SUDs can improve with SUD education.

Elliott et al. (2021) evaluated the impact of SUD education on nurse practitioner (NP) students' attitudes toward patients with opioid use disorders. Elliott et al. explained that a lower total mean score on the Drug and Drug Problems Perception Questionnaire (DDPPQ) indicated a more positive attitude toward individuals with opioid use disorder. The study found that pre-education scores ( $M = 79.2$ ) were higher than post-education scores ( $M = 64.0$ ), indicating that the NP students' attitudes were positively affected by education. In addition, the NP students reported changes in attitude following clinical practicum experiences during the curriculum. The resulting changes in attitudes further reinforced the belief that educational exposure led to a more favorable attitude toward people with opioid use disorders.

Lanzillotta-Rangeley et al. (2020) examined first-year baccalaureate nursing students' perceptions of people with SUDs. The researchers used a pretest and posttest design and assessed 198 first-year baccalaureate nursing students' perceptions of SUD. Study results demonstrated that stigma and bias were higher in the students before (55.1%) the educational presentation than after (43.8%) the educational presentation. Participants' answers to open-ended questions suggested they gained an increased sensitivity to patients in recovery. More than half of participants (53.5%) reported knowing someone who abused drugs or alcohol. Posttest scores indicated that most participants (58.5%) viewed SUD as a chronic disease, compared to only 27.3% of pretest scores suggesting that educational exposure can reduce stigma and bias toward people with SUDs.

Schuler and Horowitz (2020) observed that nursing students exposed to patients with SUDs through clinical practicum showed increased empathy and positive attitudes toward these

patients. The pre- and post-survey results demonstrated a significant improvement ( $p < .001$ ) in the students' empathy scores and attitudes. The students also reported that the practicum experience was more valuable than the lectures in reducing their fear of patients with SUD.

Williams et al. (2020) examined the effect of an educational video about SUDs on undergraduate and graduate nursing students' knowledge and attitudes of SUD. Of the 847 students enrolled in the nursing programs, 245 Associate of Science in nursing students (60%), 116 registered nurse-to-Bachelor of Science in nursing students (29%), and 45 Master of Science in nursing students (11%) participated in the study completing all components (48% participation rate). The researchers used the DDPPQ to evaluate the students' attitudes toward individuals with SUD. The results showed a significant improvement in the students' attitudes, with a mean score of 108.3 before and 119.8 after the intervention.

### ***Dental Hygiene Students***

Mitchell et al. (2018) noted that first-year dental hygiene students who underwent interprofessional education with undergraduate nursing students on the Screening, Brief Intervention, and Referral to Treatment (SBIRT) approach had improved attitudes toward SUD. The researchers measured participants' improved attitudes based on higher levels of role security after the education than before it, as measured by both the SBIRT and DDPPQ.

### ***Pharmacy Students***

Murnane et al. (2022) assessed attitudes toward addiction, opioid use, and overdose among 452 pharmacy students. The majority of participants (81.2%) agreed that addiction is a disease with a biological basis, but only 34.5% of participants would work in a pharmacy with a person having SUD. In addition, the study demonstrated a correlation between SUD education

and favorable attitudes, as attitudes improved while pharmacy students progressed through their pharmacy training.

### ***Social Work and Nursing Students***

O'Brien et al. (2019) studied the impact of both online patient simulation and in-person training on social work and nursing students' SBIRT attitudes, knowledge, and perceived skills (AKS). Results showed a significant improvement in participants' overall mean scores from pre-training ( $M = 3.16$ ) to post-training ( $M = 2.55$ ). Participants' attitude subset scores were lower in the post-training AKS scores (2.26) compared to the pre-training AKS scores (2.43), indicating a higher level of AKS.

Senreich et al. (2017) investigated the impact of SBIRT training on social work students' understanding and perception of substance use and substance users. SBIRT training was a part of in core courses in undergraduate ( $n = 136$ ) and graduate ( $n = 82$ ) social work students' core curriculum. The results demonstrated a significant increase in the total attitude scores from pretest ( $M = 80.71$ ) to posttest ( $M = 89.73$ ), supporting the effectiveness of incorporating SBIRT into social work education in promoting positive changes in students' knowledge and attitudes.

### **Physicians**

Geuijen et al. (2020) looked at the attitudes of 1,685 physicians in the Netherlands toward SUD and their intended approach toward colleagues who suffer from it. The results showed that most participants agreed that SUD was not a sign of weakness but was a treatable disease. The researchers also found that younger, female, resident-in-training physicians and physicians specializing in psycho-social medicine had more empathetic attitudes towards SUD.

May et al. (2002) investigated the attitudes of physician anesthesiologists toward addiction and its treatment. The results showed that anesthesiologists with a history of addiction

and anesthesiologists who regularly asked about SUD during preoperative interviews had more positive attitudes toward addiction and its treatment, similar to physicians specializing in addiction treatment. In contrast, physician anesthesiologists without personal history of addiction had less positive attitudes, possibly due to a lack of experience with SUD and addiction.

Pringle et al. (2017) evaluated the effect of incorporating SBIRT training into residency training programs on resident physicians' knowledge, skills, and attitudes regarding SBIRT and unhealthy alcohol and other drug use. The researchers assessed pre- and posttest scores for 365 residents. Results showed an overall improvement in residents' attitudes when treating patients with alcohol use disorder and SUD. The overall improvement in residents' attitudes suggest that incorporating SBIRT training into residency programs can be a valuable way to enhance resident physician competency and comfort when addressing substance use in clinical practice.

### **Attorneys and Physicians**

In Avery et al.'s (2020) study, researchers explored the beliefs of criminal defense attorneys and physicians regarding the brain disease model of addiction. The researchers found that most attorneys (52.4%) believed that addiction was a disease that removes choice, corresponding to a more positive attitude towards those with SUD. Although most physicians (62.5%) believed that addiction was a chronic, relapsing brain disease, physicians still maintained that people with SUD had a choice in using drugs. The researchers associated the physicians' belief of SUD as a choice with a more negative attitude and increased stigma. Nevertheless, only a small proportion of attorneys (0.6%) and physicians (1.7%) believed SUD was a moral lapse.

## **General Public**

In a public opinion survey, Barry et al. (2015) demonstrated that 29.5% of the 1,111 respondents reported personal experience with opioid use disorder through personal, family, or close friends' abuse. Participants with personal experiences with SUD attributed SUD to a lack of self-discipline, poor safe medication storage practices, and genetic disposition. Participants with personal experiences with SUD also agreed that opioids were prescribed for too long, were easily obtainable and that it was difficult to get health insurers to pay for non-medication pain treatments.

A study by Shreffler et al. (2021) compared mean scores from a 29-item survey examining the perception of SUD among patients in recovery ( $n = 111$ ), physicians ( $n = 113$ ), nurses ( $n = 206$ ), and medical students ( $n = 93$ ). Results suggested that patients in recovery ( $M = 3.97$ ) had a better understanding of the difficulty of recovering from SUD compared to physicians ( $M = 3.31$ ), nurses ( $M = 3.07$ ), and medical students ( $M = 3.40$ ). All groups believed that SUD recovery is a lifelong process and that there should be efforts to reduce the stigma associated with SUD. Among the study participants, medical students had a greater belief that healthcare providers treat SUD patients differently. Participants who identified as patients in recovery demonstrated a greater belief that medication was an effective treatment for opioid use disorder and should be prescribed to all people suffering from it.

## **Synthesis of the Evidence**

Based on the conducted literature review, the results demonstrate that healthcare providers who receive SUD education tend to believe SUD is an illness rather than a character flaw and demonstrate more tolerant attitudes toward people with SUD. Favorable attitudes were exhibited by physicians, registered nurses, student nurses, social work students, dental hygiene

students, attorneys, and the public, who were all less likely to exhibit stigma towards SUD when exposed to SUD, either personally or professionally. Additionally, a common theme was that most healthcare providers were not confident in their ability to recognize impairment among colleagues. Consequently, nurses reported feelings of disbelief or shock when a colleague's impairment was discovered, often accompanied by altered perceptions, indicating hidden stigma (Trinkoff et al., 2021).

### **Summary**

The literature review revealed that early exposure to the topic of SUD through the foundational curriculum is likely to increase knowledge and empathy while decreasing stigma towards SUD and those affected by it. In addition, the studies suggested that more exposure to SUD and people with SUD leads to more positive interactions and experiences. Positive interactions with people experiencing SUD can reduce bias leading to earlier recognition, intervention, and improved chances of successful recovery. However, there is a gap in the literature examining the relationship between demographic characteristics (age, gender, marital status) and personal and professional factors (highest educational degree, years in practice, practice setting, personal or professional experience with SUD) influence perceptions of peer impairment among NACPs.

Healthcare providers' attitudes and beliefs toward people with SUD, including interpersonal and institutional stigma can affect the quality of care provided to these patients (Elliott et al., 2021; Knaak et al., 2020; Lanzillotta-Rangeley et al., 2020). Education on SUD and personal or professional exposure to SUD can increase empathy and more favorable attitudes toward patients with SUD (Schuler & Horowitz, 2020). In addition, positive interactions between healthcare providers can improve communication and facilitate treatment assistance, leading to

improved health outcomes, increased workforce retention, and long-term recovery for people with SUD (Knaak et al., 2020). Chapter 2 was a review of the current literature exploring attitudes among healthcare providers and others toward individuals with SUD. Chapter 3 presents and describes the methodology employed in this research study.



## CHAPTER III

### PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The conducted study examined perceptions of nurse anesthesia provider impairment among those who received mandatory SUD education and those who did not receive SUD education. Additionally, the study explores the relationship between attitudes toward anesthesia care providers with SUD and various professional and personal participant characteristics. A more favorable attitude or increased tolerance of impaired nurses may correlate with an increased belief of SUD as a disease rather than a moral defect; hence, it was hypothesized that attitudes toward those with SUD will be more tolerant after receiving SUD education.

#### **Research Design**

The quantitative study used a cross sectional, descriptive, correlational design to examine the relationships between attitudes toward anesthesia care providers with SUD, education received during nurse anesthesia training, and various personal and professional characteristics. Dang et al. (2022) explained that cross-sectional studies examine outcomes and exposures from several distinct individuals at a single point in time. Researchers can observe or examine data collected in a cross-sectional manner without influencing or manipulating the variables of interest. Gray and Grove (2021) noted that descriptive, correlational studies can be used to examine the presence and magnitude of interrelationships among collected variables.

The central focus of this study was the different perceptions of provider impairment between anesthesia care providers who did or did not receive SUD education. Data collection occurred over a 21-day period in 2023. Recruitment of study participants occurred via email and snowball sampling through a closed social media group and asked participants to complete the *Perceptions and Attitudes of Substance Use Disorder Among Anesthesia Care Providers* survey

(see Appendix A). The survey included demographic questions (age, gender, race/ethnicity, marital status), personal, and professional factor questions (highest degree obtained, years of experience, clinical practice setting, and personal or professional experience with SUD) for grouping in addition to the 32-item PNII.

After the study's survey was created, it was distributed to six CRNA colleagues to gain an estimation of content requesting feedback regarding spelling, grammar, question flow, skip logic, and their overall opinion. While the overall feedback was positive, suggestions for improvement were made by the six CRNAs providing content expertise (Gray & Grove, 2021). Content expertise suggestions included corrections to the grammar, spelling, and punctuation as well as skip logic errors. All the suggested corrections were accepted.

## **Setting**

The setting for this study was the AANA member database. According to the AANA, there are an estimated 62,000 CRNAs and SRNAs nationwide and approximately 59,000 are members of the AANA (2021a). The AANA is a professional organization that represents almost 59,000 members across all 50 U.S. states, the District of Columbia, and Puerto Rico (AANA, 2021a). The AANA Foundation's Research and Quality Division maintains an active member database and offers an electronic survey service to foster and create a CRNA community of research (AANA, 2022c).

## **Population and Sample**

A recruitment email study was distributed from the AANA Research and Quality Division of the AANA Foundation to 3,000 randomly selected AANA members (see Appendix C). The participants recruited for this study were selected from the AANA member database (AANA, 2022c). There are three types of members within the AANA database, (a) certified:

passed exam within 2 years, practicing, voting member; (b) recertified: passed exam over 2 years ago, practicing, voting member; and (c) student: currently enrolled in a nurse anesthesia program. Member groups are categories used to determine AANA membership dues. Random selection of members was computer generated using numbers with a uniform distribution across the groups. Members who opted out of mass email communication from the AANA were excluded (see Appendix D). Additionally, the recruitment letter including the survey link was sent via email to the director of Diversity in Nurse Anesthesia and posted by the researcher in a closed social media group whose members are CRNAs or SRNAs.

The inclusion criteria for study participants included full-time enrollment in an accredited NAEP, a currently certified CRNA, or a recertified CRNA. All potential participants were at least 18 years old, had the ability to read and write in English and had access to a computer to complete the survey. Exclusion criteria included refusal to participate.

The study sample was generalizable to the greater population. A power analysis can determine the sample required to avoid committing Type II errors (Cohen, 1988). An effect size summarizes the strength of the relationship between variables. Therefore, a power analysis was conducted based on the expectations of a moderate effect size of .5 (*d*), given the desired  $\alpha$  level of .05 and a power of .8 (Buchner et al., 2007). The estimated sample size was calculated as 128 participants (see Appendix E).

Factors affecting sample size include effect size, population homogeneity, cooperation, and attrition. The population in this study is homogenous relative to education status and emotional intelligence (DeFord et al., 2019). Moreover, demographic data from the AANA show that members' ages range from 18-80 years, are mostly white/Caucasian race/ethnicity (80%), and female gender (60%; AANA, 2022a).

According to the AANA Electronic Survey Application, the average survey response rate is approximately 5% to 7% for typical research studies. However, the instructions note that recent response rates have declined to approximately 3%; therefore, cooperation may negatively affect the sample size (see Appendix D). An adequate sample size would be the G\*Power value (128 participants) plus 10% - 15% for data cooperation or attrition (12.8 participants). Therefore, the adjusted goal sample size was 142 participants.

### **Protection of Human Subjects**

Central to this research study is the demonstration of adherence to the fundamental principles of the Belmont Report. Approval for the research study was received from the Institutional Review Board (IRB) at Texas Woman's University (see Appendix F). Study participants were asked to agree to an electronic informed consent form explaining the details of their participation, including the right to withdraw at any time. The consent form was presented as the first question in the electronic survey (see Appendix G). Protection of participants' identities was assured as the AANA does not share the email addresses of the randomly selected members (AANA, 2022c). Additionally, the electronic survey manager removed the ability to collect email addresses or IP addresses from participants.

All research materials, including electronic consent forms, demographic information, and survey results were locked securely on a password-protected computer in a locked office. The link to the survey was shared in a closed Facebook group.

### ***Respect for Persons***

The autonomy principle justifies informed consent because people cannot act autonomously unless their decision-making is informed (Lo, 2020). Therefore, voluntary participation was requested from all potential participants. Furthermore, confidentiality was

maintained using a separate link to a secondary survey at the conclusion of the primary survey to collect email addresses for the purpose of incentive awards. The information collected in the primary survey and the email addresses collected in the secondary survey link were kept separate and no other identifying information was collected in the secondary survey. Finally, the participants in this study do not represent a vulnerable population.

### ***Justice***

The principle of justice in research relates to the fair treatment of study participants in ethical research and includes the right of the participant to decline to participate or withdraw from the research study at any time (Barrow et al., 2021; Panter & Serba, 2011).

The study participants in the current study were treated equally. Graduates of undergraduate nursing programs are required to possess a level of English-language fluency (AACN, 2020). Students enrolled in NAEPs in the US must demonstrate comprehension of the written and spoken English language either as their native language or by providing results from the Test of English as a Foreign Language prior to admission, as NAEPs use teaching and learning methods delivered in English (COA, 2023). All study material was delivered in English-language format.

### ***Beneficence***

The ethical principle of beneficence requires that clinical research is scientifically sound to yield a potential benefit to participants (Lo, 2020). Benefits to the participants included an increased awareness of personal perceptions of nurse anesthesia provider impairment. However, potential harm may include accidental exposure of demographic information related to a participant's history of personal substance abuse.

### ***Informed Consent Process***

The recruitment letter describing the research study was distributed from the AANA Research and Quality Division of the AANA Foundation to 3,000 randomly selected AANA members, via direct email communication to the director of Diversity in Nurse Anesthesia and posted in a closed social media site. The electronic consent was on the first page of the survey, and the invitation recipient had to voluntarily participate in the study before being allowed to continue to the survey (see Appendix G).

### **Instrument**

Web-based electronic surveys are an economical way to collect data from a large group. The electronic survey designed for this study consisted of 55 items, including the informed consent, demographic questions, questions about education, clinical practice setting, personal or professional experience with SUD, and the 32-item PNII. The first question was the informed consent. The consent form explained the purpose of the research and the potential risks of electronic communication; it also gave a description of the survey and provided the researcher's contact information. The consent explained the voluntary nature of participation and the option to withdraw from the study survey at any time. No information was stored, so if the participant exited before finishing the survey, there was no mechanism to open the survey and continue at that stopping point. If the participant selected "yes" and agreed to participate, they were routed to the next question which began a series of demographic questions. If the participant selected "no" and did not consent to participate, they were routed to the end-of-survey statement, thanked for their time, and their survey closed. Some questions required an answer to proceed to the following question, while others did not require an answer. Questions consisted of single-answer-multiple choice, multiple-answer-multiple choice, and fill in the blank responses.

The second to last question allowed the participant an opportunity to share any personal or professional experiences with impairment. Participants were invited to add any additional information they felt would be useful to the research study. The last question concerned the opportunity to be placed into a gift card drawing. A description explained that by selecting “yes,” the participant was redirected to a separate survey that asked them to enter their email. If they selected “no,” they were routed to the end-of-survey message and the survey closed.

The data collected from the secondary survey was downloaded onto an Excel spreadsheet. Numbers corresponding to the participants’ email address were placed into a sequence generator (Random.org, 2023). The first five numbers generated represented the winning participants’ email addresses and each was sent a \$100 Amazon gift card.

### **Demographic Questionnaire**

Demographic information including age, gender, race/ethnicity, and marital status, was collected to examine relationships between the IVs and the DV, perceptions of nurse impairment.

### **Perceptions of Nurse Impairment Inventory**

Hendrix et al. (1987) developed the PNII as part of The University of Kentucky College of Nursing’s *Nurses Assisting Nurses* project. The PNII is a 32-item survey using a Likert-type scoring system. Factor analysis was performed on the original questionnaire and showed nine components describing attitudes toward nursing impairment. The PNII was operationalized in this study to assess nurse anesthesia providers’ perceptions of impaired colleagues. Hendrix et al. (1987) developed and used this questionnaire to determine attitudes toward impairment, specifically within the field of nursing. Hendrix et al. (1987) noted that while attitudes of impairment had been measured in numerous studies, none had been geared toward a specific profession. Additionally, different versions were created to differentiate perceptions of

impairment according to different categories of substance used (e.g., alcohol use, drug use, both alcohol and drug use). The different versions used alternative definitions of the term *impairment* according to the specific type of substance being assessed. The nine subscales that Hendrix et al. (1987) developed are as follows:

1. *Perception of Recognizability*: The perception of recognizability examined the ability to detect impairment using behavioral or physical indicators, and whether the impairment is likely to be reported. The recognizability factor included two items (23, 24) in the survey.
2. *Orientation to Impairment as Illness*: The characterization of SUD as a disease or illness, rather than a moral flaw or ethical deficiency is what the orientation to impairment as an illness measured. The survey included two items (25, 26) that gauged the belief of impairment as an illness.
3. *Perception of Prevalence*: The perception of prevalence sought to understand the belief that impairment in the nursing profession is a significant pervasive problem. Two items (27, 28) on the survey addressed the perception of prevalence.
4. *Distinctiveness to Nursing*: The distinctiveness to nursing is a concept that referred to the belief that impairment is specific to the contextual features of the life and work of nurses. Four items (29, 30, 31, 32) included in the survey assess participants' beliefs that impairment is distinct to nurses.
5. *Orientation to Helping Responsibility within the Profession*: The orientation to helping responsibility within the profession factor centers on the belief that the responsibility of assisting an impaired nurse rests with the nurse's colleagues, supervisors, and regulatory agencies, such as state boards of nursing. The



responsibility of the profession to help impaired nurses is assessed by six questions in the survey (33, 34, 35, 36, 37, 38).

6. *Treatability Orientation*: Trustworthiness and productivity of the impaired nurse after treatment is the focus of the treatability orientation factor. The survey included three items (39, 40, 41) applicable to the treatability of nurse impairment.
7. *Orientation to the Nurse Anesthesia Provider's Ability to Help*: The orientation to the nurse's ability to help is the factor suggesting the belief that impaired nurses can be assisted by other nurses because nurses understand the professional nuances. The nurse anesthesia provider's ability to help an impaired nurse was assessed by four survey items (42, 43, 44, 45).
8. *Orientation to the Need to Know*: The need-to-know concept suggests the belief that peers, supervisors, and colleagues should be made aware of any suspicion of impairment or disciplinary action on a nurse's license related to impairment. Three items (46, 47, 48) on the survey addressed participants' belief that impaired nurses' possible impairment should be disseminated to the public.
9. *Disciplinary Orientation*: Six questions (49, 50, 51, 52, 53, 54) included in the survey pertained to the orientation to disciplinary action against an impaired nurses' employment or licensure status.

Participants were asked to respond to the 32 PNII items by selecting one of four choices based on the extent to which they agreed with the statement provided. Answer choices consisted of the following: (a) *strongly agree*, (b) *agree*, (c) *disagree*, and (d) *strongly disagree*. The PNII uses a 4-point Likert-type scoring scale, with answers of *strongly agree* scored with a 1, and answers of *strongly disagree* scored with a 4. Lower total scores were reflective of a more

tolerant attitude toward impairment in nurses, or rather a higher level of acceptance of SUD as an illness in these providers.

The data obtained from a Likert scale survey are considered an ordinal level of measurement. However, when the summed scores of the Likert scales are used for analysis, those scores represent interval-level measurement. The basis for allowing Likert scales to function at the interval level of measurement is supported since these scores represent the magnitude of the attribute being measured (Kellar & Kelvin, 2013; Norman, 2010; Waltz et al., 2017).

### ***Reliability***

The reliability of an instrument refers to the extent to which questions or survey items fit together termed internal consistency (Kellar & Kelvin, 2013). The range for Cronbach's  $\alpha$  is between 0 and 1, with a higher value indicating increased reliability (Pallant, 2016). Hendrix et al. (1987) reported that the Cronbach's  $\alpha$  coefficient was  $\alpha = 0.82$  for the 32-item instrument. Additionally, each Cronbach's  $\alpha$  for the different versions containing the different definitions of substance abuse was reported as  $\alpha \geq .80$ . Subscale reliability was not reported.

### ***Validity***

Quantitative research studies infer that there is an IV and a DV, and the resulting change in the DV is due to manipulation of the IV. Internal validity refers to the belief that it is the IV and not an outside factor that caused the outcome of the study (Polit & Beck, 2021). Threats to the internal validity of a study vary according to the research design. Frequently encountered threats include temporal ambiguity, selection, history, maturation, mortality/attrition, and testing/instrumentation. The PNII has been used in over 60 research studies within 5 years after its development reflecting the instrument's face validity (Gray & Grove, 2021; Pecoraro et al., 2021).

Experimental studies that include test and control groups are more susceptible to threats of history, mortality/attrition, and testing/instrumentation (Polit & Beck, 2021). The threat of history to internal validity concerns external occurrences that may affect the study outcomes, which may involve having a personal history of SUD (an IV that was analyzed in this study).

External validity refers to how or if a research study's results can be generalized for a population (Gray & Grove, 2021). The sample chosen for this research study is representative of the population of nurse anesthesia care providers. The study participants were randomly selected from the AANA member database and include (a) certified: passed exam within 2 years, practicing, voting member; (b) recertified: passed exam over 2 years ago, practicing, voting member; and (c) student: currently enrolled in a nurse anesthesia program. Therefore, this research was generalizable to all nurse anesthesia care providers.

### ***Permission to Use***

In October 2022, permission to use and modify the PNII was sought from the University of Kentucky, Associate Dean for Research and PhD Faculty Affairs. The instrument was developed for the *Nurses Assisting Nurses* project at the University of Kentucky College of Nursing in 1987 by Dr. Melva Hendrix. Dr. Hendrix has since died, so permission to use and modify the tool was obtained from the University (see Appendix H). Modifications were made to update the language from he/she and his/her to they/them to reflect more bias-free, gender-neutral language. Additionally, minor grammar and punctuation edits were made, and the word “nurse” was replaced with “nurse anesthesia provider.”

### **Data Collection Procedures**

Analysis of the data collected in this study examines the relationships between receiving SUD education, personal and professional factors, and attitudes toward anesthesia care providers

with SUD. Data was collected using Qualtrics, an Internet-based research platform. The AANA Research & Quality Division offers both full-service and tool deployment-only options for electronic surveys (AANA, 2022c). The recruitment email detailed the study, the benefits, and risks to the participant and contained the link to the electronic survey (see Appendix B).

### **Pilot Study**

A pilot study was conducted in February 2023 to provide guidance for a substantive study. Using the sample selection described above, a recruitment email was sent from the AANA to 150 members of the AANA membership database. A second reminder email was sent from the AANA to the same 150 member emails two weeks after the initial recruitment email. Data was collected over 3 weeks resulting in 12 responses (8% response rate).

Twelve respondents consented to participate in the survey. One of the initial 12 participants opened the survey but answered no questions. One participant answered only the demographic questions. The data from these incomplete surveys were not used for analysis, resulting in a final response rate of 6.6%. One participant did not answer three questions on the PNII, so the mean score of each item was calculated and used for that participant's missing data. The average time to complete the survey (13.8 minutes) was calculated after removing two outliers from the remaining 10 participants' data. Reliability of the total PNII used for this pilot study was calculated as Cronbach's  $\alpha = .651$ . Reliability is strongly influenced by the sample size related to the number of survey items, number of items on the individual subscales and the heterogeneity of the sample (Polit & Beck, 2021). The original sample size used by Hendrix et al. (1987) was 1,047, resulting in a Cronbach's  $\alpha = .82$ .

Analysis of the pilot study data revealed that most participants (70%) identified as women and nearly all identified as white (90%), which is reflective of the overall demographic

distribution of CRNAs and SRNAs (50% and 80%, respectively; AANA 2022a). All of the participants identified as CRNAs. Half of the participants reported graduating from their NAEPs in 2011 or before. A small proportion of respondents (20%) reported working as full-time nurse anesthesia educators, and the remaining respondents reported being full-time clinical providers in various practice arrangements. Nearly half of the respondents (40%) reported a doctoral degree as their highest level of education. All participants responded receiving SUD education in their NAEP programs. Two participants (20%) reported a personal history of SUD; one participant reported alcohol as the substance abused while the other reported both alcohol and drugs. Sixty percent of participants reported having experience with an impaired work colleague, while 80% had a friend or relative with SUD. The pilot study grouped age and years of RN experience as nominal variables. However, to capture accurate mean values for age and clinical practice years, those items were changed to request actual age and years rather than categories of each item.

The mean score obtained from the PNII was 71.44 ( $SD = 6.450$ ), with a range of 58-81 (23). The Fisher's measure of skewness was  $-.723$  ( $SE = 0.687$ ) and kurtosis was  $1.085$  ( $SE = 1.334$ ) indicating a relatively normal distribution. Tests of normality show a Kolmogorov-Smirnov significance value of  $.154$  ( $p > .05$ ) indicating a normal distribution. However, due to the small sample size, little can be inferred from these data. Therefore, only descriptive analyses were conducted on the pilot study data. During data analysis, it was discovered that one question from the 32-item PNII was inadvertently omitted. The same item was omitted in studies conducted by Kunyk (2015) and Beckstead (2002). A potential reason for the omission is that Hendrix et al. (1987) omitted this question in their description of each factor.

The use of positively and negatively worded items in research instruments is a common practice aimed at reducing response bias (Suárez-Alvarez et al., 2018). However, the practice

may negatively affect the instrument's validity and reliability. Additionally, survey fatigue and confusion can affect survey scores when using negatively worded survey statements with Likert-type response scales (Chyung et al., 2018). Several studies using the PNII discussed reverse coding for negatively worded items but did not identify which items were reverse coded. Hendrix et al. (1987) did not describe reverse-coded items. After further discussion via email correspondence with The University of Kentucky seeking the original study materials including a codebook, none were in the archives. However, closer evaluation of each item in the PNII reveals 11 items should be reverse coded (26, 28, 39, 40, 45, 48, 49, 51, 52, 53, 54), as agreeing with these statements reflects a low level of empathy toward an impaired peer, or a lack of understanding of SUD as an illness.

Implementation of the pilot study was straight-forward with planned revisions including reverse coding items, inclusion of the omitted survey item, and including snowball sampling to increase the number and diversity of study participants. One avenue to increase diverse NACP participation included sharing the direct survey link with an organization aimed at increasing the overall diversity in the nurse anesthesia profession (Diversity in Nurse Anesthesia, 2018). The Center for Behavioral Health Statistics and Quality (CBHSQ, 2021) presented annual average estimates for SUD among people aged 12 and older in the following races/ethnicities: white, black, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, Asian, Hispanic, and people who report two or more races. Examining data presented for the years 2015 through 2019, the CBHSQ (2021) reported American Indian or Alaska Native people had the highest estimated SUD (11.2%) compared to people reporting two or more races (9.9%), White (7.8%), Black (7.1%), Hispanic (7.1%), and Asian (4.1%). Additionally, although in 2018, only 18% of those identified as needing SUD treatment received treatment, the gap is much greater for Black

and Hispanic/Latinx people (Cruz, 2021). Data from the CBHSQ (2021) support the need to increase the perspectives of SUD and lived experiences of all racial/ethnic groups.

### **Treatment of Data**

The pilot study used a PsychData survey for data collection. PsychData uses Secure Socket Layer (SSL) 256-bit encryption technology to protect all data transactions on their website. The data is encrypted when the user submits it and can only be decoded by the target server. Statistical analyses for the data collected were conducted using the IBM Statistical Package for Social Services (SPSS; Version 28.0.1.0). The information collected in the pilot study via the primary and secondary surveys were kept separate and no identifying information except for email address was collected in the secondary survey.

Due to contractual changes at the university system level, data for the substantive study was collected using Qualtrics, an Internet-based research platform. Qualtrics uses Transport Layer Security encryption, also known as HTTPS, for all transmitted data.

All research materials, including electronic consent forms, demographic information, and survey results were locked securely in a password-protected computer in a locked office.

### **SUD Education on the Perception of Nurse Impairment**

To analyze if there was a difference between the mean scores of two independent groups on a continuous DV, the study employed an independent *t*-test. Dependent variable data collected (perceptions of nurse anesthesia provider impairment) was at the ordinal level of data, but when the items were summed, the level of measurement increased to interval. The IV (SUD education) consisted of two dichotomous groups, those participants who received or had not received SUD education. Before computing the assumptions for an independent *t*-test, descriptive statistics including mean, standard deviation, median, minimum, maximum,

skewness and kurtosis, were calculated. Analyses were conducted that examined the influences of the quality and quantity of SUD educational content on the perceptions of nurse anesthesia provider impairment.

### **Demographic Characteristics and Attitudes Toward Peer SUD**

To determine if there were relationships between the demographic IVs including age, gender, race/ethnicity, and marital status and the continuous DV, perceptions of nurse anesthesia provider impairment, a standard multiple regression analysis was performed. Before computing the assumptions for standard multiple regression, descriptive statistics were calculated.

### **Personal and Professional Factors and Attitudes Toward Peer SUD**

To determine if relationships exist between the personal and professional IVs including highest educational degree, years of experience, clinical practice setting, and personal or professional experience with SUD and the continuous DV, perceptions of nurse anesthesia provider impairment, a standard multiple regression analysis was conducted. Before computing the assumptions for a standard multiple regression analysis, descriptive statistics were obtained.



## CHAPTER IV

### ANALYSIS OF DATA

Studies report that SUD among healthcare providers is as high as 15% to 20% (Bartlett et al., 2013; Dolezal & Lyons, 2017; Luck & Hedrick, 2004). These same studies suggest that there remains considerable bias and stigma towards those suffering from or recovered from SUD. Stigmas may lead impaired providers to try to overcome this problem alone rather than seek treatment. The purpose of this study was to determine the relationships between SUD education, demographics, and personal and professional factors on NACPs' attitudes and perceptions toward impairment among their colleagues.

#### **Description of the Sample**

##### **Setting**

The study's setting was the AANA membership database. A random selection of members for this study was computer-generated using numbers with a uniform distribution across the groups. Members who opted out of mass email communication from the AANA were excluded (see Appendix D).

An email invitation was sent to 3,000 AANA members within the database to participate in the study. Additionally, in an effort to increase the diversity of study participants, the recruitment email including the survey link was posted by the researcher in a closed Facebook forum whose members had to provide documentation of their status as a CRNA or SRNA and directly sent to the director of Diversity in Nurse Anesthesia. The survey remained open for 21 days.

## Participant Demographics

Of the 3,000 invitations sent from the AANA, 224 NACPs consented to participate in the research study. Of those 224 NACP who consented to participate in the study, 192 completed the survey questions. A power analysis determined that the sample required to avoid committing Type II errors was 128 participants (see Appendix E). An effect size summarizes the strength of the relationship between variables (Cohen, 1988). The power analysis was conducted based on the expectations of a moderate effect size of .5 (*d*), given the desired  $\alpha$  level of .05 and a power of .8 (Buchner et al., 2007). According to the AANA Electronic Survey Application, the average response rate to surveys has declined from 5% - 7% to approximately 3% (see Appendix D). Since cooperation may negatively affect the sample size, 10% - 15% of the calculated sample was added resulting in a goal of 142 participants, which was achieved.

Demographic characteristics of the 192 participants who completed the survey were analyzed and can be found in Table 1. The average time to complete the survey was 13.1 minutes after removing four outliers. The age range of participants was 25 to 71 years old ( $M = 47.1$ ). Over half of the participants (58.3%) were women. An overwhelming majority of participants (87.5%) reported their race/ethnicity as Caucasian ( $n = 168$ ). One hundred forty-four participants were married or partnered (75.0%), 19 were divorced (9.9%), and 29 were single (15.1%). Most participants received SUD education in their NAEP programs (72.9%), with 53.6% indicating 1 to 4 hours ( $n = 103$ ), 10.9% indicating less than 1 hour ( $n = 21$ ), and 8.3% indicating more than 4 hours of content ( $n = 16$ ). Out of the 140 participants who received SUD education in their NAEP only 19.3% were required to take a competency assessment ( $n = 37$ ).

The professional characteristics of the participants, such as highest educational degree, employment arrangement, practice setting, and their history or exposure to colleague's SUD are listed in Table 2. Most participants ( $n = 169$ ) reported being CRNAs (88.0%), while 23 were SRNAs (12.0%). The majority of the CRNA participants ( $n = 117$ ) reported graduating from their NAEPs in 2011 or before (69.2%). A small proportion (10.4%) reported working as full-time nurse anesthesia educators, with the remaining as part-time or full-time clinical providers in various practice arrangements. Over half (52.1%) reported a master's degree as their highest level of education, while 33.3% reported doctoral preparation.

Seventy-six percent of participants reported having encountered impairment with a colleague, while 70.8% had a friend or relative with SUD. Twelve participants (6.3%) reported a personal history of SUD, with eight reporting either drugs or both alcohol and drugs as the substance(s) abused. The most prevalent substance abused among this study's participants was opioids (58.3%), alone or in combination with other drugs or alcohol. This finding is similar to previous studies' findings of opioids as the substance of choice among anesthesia providers (Bozimowski et al., 2014; Bryson & Silverstein, 2008; Wright et al., 2012).

## **Findings**

The study used Qualtrics, an Internet-based research platform to collect data for analysis. At the end of the survey period, data were downloaded from Qualtrics to IBM SPSS Statistics (Version 28.0.1.0). First, the file was prepared by assessing for missing data, labeling the variables, and coding each item. Next, descriptive statistics were calculated, including mean, standard deviation, median, minimum, maximum, skewness, and kurtosis for the sample. Then assumption testing was performed for an independent  $t$ -test, before lastly computing the

inferential statistics. The descriptive statistics, results of the assumption testing, and inferential statistics are presented in this chapter and further discussed in Chapter 5.

### **Reliability of the PNII**

Reliability coefficients for the overall and subscales of the PNII were obtained to verify internal consistency for this study and then reliability analysis was conducted. Reliability of the total PNII was calculated as Cronbach's  $\alpha = .710$ , indicating an acceptable level of internal consistency (see Table 3). Additionally, each subscale was evaluated and Cronbach's  $\alpha$  for each scale is listed in Table 3. Cronbach's  $\alpha$  values indicate varying levels of subscale internal consistency.

### **SUD Education on Peer Perception of Nurse Impairment**

To analyze whether there was a difference between two independent groups on a continuous DV, this study employed an independent  $t$ -test. Data for the DV (i.e., perception of nurse impairment) were collected at the ordinal level of data, but when the items were summed, the variable measurement increased to interval level. The IV consisted of two dichotomous groups, those who received or did not receive SUD education.

### ***Descriptive Statistics***

Before computing the assumptions for an independent  $t$ -test, descriptive statistics were calculated. The descriptive statistics included mean, standard deviation, median, minimum, maximum, skewness and kurtosis. As depicted in Table 4, mean and median were equidistant, without significant skewness. Kurtosis was noted to be  $-.501$ , indicating a relatively flat (platykurtic) distribution.

### *Assumptions*

There are six assumptions that must be met before any researcher can calculate an independent  $t$ -test. The identification of the six assumptions for an independent  $t$ -test, an explanation of how each assumption was tested, and the results determining if the assumption was met or not are described below.

The first assumption was that the DV must be measured at the interval or ratio level of measurement. The first assumption was met by the intended design. In this case, the DV, perception of nurse impairment, was measured at the interval level of measurement. Therefore, the assumption was met.

The second assumption was that the IV must be measured by two categorical groups at either the nominal or ordinal level of measurement. In this case, the IV (SUD education) is dichotomous (yes/no) and measured at the nominal level of measurement. Therefore, the assumption was met.

The third assumption was that there must be independence of observations. For the independence of observation assumption to be met, each observation must only exist in one of the groups, not both. In this study, either the participants received SUD education, or they did not. Therefore, the observations were independent, and the assumption was met.

The fourth assumption was that there should be no significant outliers. This assumption was tested by commuting box and whisker plots using the Exact analysis process. As depicted in Figure 1, there were no outliers.

The fifth assumption was that the data for each group of the IV on the DV must be normally distributed. To test for this assumption, the Shapiro-Wilk test was calculated for each

IV. Engagement scores were normally distributed, as assessed by the Shapiro-Wilk test ( $p > .05$ ) (see Table 5).

Because the Shapiro-Wilk test is not stable in larger samples ( $>$  than 30 participants), the Q-Q plots and the histograms with superimposed normalcy curve were also analyzed. The histogram with normalcy curve showed that the standardized residuals were approximately normally distributed. Therefore, this assumption was met.

The final assumption was that there should be homogeneity of variances. To test whether there was equality of variances of the DV in each group of the IV, the Levene's test was calculated. Based on the results of the Levene's test ( $F = .149$ ,  $p = .700$ ), the assumption was met.

## **Results**

An independent-samples  $t$ -test was conducted to determine differences in perceptions of nurse impairment between NACPs who did or did not receive mandatory SUD education (see Table 1). No outliers were noted in the data, as assessed by the Shapiro-Wilk test ( $p > .05$ ), and there was homogeneity of variances, as assessed by Levene's test for equality of variances ( $F = .149$ ,  $p = .700$ ). The perceptions and attitudes were more positive in NACPs who received SUD education ( $M = 62.44$ ,  $SD = 7.124$ ) than in those who did not ( $M = 64.17$ ,  $SD = 6.919$ ). However, there was no statistically significant difference between the two groups  $M = -1.730$ , 95% CI  $[-3.995, .534]$ ,  $t(190) = -1.507$ ,  $p = .133$ , two-tailed. The magnitude of the differences in the means (mean difference =  $-1.730$ , 95% CI:  $-3.995$  to  $.534$ ) was small (Cohen's  $d = 0.24$ ).

Therefore, for the study's first research question: "How does mandatory SUD education in nurse anesthesia educational programs impact peer attitudes toward SUD among anesthesia

care providers?” the results failed to show a statistical impact of SUD education on peer attitudes toward impairment among nurse anesthesia providers.

### **Demographic Characteristics and Peer Perception of SUD**

To determine if there was a relationship between the DV (peer perception of SUD) and the predictor variables, a standard multiple regression was performed. The predictor variables consisted of demographic factors including age, gender, race/ethnicity, and marital status.

#### ***Descriptive Statistics***

Before computing the assumptions for standard multiple regression, descriptive statistics were calculated. The descriptive statistics included mean, standard deviation, median, minimum, maximum, skewness, and kurtosis. As depicted in Table 4, mean and median were equidistant, without significant skewness. Kurtosis was noted to be  $-.501$ , indicating a relatively flat (platykurtic) distribution.

#### ***Assumptions***

The eight assumptions that must be met before performing standard multiple regression are listed below and include a description of how the assumption was tested, followed by the results and the determination whether the assumption was met or not.

The first assumption was that the DV must be measured at the interval level of measurement. The first assumption was met by the intended design. In this case, the DV (perception of nurse impairment) was measured at the interval level of measurement. Therefore, the assumption was met.

The second assumption was that there are two or more predictor variables that are measured at either the continuous or nominal level of measurement. In this case, three predictor variables (gender, race/ethnicity, and marital status) were measured at the nominal/categorical

level of measurement, and one (age) was measured at a ratio/continuous level of measurement. Therefore, the assumption was met.

The third assumption was that of independence of observations. To meet this assumption, there must be no correlation between the predictor variables. This assumption was tested by running the Durbin-Watson statistic. As assessed by a Durbin-Watson statistic of 1.865, there was independence of residuals. Therefore, this assumption was met (see Table 6).

The fourth assumption was the need for a linear relationship between the DV and each of the predictor variables. Additionally, there needs to be a linear relationship between the DV and the predictor variables, collectively. The assumption of linearity was tested in two parts. First, a scatter plot of studentized residuals was plotted against the predicted values (see Figure 2); and second, partial regression plots between each predictor variable and the DV were obtained (see Figures 3, 4, 5, and 6). Consequently, this assumption was met.

The fifth assumption was that the data needed to show homoscedasticity of residuals. The test assessing homoscedasticity of residuals was conducted by assessing the scatterplot created to check linearity (see Figure 2). There was evidence of homoscedasticity as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values. Therefore, this assumption was met.

The sixth assumption was that the data must not show multicollinearity or correlation among the predictor variables. Correlation coefficients and Tolerance/VIF values were inspected to test whether the data showed multicollinearity. All correlation values were less than 0.7. All Tolerance values were greater than 0.10, and the values of VIF were all under 10 (see Table 7). Based on these values, multicollinearity is not present. Therefore, this assumption was met.



Assumption seven stated that there should be no significant outliers, high leverage points or highly influential points. This assumption was tested by examining the Casewise diagnostics for standardized residuals for outliers. There were no values greater than  $\pm 3$ , which would indicate a relevant outlier. The data were also checked for leverage points. All leverage values were less than 0.2, indicating safe values. Lastly, data were examined for influential points by reviewing Cook's Distance. None of the Cook's Distance values were above 1, therefore no influential points were noted evidencing that the assumption was met.

The final assumption was that the residuals should be approximately normally distributed. The Q-Q plot and the histogram with the superimposed normalcy curve were inspected to test the assumption of normally distributed residuals (see Figure 7). The histogram with normalcy curve showed that the standardized residuals were approximately normally distributed, with the mean and standard deviation values of approximately 0 (zero) and 1, respectively; therefore, this assumption was met.

## ***Results***

Multiple regression analysis was conducted to predict perceptions of nurse impairment from age, gender, race/ethnicity, and marital status. Linearity was assessed by examining partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals as assessed by a Durbin-Watson statistic of 1.863. There was homoscedasticity as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than  $\pm 3$  standard deviations, no leverage values greater than 0.2, or Cook's distance values above 1. The assumption of normality was met as assessed by a Q-Q plot.  $R^2$  for the overall model was 6.5%

with an adjusted  $R^2$  of 4.5%. The multiple regression model failed to show statistically significantly predicted perceptions of nurse impairment,  $F(4, 185) = 3.220$ ,  $p = .014$ , adj.  $R^2 = .045$  (see Table 8). None of the four variables added statistical significance to the prediction,  $p < .0005$ . Regression coefficients and standard errors for the demographic characteristics can be found in Table 9. The model, which included gender, ethnicity/race, marital status, and age, explained 4.5% of the variance in perceptions of nurse impairment. However, of these four variables, age made the largest unique contribution ( $\beta = .218$ ).

Therefore, for the study's second research question: "What demographic factors (age, gender, race/ethnicity, marital status) correlate to a more tolerant attitude toward SUD in anesthesia care providers?" the results failed to show statistically significant predictions of demographic factors and tolerant attitudes toward impairment among nurse anesthesia providers.

### **NACP Perception of SUD and Personal or Professional Factors**

A standard multiple regression analysis was conducted to determine if relationships exist between the predictor variables and a continuous DV. The predictor variables for this model consisted of personal and professional factors including highest educational degree, years of experience, clinical practice setting, and personal or professional experience with SUD.

#### ***Descriptive Statistics***

Before computing the assumptions for standard multiple regression, descriptive statistics were calculated. As depicted in Table 4, mean and median were equidistant, without significant skewness. Kurtosis was noted to be  $-.501$ , indicating a relatively flat (platykurtic) distribution.

### *Assumptions*

There were eight assumptions that must be met before standard multiple regression can be performed. These assumptions are listed, along with how the assumption was tested, followed by the results and the determination whether the assumption was met.

The first assumption was that the DV must be measured at the interval level of measurement. The first assumption was met by the intended design. In this case, the DV, perception of nurse impairment, was measured at the interval level of measurement. Therefore, the assumption was met.

The second assumption was that there are two or more predictor variables that must be measured at either the continuous or nominal level of measurement. In this case, the predictor variables highest educational degree (ordinal), clinical practice setting (nominal), and personal (both personal history and experience with a friend or relative), or professional (experience with a colleague) with SUD (nominal) were measured at the categorical level. Although the highest educational degree was measured at the ordinal level, this variable was treated as nominal data for the purpose of multiple regression analysis. The predictor variable, years of experience, was measured at the interval/continuous level of measurement. Therefore, the assumption was met.

The third assumption was that of independence of observations. For this assumption to be met, there must be no correlation between the predictor variables. This assumption was tested by running the Durbin-Watson statistic. As assessed by a Durbin-Watson statistic of 1.952, there was independence of residuals, therefore, this assumption was met (see Table 10).

The fourth assumption was the need for a linear relationship between the DV and each of the predictor variables, and the DV and the predictor variables, collectively. The assumption of linearity was tested in two parts: first, a scatter plot of studentized residuals was plotted against

the predicted values (see Figure 8), and second, partial regression plots between each predictor variable and the DV were obtained (see Figures 9–14). Consequently, this assumption was met.

The fifth assumption was that the data need to show homoscedasticity of residuals. Scatter plots were examined to check linearity to test for homoscedasticity of residuals (see Figure 8). There was homoscedasticity as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values; therefore, this assumption was met.

The sixth assumption stated that the data must not show multicollinearity or correlation among the predictor variables. The correlation coefficients and Tolerance/VIF values were examined to test whether the data showed multicollinearity. All Tolerance values were greater than 0.10, and the values of VIF were all under 10. Based on these values, multicollinearity was not present; therefore, this assumption was met.

Assumption seven was that there should be no significant outliers, high leverage points or highly influential points. This assumption was tested by examining the Casewise diagnostics for standardized residuals for outliers. No values greater than  $\pm 3$ , which would indicate a relevant outlier, were noted. The data were also checked for leverage points. All leverage values were less than 0.2, indicating safe values. Lastly, data were examined for influential points by reviewing Cook's Distance. None of the Cook's Distance values were above 1. Therefore, no influential points were noted, evidence that the assumption was met.

The final assumption was that the residuals should be approximately normally distributed. The Q-Q plot and histogram with the superimposed normalcy curve were inspected to test for the assumption of normally distributed residuals (see Figure 15). The histogram with normalcy curve showed that the standardized residuals were approximately normally distributed,

with the mean and standard deviation values of approximately 0 (zero) and 1, respectively; therefore, this assumption was met.

## ***Results***

A multiple regression analysis was conducted to predict perceptions of nurse impairment from highest educational degree, years of experience, clinical practice setting, and personal or professional experience with SUD. Linearity was assessed by the partial regression plots and a plot of studentized residuals against the predicted values. Independence of residuals was assessed by a Durbin-Watson statistic of 1.952. Homoscedasticity was assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. Additionally, there was no evidence of multicollinearity as assessed by tolerance values greater than 0.1. No studentized deleted residuals greater than  $\pm 3$  standard deviations, no leverage values greater than 0.2, and no values for Cook's distance above 1 were noted. The assumption of normality was met as assessed by a Q-Q plot. The multiple regression model did not reach statistically significantly predicted perceptions of nurse impairment,  $F(6, 165) = 1.511$ ,  $p = .178$ , adj.  $R^2 = .018$  (see Table 12). None of these five variables added statistical significance to the prediction. Regression coefficients and standard errors for the demographic characteristics can be found in Table 13. The model, which included personal and professional factors, explained 5.4% of the variance in perceptions of nurse impairment. Of these five variables, years of RN experience made the largest unique contribution ( $\beta = .154$ ), followed by a personal history of SUD ( $\beta = .138$ ).

Therefore, for the study's third research question: "What personal or professional factors (highest educational degree, years of experience, clinical practice setting, and personal or professional experience with SUD) correlate to a more tolerant attitude toward SUD in anesthesia care providers?" the results failed to show statistically significant predictions of

personal or professional factors and tolerant attitudes toward impairment among nurse anesthesia providers.

### **Subscale Analysis**

The PNII was operationalized in this study to assess peer perceptions of NACP impairment. Hendrix et al. (1987) developed this instrument to determine attitudes toward impairment, specifically within the nursing field. While previous studies measured attitudes toward impairment, none were specific to the nursing profession. Hendrix et al. (1987) addressed this gap by creating four different versions of the instrument, each corresponding to a specific type of substance being abused. The instrument comprised nine subscales or factors that evaluated participants' perceptions of different areas of impairment. The questions contained in subscales were used to comprehensively assess various dimensions of peer perceptions of impairment within the nursing profession. As some subscales assessed participants' actions versus perceptions toward nurse impairment, the subscales were examined as a whole and not examined individually. Each subscale is listed, and their results are discussed below.

#### **Perception of Recognizability**

The subscale *Perception of Recognizability* focused on participants' abilities to identify impairment in their nursing colleagues from behavioral or physical indicators and whether the impairment is likely to be reported (see Table 14). Statements 23 and 24 on the survey assessed recognizability. One hundred forty-three participants (74.5%) answered they could recognize an impaired colleague by their behavior or physical signs. Forty-five percent of participants agreed or strongly agreed that impairment is more likely to be reported in anesthesia providers than in other healthcare-related professions.

## **Orientation to Impairment as an Illness**

Assessing participants' understanding of substance abuse as a medical illness was the basis for the *Orientation to Impairment as an Illness* subscale. Questions 25 and 26 on the survey aimed to determine if SUD should be treated as an illness or a moral or character flaw (see Table 15). Most participants (83.3%) either strongly agreed or agreed that impaired NACPs suffer from an illness. Conversely, only 14% indicated their belief that impairment results from personality weakness.

## **Perception of Prevalence**

The *Perception of Prevalence* subscale aimed to measure the perceived frequency of impairment among nursing professionals. The prevalence of how often participants believed that impairment occurred within the nursing profession was assessed using questions 27 and 28 on the survey (see Table 16). Over half of the participants (61.4%) indicated they did not believe that impairment is a widespread problem among NACPs. In comparison, only 14.1% participants either agreed or strongly agreed that impairment occurs less frequently in the nurse anesthesia profession than in other healthcare-related fields.

## **Distinctiveness to Nursing**

The *Distinctiveness to Nursing* subscale explored whether participants perceived impairment as unique to the nurse anesthesia profession. Distinctiveness refers to whether impairment is seen as a particular issue within nursing and was assessed by statements 29–32 on the survey (see Table 17). Most participants agreed that impaired NACPs problems occurred due to work-related stressors and that SUD among NACPs was likely caused by the same type of problems experienced by others with SUD or mental health challenges (79.2%).

## **Orientation to Helping Responsibility Within the Profession**

The *Orientation to Helping Responsibility Within the Profession* subscale focused on participants' perceptions of the role and capability of professional organizations in assisting impaired nurses. Participants' answers to questions 33–38 examined the responsibility of professional organizations to assist impaired nurses (see Table 18). All but one participant (0.5%) indicated they that believed professional organizations and regulatory bodies have a duty to provide impaired NACPs with information regarding legal and due process rights during disciplinary procedures. An overwhelming majority of participants agreed that the responsibilities of SBONs include offering impaired NACPs referrals to sources of assistance (99.5%), provides resources to support research on SUD prevention and treatment (97.9%), and providing impaired NACPs with specific information about the legal and due process rights (99.0%). Most participants also indicated the belief that major healthcare agencies should provide employee assistance programs to provide help to impaired NACPs (96.9%).

## **Treatability Orientation**

The *Treatability Orientation* subscale examined participants' belief in the potential for successful or effective substance abuse treatment with answers to questions 39, 40, and 41 (see Table 19). Six participants (3.1%) indicated the belief that little could be done to help impaired NACPs, and 27 participants (14.1%) agreed or strongly agreed that there was little chance for successful treatment and return to practice for impaired NACPs. One hundred and seventeen participants (60.9%) either agreed or strongly agreed that public safety could be assured by placing an impaired NACP's license on probation.



### **Orientation to the Nurse's Ability to Help**

The *Orientation to the Nurse's Ability to Help* subscale examined participants' perceptions of the role and ability of colleagues to assist impaired nurses. Responses to questions 42–45 aimed to elicit whether participants felt that colleagues had a responsibility to help and could do so (see Table 20). One hundred eleven participants (57.9%) strongly agreed or agreed that if made aware of a co-worker's impairment, nurse anesthesia peers could help. Perhaps by “help,” this meant offering sources of assistance. Although 172 participants (89.6%) agreed that impaired NACPs could be helped in a support group including other NACPs, 124 participants (64.6%) disagreed or strongly disagreed that the help an impaired provider required could only be provided by another nurse anesthesia provider.

### **Orientation to the Need to Know**

The *Orientation to the Need-to-Know* subscale included questions 46, 47, and 48, and explored how colleagues felt about disseminating a nurse's impairment to the public, supervisors, and co-workers (see Table 21). One hundred eighty-seven participants (97.4%) either agreed or strongly agreed that NACPs have a duty to report suspicions of impairment to a supervisor. However, only 31 participants believed supervisors had a right to know about an impaired NACP receiving SUD treatment. Only 49 participants (25.5%) indicated that they believed co-workers had a right to know if an NACP was receiving treatment for SUD.

### **Disciplinary Consequences**

The *Disciplinary Orientation* subscale investigated participants' attitudes toward punitive consequences resulting from nurse impairment. Questions 49–54 aimed to determine participants' opinions on the disciplinary actions that should be taken when impairment is identified (see Table 22). One hundred seventy participants (88.6%) either agreed or strongly

agreed that the supervising CRNA has a responsibility to suspend an NACP when there is concrete evidence of impairment. One hundred fifty participants (78.2%) responded that NACPs should not be allowed to work as registered nurses until after having successfully completed a treatment program. At the same time, 34 participants (17.7%) agreed or strongly agreed that impaired NACPs could continue to work as anesthesia providers while receiving treatment. Forty-three participants (22.4%) indicated that they believed an impaired CRNA license must be revoked or that the SBON should publish the names of impaired NACPs for the purposes of protecting the public. It is important to note that although Hendrix et al. (1987) included Question 54 as a disciplinary consequence, publishing the names of impaired providers may fit better with the construct of the *Orientation to the Need-to-Know* subscale discussed above.

### **Summary of the Findings**

A total of 193 NACPs participated in this cross-sectional, descriptive, correlational study to explore relationships between peer perceptions toward anesthesia care providers with SUD, demographic characteristics, education received during nurse anesthesia training, and various personal and professional characteristics. Perceptions of nurse impairment among NACPs were measured using the PNII (Hendrix et al., 1987). The analysis revealed there were strong perceptions toward impairment among NACPs. The study's results suggest there is support among this professional group toward SUD as a chronic, treatable illness. However, the belief that SUD results from a personality weakness, and NACPs with SUD can never fully recover or regain the trust of their peers remains as indicated by the findings of this survey. Chapter 5 summarizes the study and discusses conclusions and recommendations for future research.

## CHAPTER V

### SUMMARY OF THE STUDY

This research study examined the impact of SUD education on peer perceptions of nurse impairment among nurse anesthesia care providers. Among healthcare personnel, SUD is a prevalent issue and, if left untreated, can result in life-altering consequences such as loss of professional licensure, financial difficulties, and loss of family support. Additionally, errors related to anesthesia care are associated with significant morbidity and mortality. Therefore, the prevention and identification of and response to nurse anesthesia impairment is paramount to the provider and the patients under the nurse anesthetist's care.

The increased prevalence of SUD and lack of standardization among mandatory SUD educational content in NAEP curricula are significant concerns and formed the basis for this research study. The research question that guided this study was: How does mandatory SUD education in nurse anesthesia educational programs impact peer attitudes toward SUD among anesthesia care providers? This study provided insight regarding the presence of an impact and the directionality of the impact of SUD education received in an NAEP. Additionally, the study explored the relationships between attitudes toward peer impairment, demographic characteristics, and various personal and professional characteristics. The overall purpose of this study was to determine if SUD education during the NAEP curriculum led to a more favorable attitude or increased empathy toward impaired NACPs.

#### **Discussion of the Findings**

This chapter begins with a summary of the findings from this study, including a discussion of the guiding theoretical model, an overview of existing literature, and finally, the

conclusions drawn from the data collected in this study. Lastly, recommendations for future research and implications for educational programs are discussed.

### **Transformative Learning Theory**

Mezirow's (1997) transformative learning theory provided the theoretical framework for this study. The transformative learning theory suggests that negative biases learned from social contacts and childhood trauma can form the basis for discriminatory or judgmental behavior toward others. Conscious bias is an overt, outright negative feeling or behavior expressed intently through harassment or exclusion resulting from early learning or constant negative societal portrayals. Unconscious bias refers to attitudes, perceptions, or social stereotypes that influence the understanding of or actions toward those possessing a particular identity or characteristic apart from themselves (NCCC, n.d.). Mezirow (1997) believed that negative worldviews and perceptions could be changed through adult learning experiences— by reflecting on ideas and beliefs that conflict with assumptions brought forward through prior knowledge. Mezirow asserted that instrumental and communicative learning experiences could transform how adults communicate their feelings while becoming aware of conscious and unconscious biases.

A series of paradigm shifts formed by self-reflection become the framework for a more unbiased worldview. Instrumental learning influenced by disorienting dilemmas leads to reflection and critical assessment of one's assumptions (Mezirow, 1997). Instrumental learning through self-examination occurs when feelings of guilt or shame accompany past experiences. The literature reviewed discussed how clinical practicum experiences involving patients with SUD brought to light the unconscious biases of healthcare provider learners (Elliott et al., 2021; Geuijen et al., 2020; Schuler & Horowitz, 2020).

Like Knowles' model of andragogy (1980), the transformative learning theory explains that pre-existing perceptions or assumptions should be clearly presented to enable change through communicative learning. Communicative learning emphasizes open discussion of one's feelings. People who uncover hidden biases through communicating their feelings can begin changing their behaviors impacted by unconscious perceptions and biases (Mezirow, 1997; NCCC, n.d.).

### **Findings in Current Literature**

Comparing the existing literature and findings from this study yielded considerable similarities and differences. Healthcare providers exposed to SUD, whether by education or personal or professional experience, tended to look at SUD through the lens of a medical diagnosis rather than a personality defect, demonstrating more tolerant, empathetic attitudes toward people with SUD. Additionally, the majority of this study's participants were confident in their ability to recognize the signs and symptoms of impairment among colleagues, which differs from the findings in the existing literature. As this study's participants were all NACPs and the existing literature focused on non-anesthesia providers, this difference supports the need for more education in basic and advanced practice nursing curricula.

### **Connection to Theory**

Decreasing or abolishing stigmatizing attitudes and actions toward people with SUD is a necessary step in the ongoing process of SUD treatment and recovery. Reducing the stigma and shame of mental health-related medical conditions can be accomplished by changing perceptions of substance abuse from one of a moral character flaw to one of illness (APA, 2013; Bartlett et al., 2013; Knaak et al., 2020; Pavuluri et al., 2021). Beginning in the early 1900s, alcoholism and other drug dependencies were frequently viewed as illnesses. In 1956, the AMA declared

alcoholism an illness (Bettinardi-Angres & Angres, 2010). In 1987, almost three decades after the AMA defined alcoholism as an illness, addiction became an official disease diagnosis (APA, 2013). The literature supports SUD as a biological or psychosocial disorder linked to the neural reward pathways in the brain. SUD can be caused or contributed to by genetics, a predisposition caused by early life traumatic experiences, social factors, or a history of physical or sexual abuse (APA, 2013; Bettinardi-Angres & Angres, 2010). However, despite the AMA's declaration and the APA's disease diagnostic criteria, some people do not accept SUD as a disease or illness but rather see it as a character weakness or a moral flaw.

Beliefs guide actions. Therefore, negative perceptions of mental illness, including SUD, guide judgmental behaviors toward colleagues with SUD. Many reasons and scenarios exist that determine the basis of a person's belief system. A person who has never had exposure to someone with SUD may have more empathy and compassion for an impaired colleague; conversely that same inexperienced person may have deeply embedded negative perceptions of people with SUD. A provider who has gone through addiction and successfully entered recovery may judge their impaired peers much more harshly. Consequently, colleagues experiencing SUD are unwilling to seek assistance due to fear of judgment, ostracism, or disciplinary actions (Bartlett et al., 2013; Finnell et al., 2022). The literature emphasized that increasing targeted education is an avenue to change conscious and unconscious biases and, therefore, a way to change negative behaviors.

### **Perceptions of Nurse Impairment**

Perceptions of nurse impairment among NACPs were measured using the PNII (Hendrix et al., 1987). The analysis revealed varied perceptions toward impairment among NACPs. The results suggested that most participants in this specialized provider group view SUD as a

chronic, treatable illness. Most also believed in successful treatment and return to practice for impaired NACPs. Although most participants believed nurse anesthesia peers could help, most agreed that trained addiction specialists should guide successful treatment, whether those people were anesthetists in recovery or non-CRNAs. A small proportion of participants, however, indicated the belief that SUD results from a personality weakness and that those providers with SUD can never fully recover or regain the trust of their peers.

### **Recommendations for Further Study**

Recommendations for future studies include a longitudinal-designed study to correlate peer perceptions of anesthesia care provider impairment with specific educational content requirements and the incidence of SUD and perception among those providers. A longitudinal design may provide a more strenuous causal inference because of the additional variable of time (Polit & Beck, 2021).

Results from this study suggested a benefit to modifying the requirements for initial and continuing education related to SUD and the inclusion of SUD education in foundational nursing programs. The importance of early recognition and treatment extends into the undergraduate nursing curricula. Dittman (2012) noted that 100% of the RN participants in their study reported problematic substance use in nursing school.

Data collected from this study may lead to further studies exploring the directionality between a personal history of SUD, ongoing education, and pursuing a higher degree. Additionally, the choices for primary employment arrangement and primary clinical setting may be influenced by the personal history of SUD. NACPs in recovery from SUD may opt to specialize in addiction by educating and offering support to individuals in recovery or in need of

recovery in a non-clinical setting, thereby reducing accessibility and the potential for relapse (Carter et al., 2019; Valdes, 2014).

Lastly, a qualitative study examining the lived experiences of NACPs who suffer from SUD and sought treatment is recommended. This group of providers may lend a special insight into the barriers of seeking treatment and returning to clinical practice. Additionally, the experiences of NACPs who chose not to re-enter the clinical practice setting by either focusing on assisting others in recovery or leaving the nursing profession completely would be interesting. Furthermore, this study may offer the profession a unique perspective of the challenges impaired NACPs face and the obstacles they must overcome to get treatment for their illness.

### **Conclusions and Implications**

The results from this study contribute to the existing body of literature on impairment among healthcare professionals, focusing on NACPs. The population to which this study is generalizable are NACPs, including SRNAs and CRNAs. However, the results may have significance to other healthcare professionals, especially to other groups of anesthesia care providers, such as physician anesthesiologists, physician residents, and anesthesia assistants. Tragically, an anesthesia provider's first recognized occurrence of SUD may be an accidental or intentional overdose (Carter et al., 2019).

Although the AANA recommends early identification of SUD as part of an effective education plan, the determinates of effective SUD education remain unclear. As noted by Griffis et al. (in press), the content and consistency of SUD education among NAEPs varies greatly and may be a contributing factor in the lack of a statistically significant relationship between peer perceptions impairment and receiving SUD education in NAEP curriculum. Strategies to educate members of this anesthesia provider group on the risk factors of SUD should be instituted and



reinforced throughout the educational curriculum. Recommendations to the AANA, COA, and NBCRNA regarding the adoption of consistent, clear content covering topics such as prevention, identification, treatment, and return to practice in NAEPs and requirements for certification and continued certification should be considered if the nurse anesthesia profession wants a fighting chance to decrease the incidence of the “greatest occupational hazard facing this specialized care provider group” (Quinlan, 2003, p.16).

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**Table 1***Sample Demographic Characteristics*

Characteristics	<i>n</i>	%
Gender		
Female	112	58.3
Male	77	40.1
Prefer not to answer	3	1.6
Race/ethnicity		
African American	8	4.2
American Indian/Alaskan Native	1	0.5
Asian/Pacific Islander	7	3.6
Caucasian	168	87.5
Hispanic/Latino	7	3.6
Marital Status		
Single	29	15.1
Married	144	75.0
Divorced	19	9.9

*Note.* *N* = 192.

**Table 2***Sample Professional Characteristics*

Characteristic	<i>n</i>	%
Clinical status		
CRNA	169	88.0
SRNA	23	12.0
Highest educational degree		
Diploma or certificate	1	.5
Associate's degree	1	.5
BSN	21	10.9
BS, not nursing	5	2.6
MSN	73	38.0
Master's degree, not nursing	27	14.1
Doctoral degree, nursing	57	29.7
Doctoral degree, not nursing	7	3.6
Primary employment arrangement		
Solo anesthesia provider	18	9.4
CRNA-only practice	17	8.9
ACT	104	54.2
FT educator, PT clinician	20	10.4
PT educator, PT clinician	7	3.6
Adjunct faculty member, FT clinician	3	1.6
Primary practice setting		
Acute care hospital	128	66.7
ASC	30	15.6
Office-based setting	9	4.7

*Note.* *N* = 192. ACT = anesthesia care team; ASC = ambulatory surgical center; BS = Bachelor of Science; BSN = Bachelor of Science in Nursing; CRNA = certified registered nurse anesthetist; FT = Full-time; MSN = Master of Science in Nursing; PT = Part-time; SRNA = student registered nurse anesthetist.

**Table 3***Reliability Statistics Overall Scale and Subscales*

Measure	No. items	Cronbach's $\alpha$	<i>M</i>	<i>SD</i>
Total PNII scale	32	.710	62.91	7.039
Subscale				
Perception of recognizability	2	.228	4.72	.956
Orientation to impairment as an illness	2	.568	3.64	1.186
Perception of prevalence	2	.552	4.49	1.167
Distinctiveness to nursing	4	.410	8.19	1.675
Orientation to helping responsibility within the profession	6	.814	8.61	2.458
Treatability orientation	3	.236	5.70	1.295
Orientation to the nurse's ability to help	4	.141	9.11	1.406
Orientation to the need to know	3	-.449	5.30	1.141
Disciplinary orientation	6	.199	13.15	2.229

*Note.* PNII = Perceptions of Nurse Impairment Inventory; SUD = substance use disorder.

**Table 4***PNII Scale Descriptive Statistics*

	Min	Max	<i>M</i>	<i>SD</i>	<i>Md</i>	Skewness	Kurtosis
Total PNII score	46	82	62.91	7.093	62.00	.085	-.501

*Note.* *N* = 192. PNII = Perceptions of Nurse Impairment Inventory.

**Table 5***Test for Normality, Shapiro-Wilk Test, per IV*

	Received SUD education in NAEP	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Total PNII score	Yes	0.84	140	.017	.989	140	.354
	No	0.84	52	.200	.979	52	.488

*Note.* NAEP = nurse anesthesia educational program; PNII = Perceptions of Nurse Impairment Inventory; SUD = substance use disorder.

**Table 6***Demographic Variables Model Summary*

Model <sup>a</sup>	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	SE of the estimate	Durbin-Watson
1	.255 <sup>b</sup>	.065	.045	6.9	1.865

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory score.

<sup>b</sup>Predictors: (constant), age, gender, ethnicity/race, marital status.

**Table 7***Demographic Variables Collinearity Statistics*

Variable	Collinearity statistics <sup>a</sup>	
	Tolerance	VIF
Gender	.987	1.013
Ethnicity/race	.958	1.043
Marital status	.879	1.137
Age	.882	1.134

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory score

**Table 8***Demographic Variables Regression ANOVA*

	Model <sup>a</sup>	Sum of squares	df	Mean square	F	Sig. <sup>b</sup>
1	Regression	625.401	4	156.350	3.220	0.14
	Residual	8982.415	185	48.554		
	Total	9607.816	189			

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory score.

<sup>b</sup>Predictors: (constant), age, gender, ethnicity/race, marital status.

**Table 9***Demographic Variables Regression Coefficients*

Variable <sup>a</sup>	B	SE	$\beta$	t	Sig.	95.0% CI	
						LL	UL
Gender	-.764	.889	-.061	-.859	.391	-2.518	.990
Ethnicity/race	1.231	.766	.117	1.609	.109	-.279	2.742
Marital status	-1.687	1.078	-.119	-1.564	.119	-3.815	.441
Age	.133	.046	.218	2.874	.005	.042	.225

*Note.* CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

<sup>a</sup>Dependent Variable: total Perception of Nurse Impairment Inventory score.

**Table 10***Personal and Professional Variables Model Summary*

Model <sup>a</sup>	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	SE of the estimate	Durbin-Watson
1	.232 <sup>b</sup>	.054	0.28	6.992	1.952

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory score.

<sup>b</sup>Predictors: (constant), highest education degree; years registered nursing experience; clinical practice setting; personal history of substance use disorder; experience with a colleague with substance use disorder; friend or relative with substance use disorder.



**Table 11***Personal and Professional Variables Collinearity Statistics*

Variable	Collinearity statistics <sup>a</sup>	
	Tolerance	VIF
Highest educational degree	.909	1.100
Years experience as RN	.926	1.080
Primary practice setting	.974	1.027
Personal history of SUD	.994	1.006
Experience with a colleague with SUD	.826	1.211
Experience with a friend/relative with SUD	.935	1.070

*Note.* RN = registered nurse; SUD = substance use disorder

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory Score.

**Table 12***Personal and Professional Variables Regression ANOVA*

	Model <sup>a</sup>	Sum of squares	df	Mean square	F	Sig. <sup>b</sup>
1	Regression	447.783	6	74.630	1.511	.178
	Residual	7853.613	159	49.394		
	Total	8301.396	165			

<sup>a</sup>Dependent Variable: total Perception of Nurse Impairment Inventory score.

<sup>b</sup>Predictors: (constant), highest education degree, years registered nursing experience; clinical practice setting; personal history of substance use disorder; experience with a colleague with substance use disorder; friend or relative with substance use disorder.

**Table 13***Personal and Professional Variables Regression Coefficients*

Variable <sup>a</sup>	B	SE	$\beta$	t	Sig.*	95.0% CI	
						LL	UL
Highest educational degree	-.093	.412	-.018	-.225	.822	-.906	.720
Years RN experience	0.95	.050	.154	1.923	.056	-.003	.193
Primary practice setting	-.007	.989	-.001	-.007	.994	-1.960	1.945
History of SUD	4.026	2.262	.138	1.780	.077	-.440	8.493
Colleague with SUD	1.967	1.418	.118	1.388	.167	-.832	4.767
Friend/relative with SUD	.739	1.242	.047	.595	.553	-1.714	3.192

*Note.* CI = confidence interval; LL = lower limit; RN = registered nurse; SUD = substance use disorder; UL = upper limit.

<sup>a</sup>Dependent variable: total Perception of Nurse Impairment Inventory score.

\* $p < .05$

**Table 14***Perception of Recognizability*

Perception of recognizability	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
I could probably recognize an impaired NAP in the work setting by their behavior.	143	74.5	49	25.5
Impairment, when it occurs, is more likely to be reported in a NAP than in other health-related fields.	87	45.3	105	54.7

*Note.* NAP = nurse anesthesia provider.

**Table 15***Orientation to Impairment as an Illness*

Orientation to impairment as an illness	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
Impaired NAPs can best be understood as people who suffer from an illness.	160	83.3	33	16.7
Impairment is generally the result of a weakness in the NAP's personality.	166	86.5	26 <sup>a</sup>	13.5

*Note.* NAP = nurse anesthesia provider.

<sup>a</sup> No strongly disagree answers.

**Table 16***Perception of Prevalence*

Perception of prevalence	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
Impairment is a widespread problem among NAPs.	74	38.5	118	61.5
Impairment occurs less frequently in NAPs than in other health-related fields.	168	87.5	24	12.5

*Note.* NAP = nurse anesthesia provider.

**Table 17***Distinctiveness to Nursing*

Distinctiveness to nursing	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
In most cases, the problems of impaired NAPs stem from difficulties that those individuals have already encountered.	135	70.3	57	29.7
The problems of impaired NAPs often reflect stressful situations on the job.	144	75.0	48	25.0
Becoming impaired is something that could happen to any NAP.	165	85.9	27	14.1
The problems of impaired NAPs are not very different than those of other individuals with substance abuse/misuse or emotional problems.	152	79.2	40	20.8

*Note.* NAP = nurse anesthesia provider.

**Table 18***Orientation to Helping Responsibility Within the Profession*

Orientation to helping responsibility within the profession	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
The SBON's responsibility should include offering the impaired NAP a referral to sources of assistance.	191	99.5	1	0.5
The SBON should provide resources to support research on preventing and treating impairment.	188	97.9	4 <sup>a</sup>	2.1
Major healthcare agencies should be required to provide employee assistance programs that could serve the impaired NAP.	186	96.9	6 <sup>a</sup>	3.1
When a NAP has a reason to believe that a co-worker is impaired, they have a responsibility to help that person receive assistance.	172	89.6	20	10.4
The SBON is responsible for providing NAPs suspected of impairment with specific information about their legal and due process rights in all disciplinary procedures.	190	99.0	2 <sup>a</sup>	1
When a supervisor suspects that a NAP is impaired, they have a responsibility to help that person receive assistance.	185	96.4	7 <sup>a</sup>	3.6

*Note.* NAP = nurse anesthesia provider; SBON = state board of nursing.

<sup>a</sup>No strongly disagree answers.

**Table 19***Treatability Orientation*

Treatability orientation	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
Even after treatment, it is unusual for an impaired NAPs to be productive and trustworthy.	27	14.1	165	85.9
Little can be done to help NAPs who are impaired.	6	3.1	186	96.9
In most cases, public safety can be assured by placing the impaired NAP's license on probation.	117	60.9	75	39.1

*Note.* NAP = nurse anesthesia provider.

**Table 20***Orientation to the Nurse's Ability to Help*

Orientation to the nurse's ability to help	Strongly agree		Strongly disagree	
	or agree		or disagree	
	<i>n</i>	%	<i>n</i>	%
The help needed by an impaired NAP usually requires the type of insight that only another NAP is likely to provide.	68	35.4	124	64.6
When aware of a co-worker's impairment, fellow NAPs can usually offer assistance.	111	57.8	81	42.2
Most impaired NAPs could be helped in a support group with other NAPs.	172	89.6	20	10.4
When suspecting impairment in a coworker, the NAP's first response should be to confront that individual.	142	74.0	51	26.0

*Note.* NAP = nurse anesthesia provider.

**Table 21***Orientation to the Need to Know*

Orientation to the need to know	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
NAPs have an obligation to notify their supervisor when they suspect impairment in a coworker.	187	97.4	5 <sup>a</sup>	2.6
If an impaired NAP is receiving treatment, their supervisor needs to know.	161	83.9	31	16.1
If an impaired NAP is receiving treatment, their coworkers need to know.	143	74.5	49	25.5

*Note.* NAP = nurse anesthesia provider.

<sup>a</sup>No strongly disagree answers.



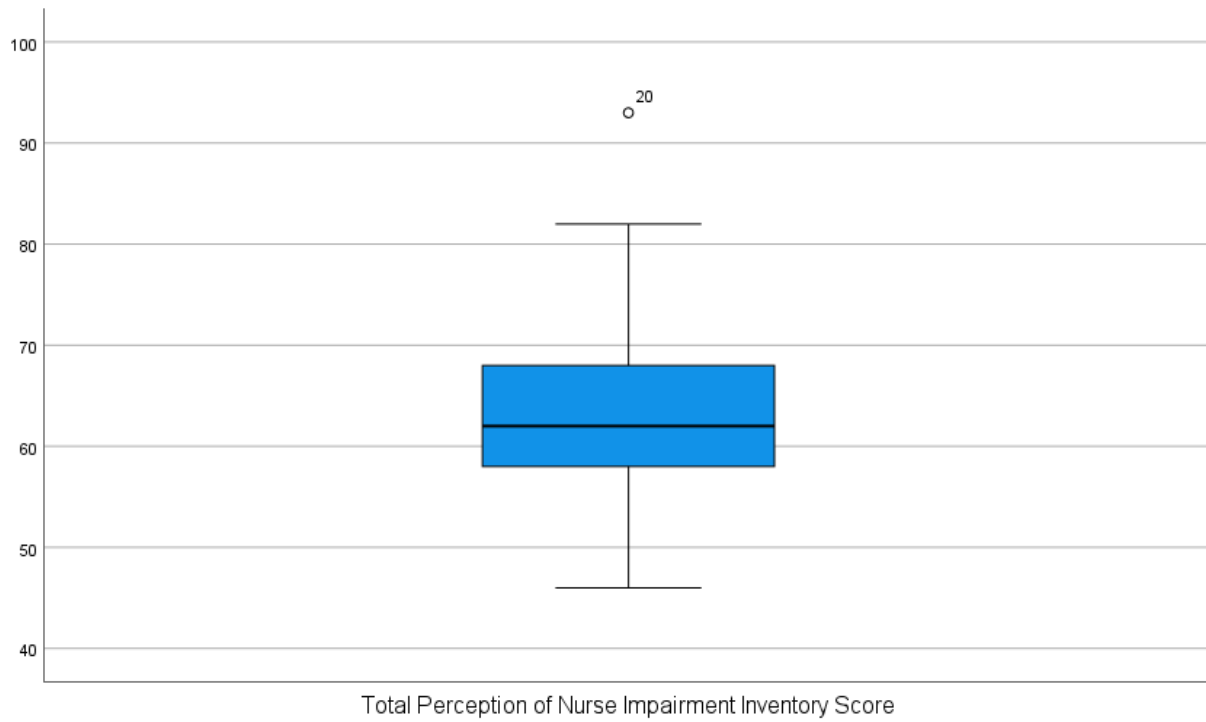
**Table 22***Disciplinary Orientation*

Disciplinary orientation	Strongly agree or agree		Strongly disagree or disagree	
	<i>n</i>	%	<i>n</i>	%
As a rule, impaired NAPs should not be allowed to work as RNs until they have successfully completed a treatment program.	150	78.2	42	21.9
When a nursing supervisor has concrete evidence that a NAP is impaired, the supervisor has a responsibility to suspend that individual pending investigation of the charges.	170	88.5	22	11.5
While receiving treatment, most impaired NAPs are capable of continuing to work as anesthesia providers.	158	82.3	34	17.7
When a nursing supervisor has concrete evidence that a NAP is impaired, the supervisor has a responsibility to dismiss that individual immediately and report the case to the SBON.	100	52.1	92	47.9
In most cases, public safety should require that impaired NAP's licenses be revoked.	149	77.6	43	22.4
For purposes of public protection, the SBON should continue to publish the names of all NAPs found to be impaired.	149	77.6	43	22.4

*Note.* RN = registered nurse; NAP = nurse anesthesia provider; SBON = state board of nursing.

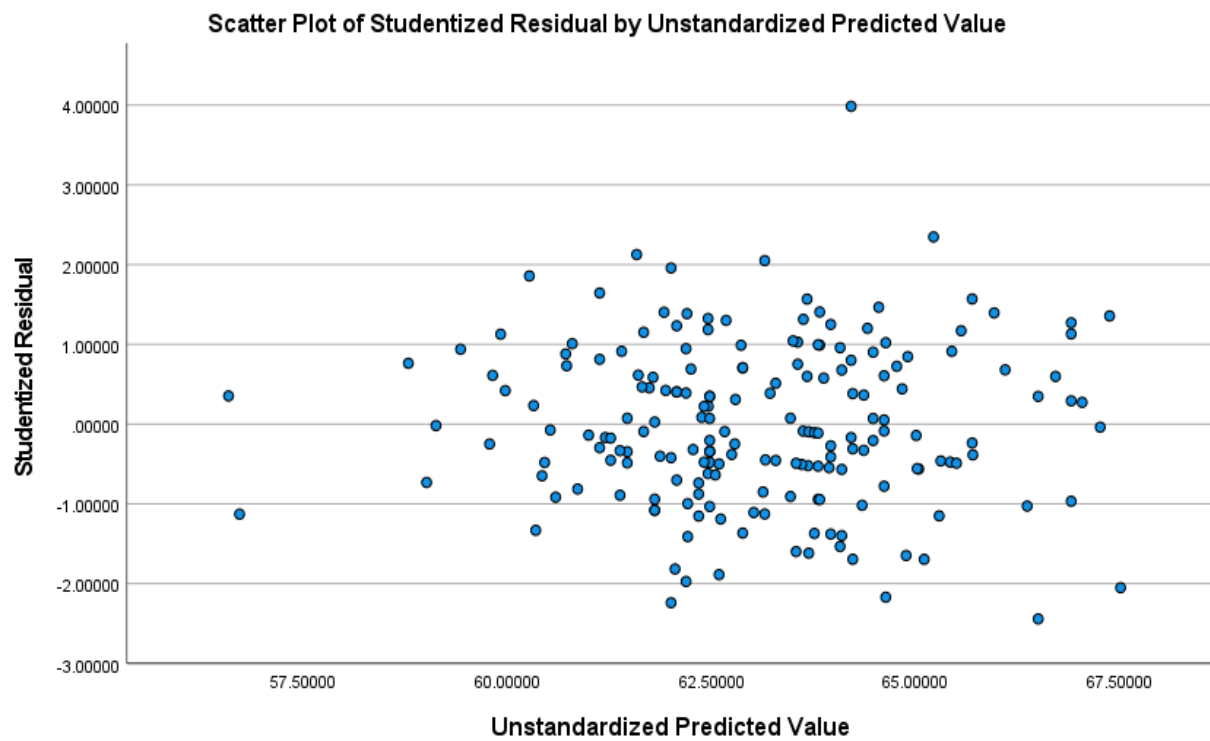
**Figure 1**

*Total PNII Boxplot*



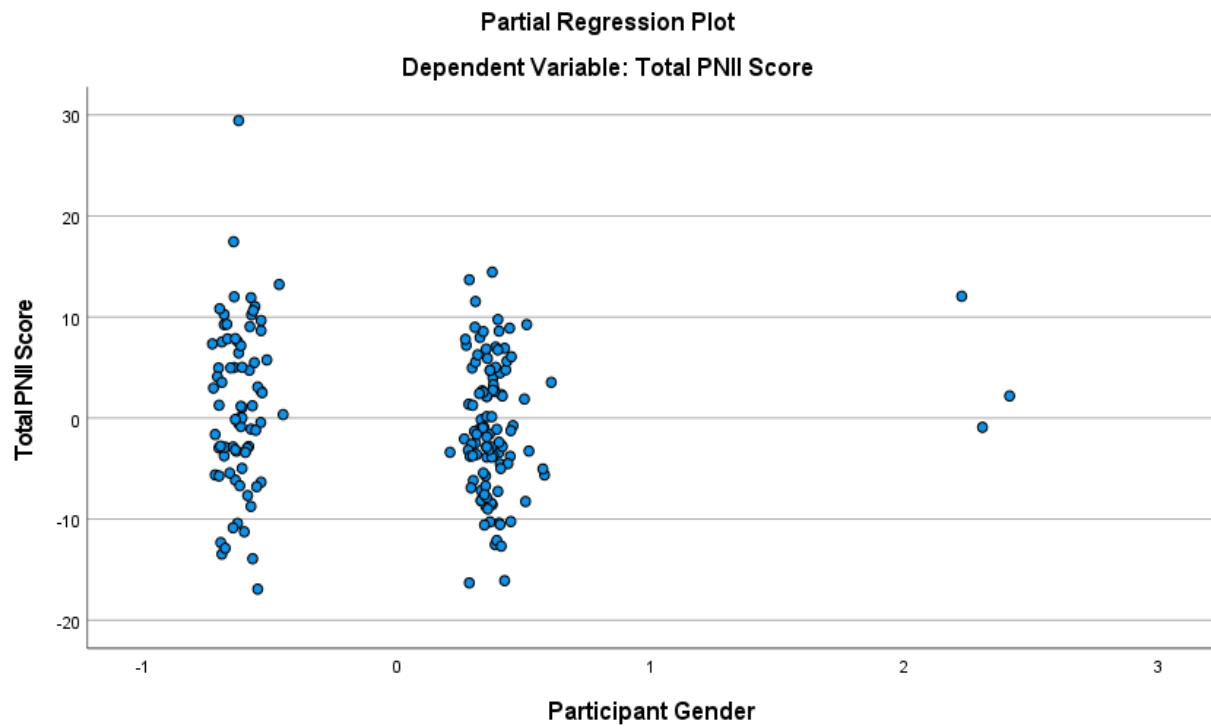
**Figure 2**

*Scatter Plot of Studentized Residuals for Demographic Characteristics*



**Figure 3**

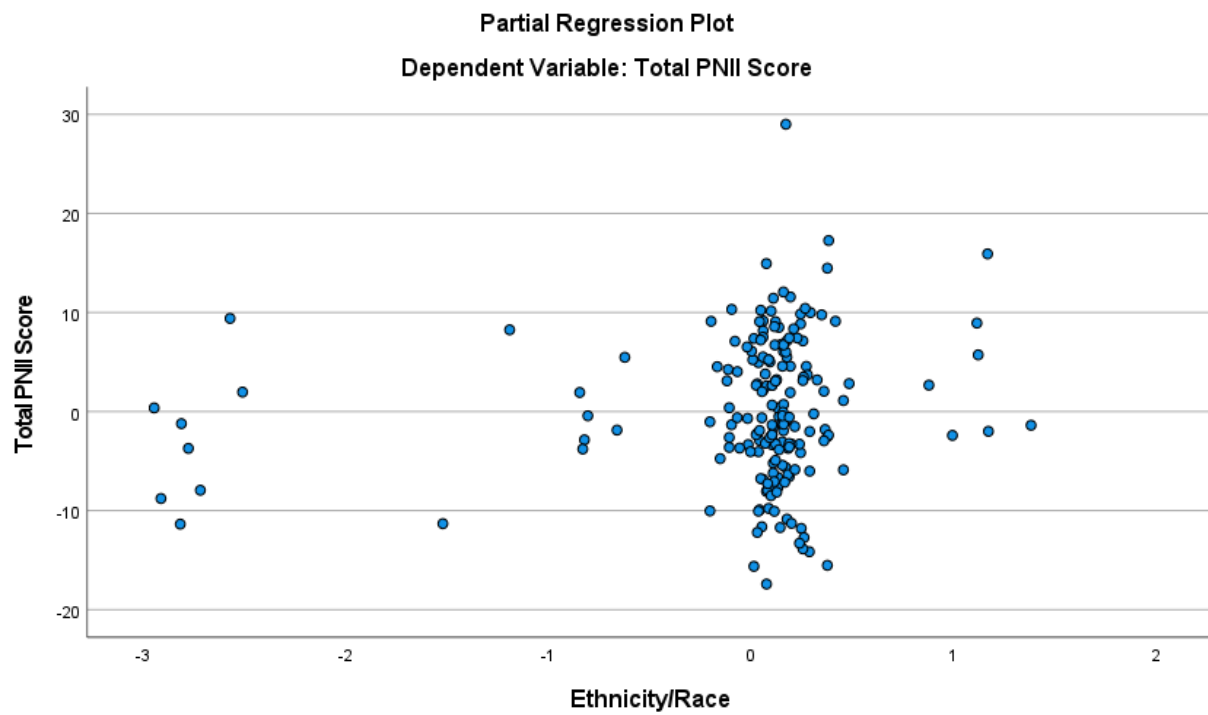
*Partial Regression Plot: Total PNII Score and Gender*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 4**

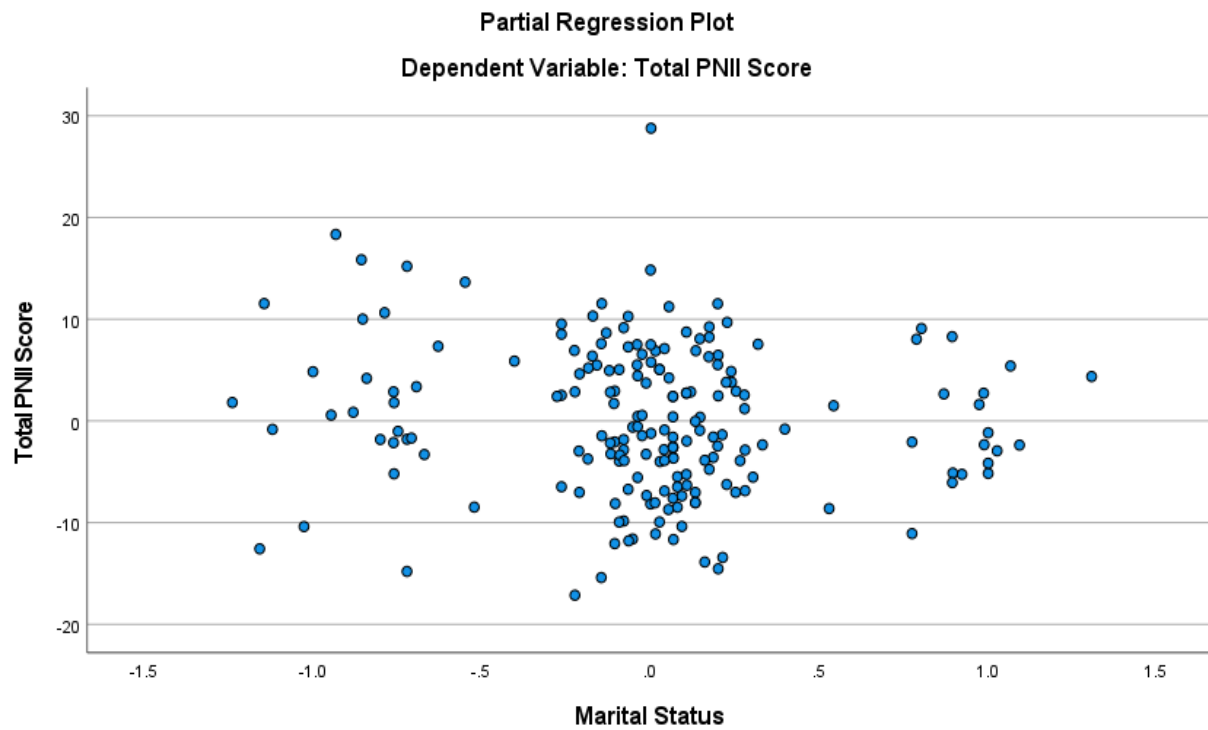
*Partial Regression Plot: Total PNII Score and Ethnicity/Race*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 5**

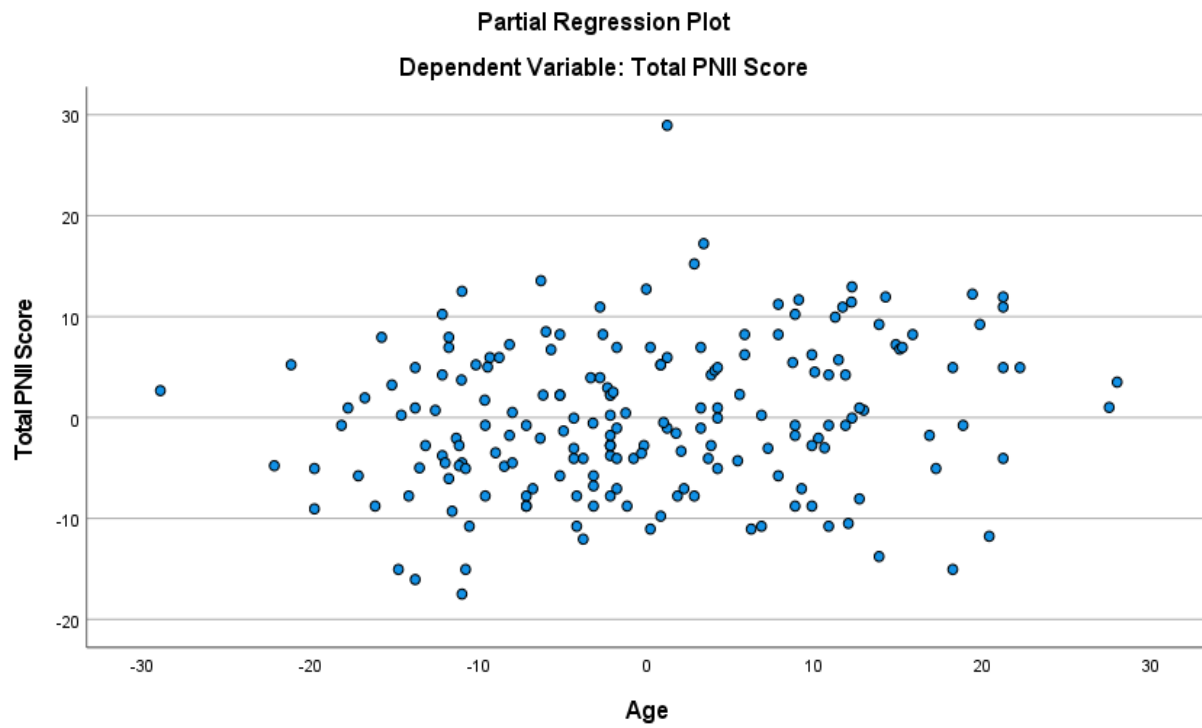
*Partial Regression Plot: Total PNII Score and Marital Status*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 6**

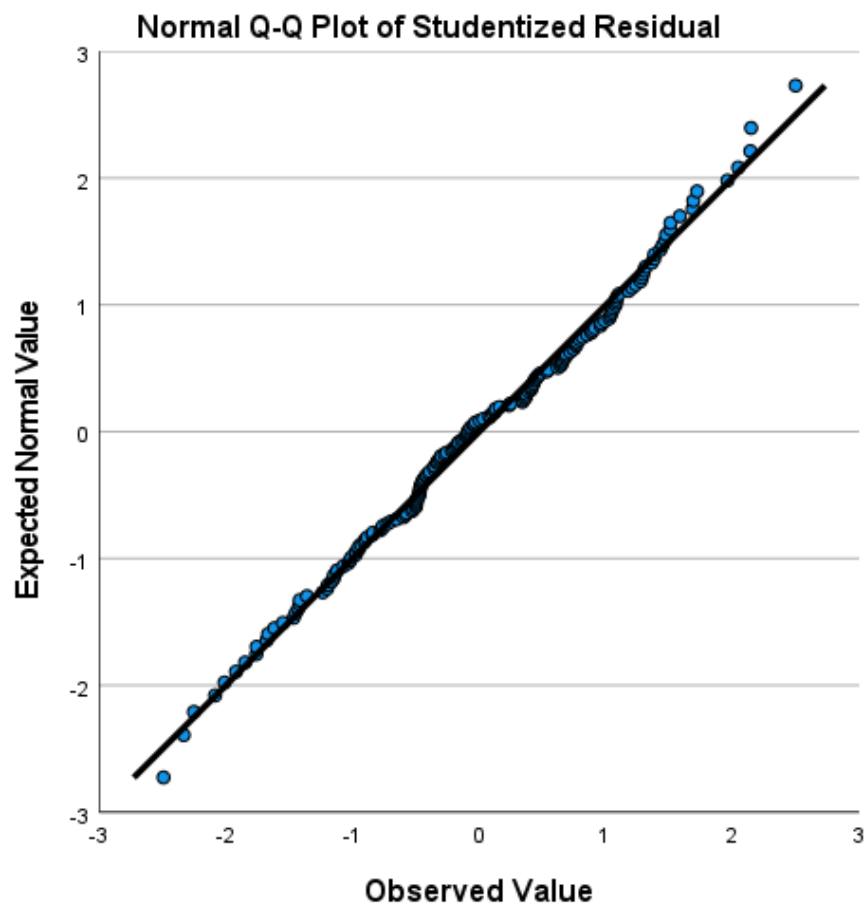
*Partial Regression Plot: Total PNII Score and Age*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 7**

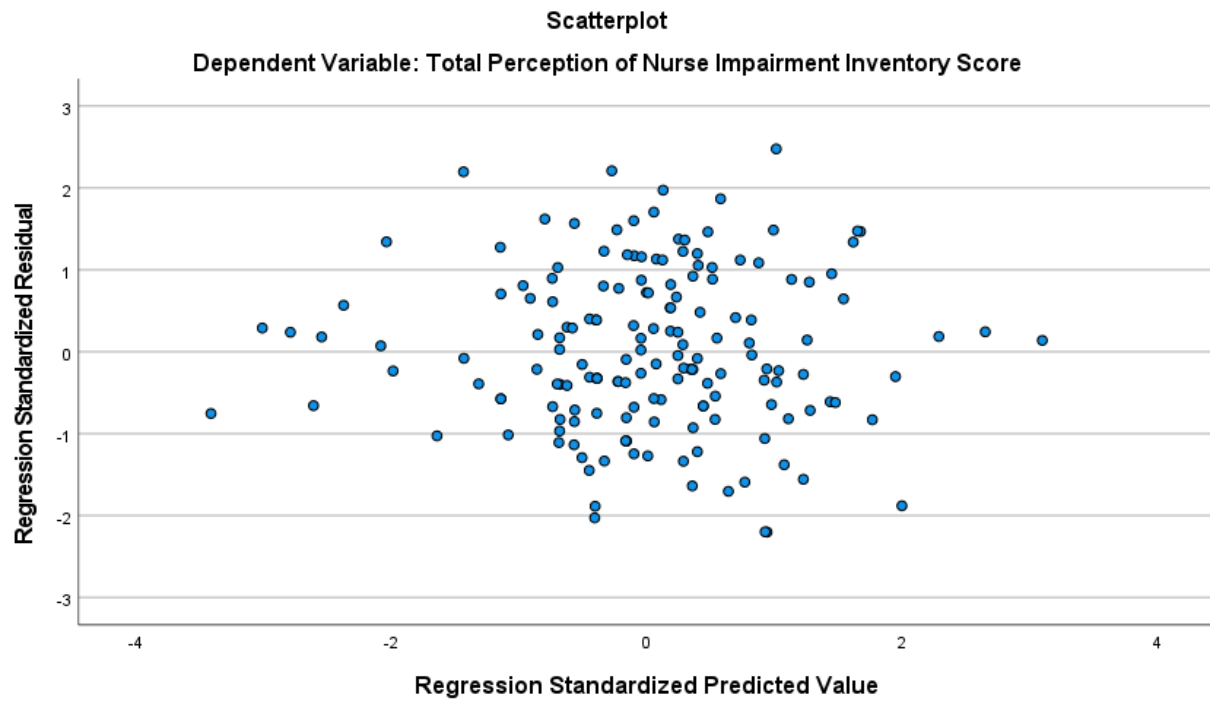
*Demographic Characteristics Test for Normality, Q-Q Plot*





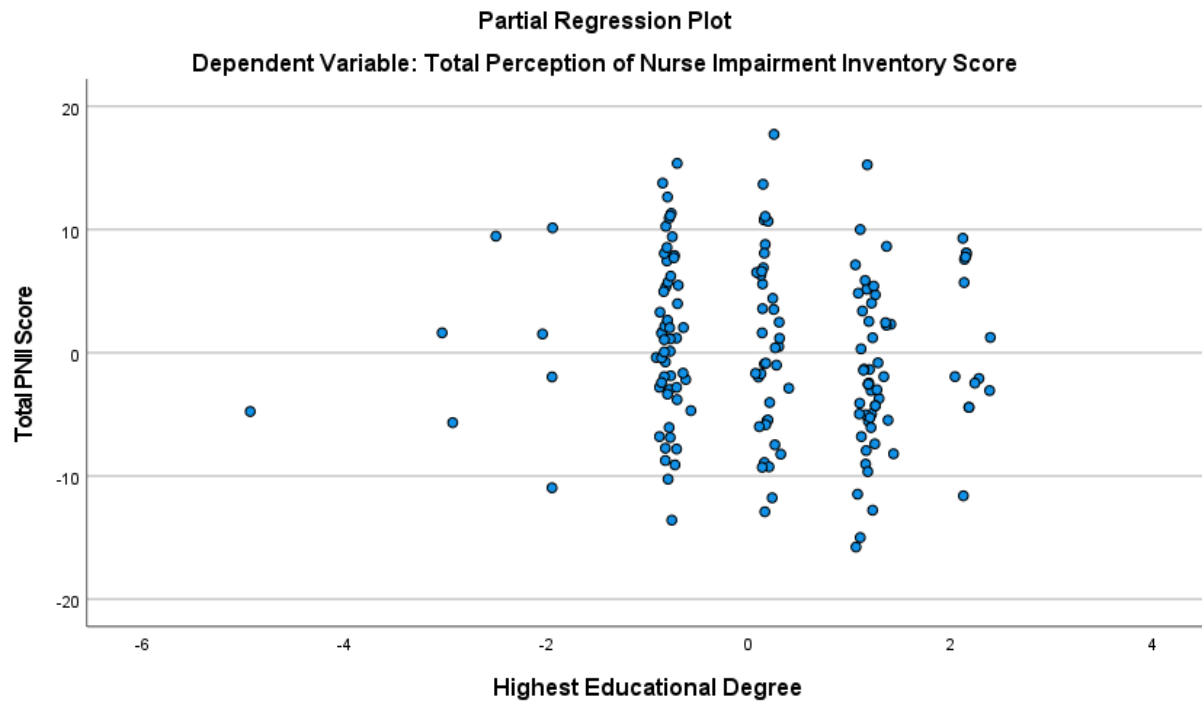
**Figure 8**

*Scatter Plot of Studentized Residuals for Personal and Professional Factors*



**Figure 9**

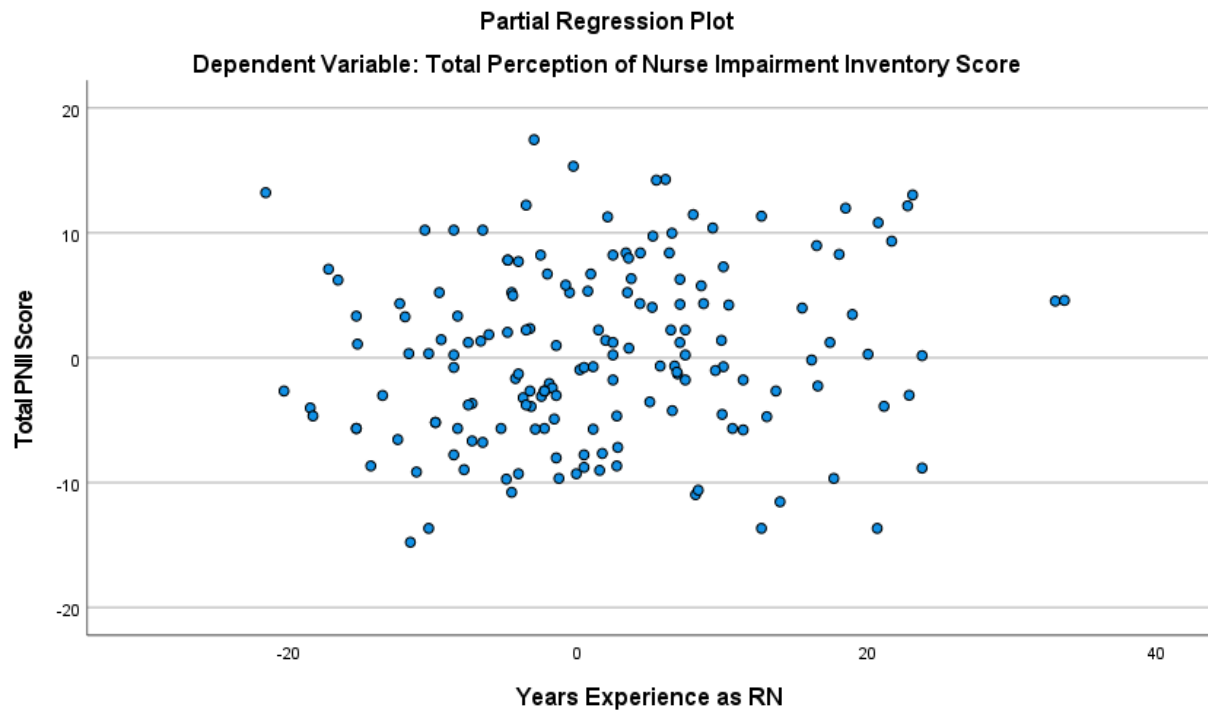
*Partial Regression Plot: Total PNII Score and Highest Educational Degree*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 10**

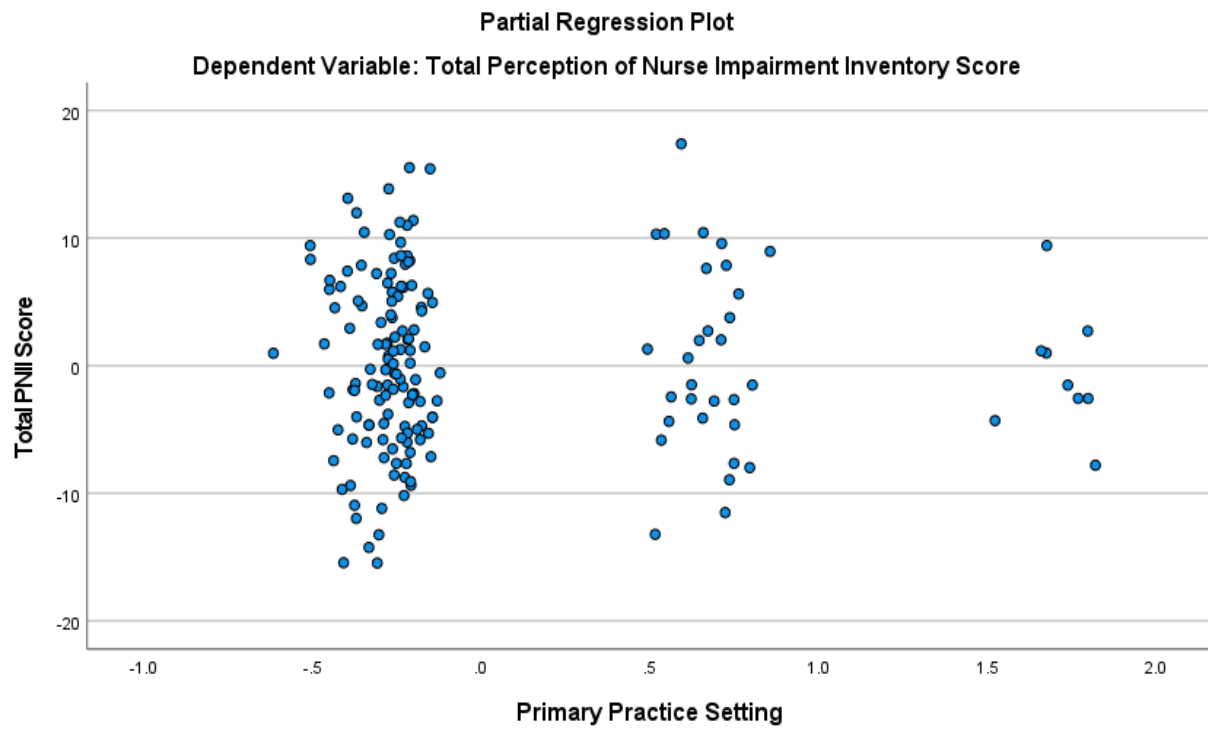
*Partial Regression Plot: Total PNII Score and Years of RN Experience*



*Note.* PNII = Perception of Nurse Impairment Inventory; RN = registered nurse.

**Figure 11**

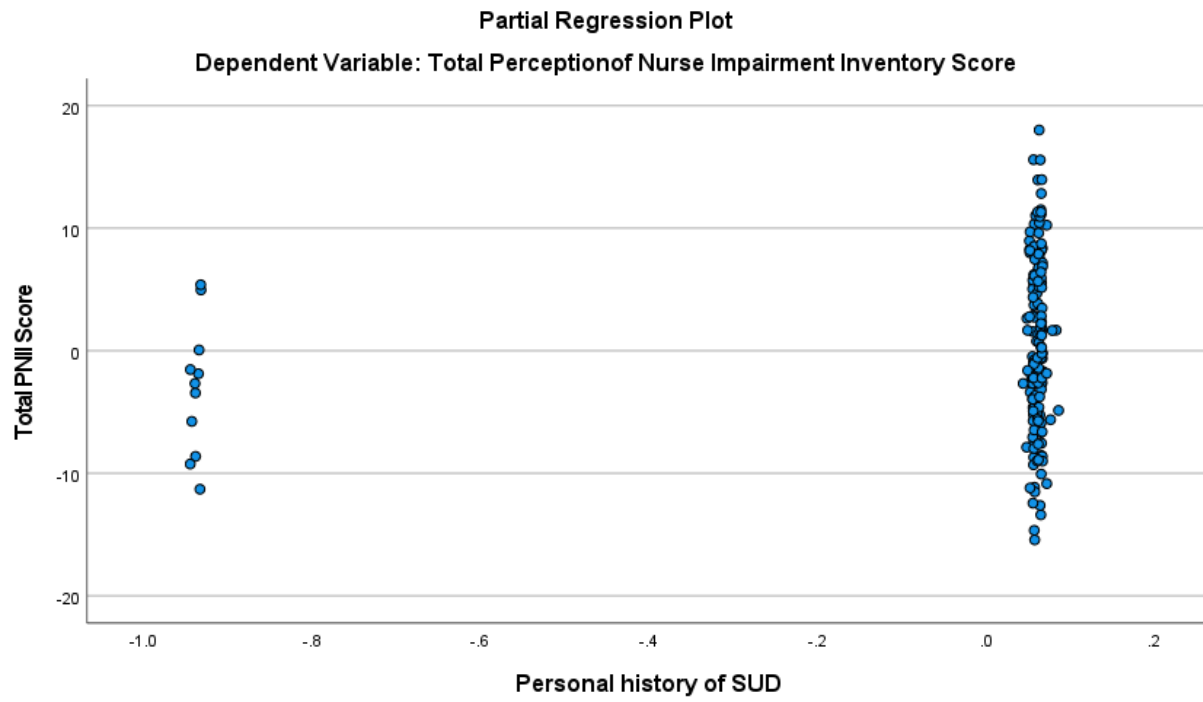
*Partial Regression Plot: Total PNII Score and Primary Practice Setting*



*Note.* PNII = Perception of Nurse Impairment Inventory.

**Figure 12**

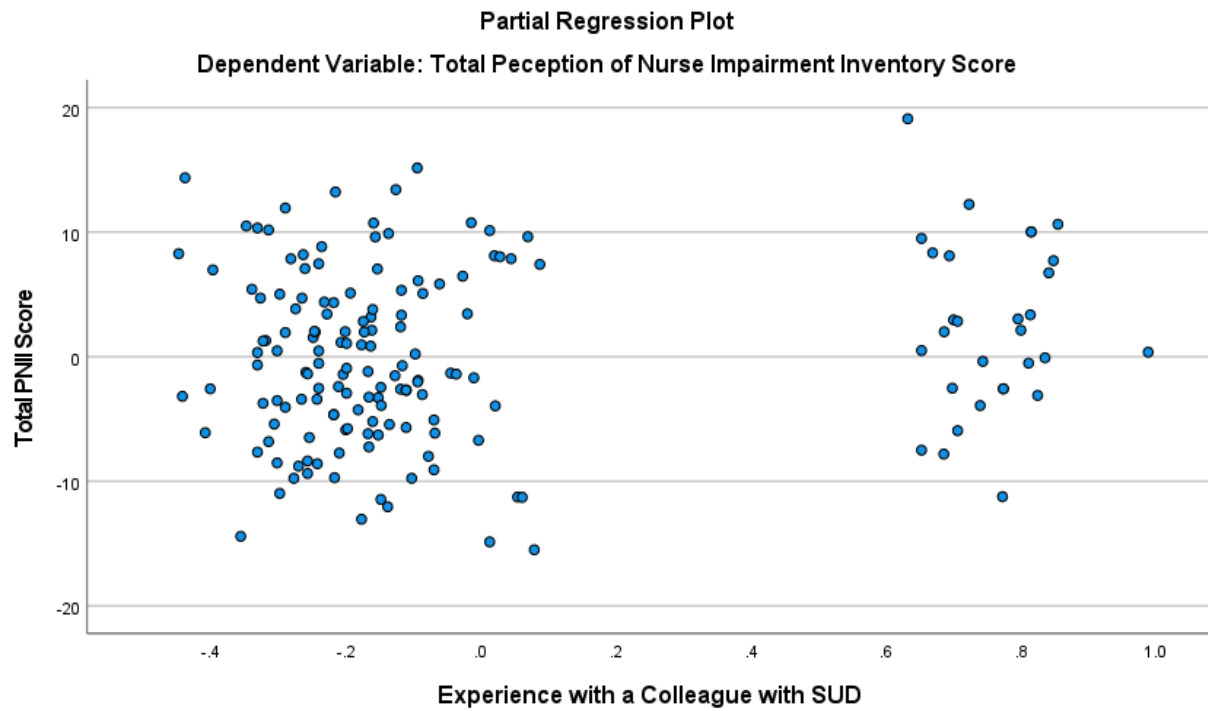
*Partial Regression Plot: Total PNII Score and Personal History of SUD*



*Note.* PNII = Perception of Nurse Impairment Inventory; SUD = substance use disorder.

**Figure 13**

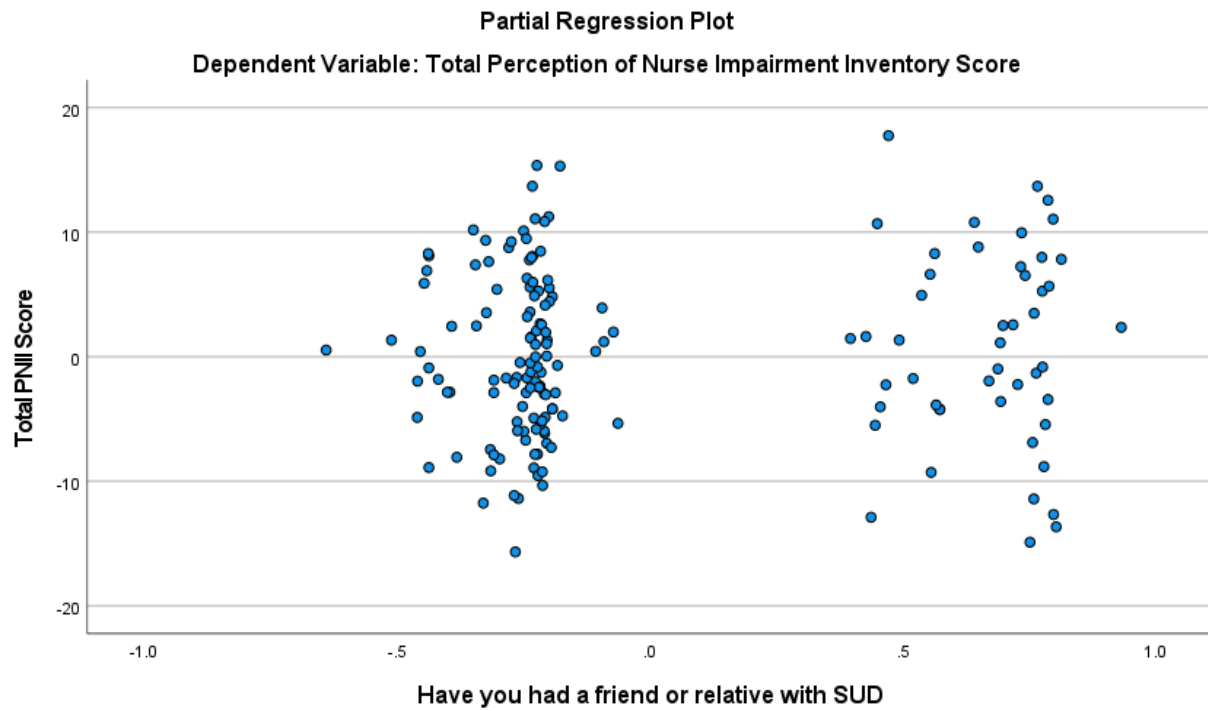
*Partial Regression Plot: Total PNII Score and Experience With Colleagues' SUD*



*Note.* PNII = Perception of Nurse Impairment Inventory; SUD = substance use disorder.

**Figure 14**

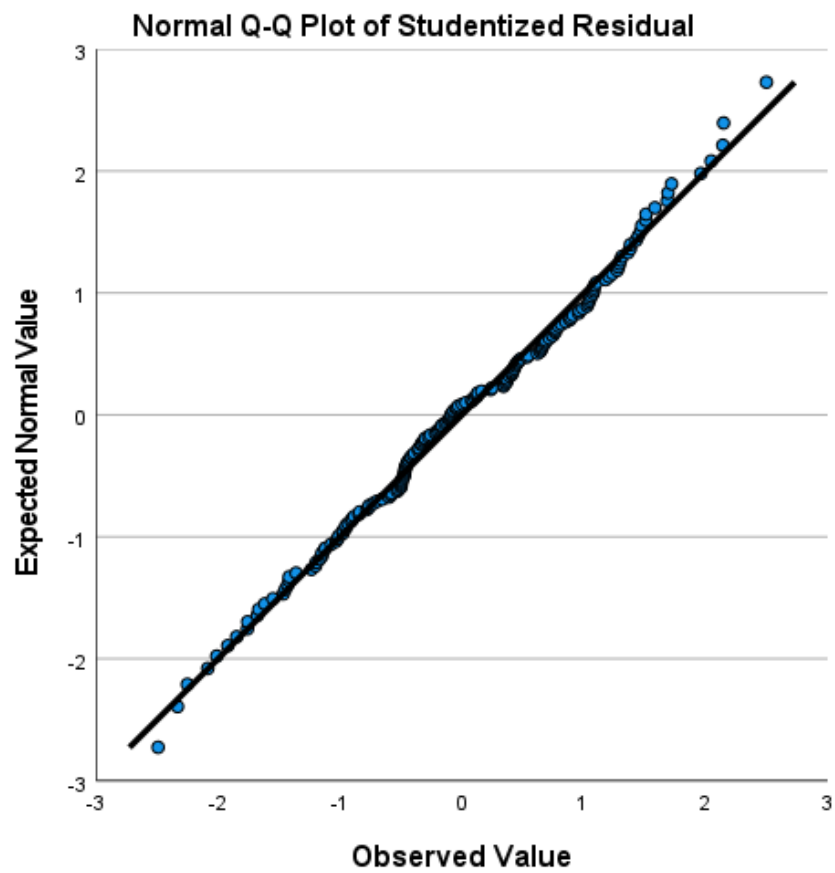
*Partial Regression Plot: Total PNII Score and Friend or Relative With SUD*



*Note.* PNII = Perception of Nurse Impairment Inventory; SUD = substance use disorder.

**Figure 15**

*Personal and Professional Factors Test for Normality, Q-Q Plot*





# APPENDIX A

## SURVEY INSTRUMENT

### **The Impact of Mandatory Substance Use Disorder Education on Peer Perception of Impairment in Nurse Anesthesia Care Providers**

This research project aims to determine the attitudes toward substance use disorder among anesthesia care providers.

This research project is being conducted by Katrina Vice O'Con, CRNA, a Ph.D. student at Texas Woman's University. You have been invited to participate in this research because you are an anesthesia care provider.

Your participation in this research study is completely voluntary. You can withdraw from participating in the study at any time.

This study involves completing a series of questions that should take approximately 25 minutes. You are not required to answer every question. However, some questions do require an answer to move to the next question. Your responses will be confidential, and we will not collect identifying information such as your name, email, or IP address. Total privacy cannot be guaranteed as there is a potential risk of loss of confidentiality in all email, downloading, and internet transactions. We will protect your confidentiality to the extent that is permitted by law.

The survey questions will be about your knowledge of and attitude toward substance use disorder among anesthesia care providers.

We will do our best to keep your information confidential. All data is stored in a password-protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Texas Woman's University representatives.

A separate link will be provided to participants who complete all portions of the study to be entered into a drawing to win one of five \$100 Amazon gift cards. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

If you have any questions about the research study, please contact:

Principal Investigator Katrina Vice O'Con at [kocon@twu.edu](mailto:kocon@twu.edu) or (318) 560-9761  
or  
Faculty Advisor Dr. Misty Richmond at [MRichmond4@twu.edu](mailto:MRichmond4@twu.edu) or (940) 898-2430

This research has been reviewed according to Texas Woman's University IRB procedures for research involving human subjects.

If you have any questions about your rights as a participant in this research or concerns regarding how this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at (940) 898-3378 or via email at [IRB@twu.edu](mailto:IRB@twu.edu).

ELECTRONIC CONSENT: Please select your choice below.

Selecting the "agree" button below indicates that:

you have read the above information  
you voluntarily agree to participate  
you are at least 18 years of age

If you do not wish to participate in the research study, please decline by selecting the "disagree" button.

- ☐ Agree  
☐ Disagree

2. Please select the answer choice identifying your gender.

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer not to say

3. Please select the ethnicity with which you most identify.

- ☐ African American
- ☐ American Indian / Alaskan Native
- ☐ Asian / Pacific Islander
- ☐ Caucasian
- ☐ Hispanic/Latino

4. Please select current marital status.

- ☐ Single
- ☐ Married
- ☐ Divorced
- ☐ Separated
- ☐ Widowed

5. Please enter your age, in years.

---

6. Please enter the number of years you have been licensed as a Registered Nurse.

---

7. Please select the highest educational degree earned.

- ☐ Diploma or certificate
- ☐ Associate degree
- ☐ Bachelor's degree in nursing
- ☐ Bachelor's degree, not nursing
- ☐ Master's degree in nursing
- ☐ Master's degree, not nursing
- ☐ Doctoral degree in nursing
- ☐ Doctoral degree, not nursing

8. Please select your current clinical status.

- ☐ Certified Registered Nurse Anesthetist
- ☐ Student/Resident Registered Nurse Anesthetist

9. What year in your nurse anesthesia curriculum are you in currently?

- ☐ First
- ☐ Second
- ☐ Third

10. What year did you graduate from your nurse anesthesia program? (Please enter as a 4-digit year)

---

11. Please select the option that best describes your primary employment arrangement.

- ☐ Solo anesthesia provider
- ☐ CRNA-only practice
- ☐ Anesthesia Care Team model
- ☐ Full-time educator, part-time clinical provider
- ☐ Part-time educator, part-time clinical provider
- ☐ Adjunct faculty member, full-time clinical provider

12. Please select the option that best describes your primary clinical practice setting.

- ☐ Acute care hospital
- ☐ Ambulatory Surgery Center
- ☐ Office-based setting

13. As part of your nurse anesthesia program, did you receive education in substance use disorder?

- ☐ Yes
- ☐ No

14. Approximately how many clock hours of education in substance use disorder did you receive in your nurse anesthesia program?

- ☐ < 1 hour
- ☐ 1 - 4 hours
- ☐ > 4 hours

15. In what format did you receive substance use disorder education? Select all that apply.

- ☐ Live faculty or guest lecture
- ☐ Recorded audio
- ☐ Video content
- ☐ Written material

16. As part of the substance use disorder content, were you required to complete an assessment to prove competency in substance use disorder concepts?

- ☐ Yes
- ☐ No

17. Do you currently or have you previously experienced a substance use disorder?

- ☐ Yes
- ☐ No

18. Regarding your current or previous personal substance use disorder, do you (or did you) experience problems with:

- ☐ Alcohol
- ☐ Drugs
- ☐ Both alcohol and drugs
- ☐ Other \_\_\_\_\_

19. Please select the substance(s) you currently or previously used/abused/misused. Select all that apply.

- ☐ Alcohol
- ☐ Anesthesia Inhalation Agents
- ☐ Benzodiazepines
- ☐ Opioids
- ☐ Prescription medications (prescribed to you)
- ☐ Prescription medications (not prescribed to you)
- ☐ Propofol, Ketamine, or other sedative/induction medication
- ☐ Illicit drugs (cocaine, hallucinogens, methamphetamines, heroin, etc.)
- ☐ Marijuana (legal status in your state)
- ☐ Marijuana (not legal status in your state)
- ☐ Other \_\_\_\_\_

20. Do you engage in continuing education related to substance use disorder?

☐ Yes

☐ No

21. Do you have personal experience with a work colleague who has/had a substance use disorder?

☐ Yes

☐ No

22. Do you have personal experience with a friend or relative who has/had a substance use disorder?

☐ Yes

☐ No

For the following questions, please indicate your perception of the **Recognizability** of Nurse Anesthesia providers with Impairment.

	Strongly agree	Agree	Disagree	Strongly disagree
23. I could probably recognize an impaired Nurse Anesthesia provider in the work setting by their behavior.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Impairment, when it occurs, is more likely to be reported in a Nurse Anesthesia provider than in other health-related fields.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of impairment in Nurse Anesthesia providers as an **Illness**.

	Strongly agree	Agree	Disagree	Strongly disagree
25. Impaired Nurse Anesthesia providers can best be understood as people who suffer from an illness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Impairment is generally the result of a weakness in the Nurse Anesthesia provider's personality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of the **Prevalence** of Nurse Anesthesia providers with impairment.

	Strongly agree	Agree	Disagree	Strongly disagree
27. Impairment is a widespread problem among Nurse Anesthesia providers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Impairment occurs less frequently in Nurse Anesthesia providers than in other health-related fields.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of the **Distinctiveness** of Nurse Anesthesia provider impairment.

	Strongly agree	Agree	Disagree	Strongly disagree
29. In most cases, the problems of impaired Nurse Anesthesia providers stem from difficulties that those individuals have already encountered.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. The problems of impaired Nurse Anesthesia providers often reflect stressful situations on the job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Becoming impaired is something that could happen to any Nurse Anesthesia provider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. The problems of impaired Nurse Anesthesia providers are not very different than those of other individuals with substance abuse/misuse or emotional problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception regarding the orientation to the **Helping Responsibility** within the profession of Nurse Anesthesia for those with substance use disorder.

	Strongly agree	Agree	Disagree	Strongly disagree
33. The State Board of Nursing's responsibility should include offering the impaired Nurse Anesthesia provider a referral to sources of assistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. The State Board of Nursing should provide resources to support research on preventing and treating impairment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Major healthcare agencies should be required to provide employee assistance programs that could serve the impaired Nurse Anesthesia provider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. When a Nurse Anesthesia provider has a reason to believe that a co-worker is impaired, they have a responsibility to help that person receive assistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. The State Board of Nursing is responsible for providing Nurse Anesthesia providers suspected of impairment with specific information about their legal and due process rights in all disciplinary procedures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. When a supervisor suspects that a Nurse Anesthesia provider is impaired, they have a responsibility to help that person receive assistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of the **Treatability** of Nurse Anesthesia providers with impairment.

	Strongly Agree	Agree	Disagree	Strongly disagree
39. Even after treatment, it is unusual for an impaired Nurse Anesthesia provider to be productive and trustworthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Little can be done to help Nurse Anesthesia providers who are impaired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. In most cases, public safety can be assured by placing the impaired Nurse Anesthesia provider's license on probation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of fellow **Nurse Anesthesia Provider's Ability** to Help Impaired Nurse Anesthesia providers.

	Strongly agree	Agree	Disagree	Strongly disagree
42. The help needed by an impaired Nurse Anesthesia provider usually requires the type of insight that only another Nurse Anesthesia provider is likely to provide.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. When aware of a co-worker's impairment, fellow Nurse Anesthesia providers can usually offer assistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Most impaired Nurse Anesthesia providers could be helped in a support group with other Nurse Anesthesia providers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. When suspecting impairment in a coworker, the Nurse Anesthesia provider's first response should be to confront that individual.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of the **Need to Know** related to impaired Nurse Anesthesia providers.

	Strongly agree	Agree	Disagree	Strongly disagree
46. Nurse Anesthesia providers have an obligation to notify their supervisor when they suspect impairment in a coworker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. If an impaired Nurse Anesthesia provider is receiving treatment, their supervisor needs to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. If an impaired Nurse Anesthesia provider is receiving treatment, their coworkers need to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, please indicate your perception of the **Disciplinary Actions** of Nurse Anesthesia providers with impairment.

	Strongly agree	Agree	Disagree	Strongly disagree
49. As a rule, impaired Nurse Anesthesia providers should not be allowed to work as registered nurses until they have successfully completed a treatment program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. When a nursing supervisor has concrete evidence that a Nurse Anesthesia provider is impaired, the supervisor has a responsibility to suspend that individual pending investigation of the charges.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. While receiving treatment, most impaired Nurse Anesthesia providers are capable of continuing to work as anesthesia providers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. When a nursing supervisor has concrete evidence that a Nurse Anesthesia provider is impaired, the supervisor has a responsibility to dismiss that individual immediately and report the case to the State Board of Nursing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. In most cases, public safety should require that impaired Nurse Anesthesia providers' licenses be revoked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. For purposes of public protection, the State Board of Nursing should continue to publish the names of all Nurse Anesthesia providers found to be impaired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

55. As a reminder, the information entered into this survey is confidential, and neither email nor IP addresses are collected. Please add any additional comments related to substance or alcohol use that you have experienced or witnessed in registered nurses, physicians, certified registered nurse anesthetists, or other healthcare personnel.

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56. Your participation is appreciated. Would you like to be entered into a drawing for a chance to win a \$100 Amazon Gift Card?

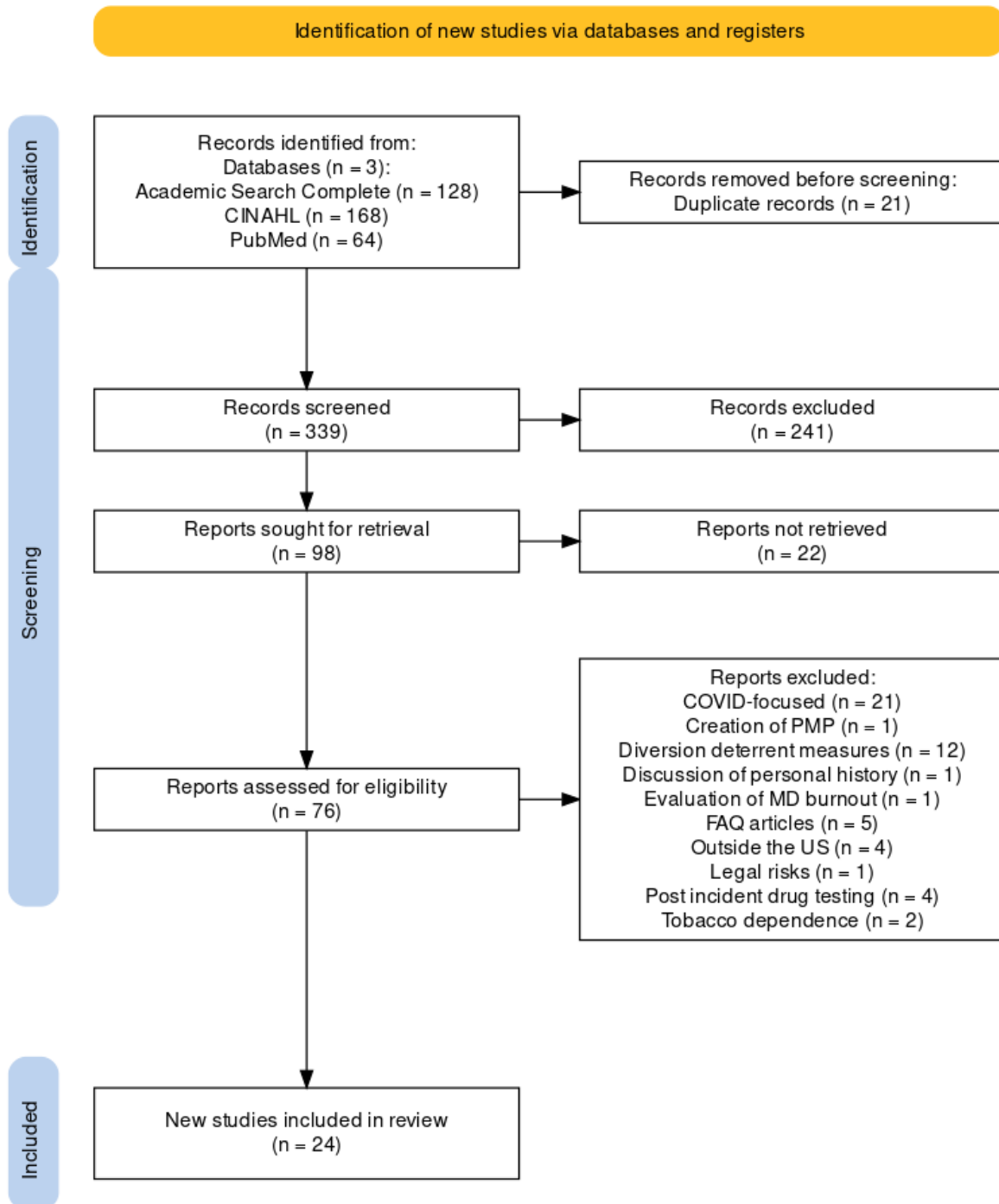
☐ Yes

☐ No



## APPENDIX B

### PRISMA DIAGRAM



(Haddaway et al., 2022; Page et al., 2021)

## APPENDIX C

### RECRUITMENT EMAIL

The Impact of Mandatory Substance Use Disorder Education on Peer Perception of Impairment  
in Nurse Anesthesia Care Providers

**Subject Line: CRNA-led Research Study. Enter a drawing for a \$100 Amazon Gift Card**

Dear Nurse Anesthesia Care Provider,

This research project aims to determine attitudes toward substance use disorder among anesthesia care providers.

This research project is being conducted by Katrina Vice O'Con, DNAP, CRNA, a Ph.D. student at Texas Woman's University. You have been invited to participate in this research because you are a nurse anesthesia care provider.

Your participation in the study is completely voluntary. You can withdraw from participating in the study at any time.

This study involves completing a series of questions that should take no more than 25 minutes. You are not required to answer every question. However, some questions do require an answer to move to the next question. Your responses will be confidential, and we will not collect identifying information such as your name, email address, or IP address. Total privacy cannot be guaranteed as there is the potential risk of loss of confidentiality in all email, downloading, electronic meetings, and internet transactions. We will protect your confidentiality to the extent that is permitted by law.

The survey questions will be about your attitude toward substance use disorder among anesthesia care providers.

We will do our best to keep your information confidential. All data is stored in a password-protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Texas Woman's University representatives.

A separate survey link will be available to participants who complete all portions of the study to be entered into a drawing to win one of five \$100 Amazon gift cards.

If you have any questions about the research study, please contact:

Principal Investigator Katrina Vice O'Con at [kocon@twu.edu](mailto:kocon@twu.edu) or (318) 560-9761  
or

Faculty Advisor Dr. Misty Richmond at [MRichmond4@twu.edu](mailto:MRichmond4@twu.edu) or (940) 898-2430

Thank you in advance for your participation and helping to increase the body of research conducted by CRNAs,

Katrina Vice O'Con

[https://twu.qualtrics.com/jfe/form/SV\\_3pZ9qd0Uefgkt4W](https://twu.qualtrics.com/jfe/form/SV_3pZ9qd0Uefgkt4W)

## APPENDIX D

### AANA ELECTRONIC SURVEY POLICY AND ORDER FORM

**American Association of Nurse Anesthesiology**  
**AANA Electronic Survey Policy and Order Form**

Version 6-1-22

#### **Sample Selection Criteria:**

The sample will be randomly selected from the pool of your **specified** selection criteria at the application form. **Please do not leave this section blank.** You may choose your survey sample based on AANA members' geographical locations or/and their member types.

For example, members of the AANA are automatically members in their state of residence or the state they work, if different. Your selection request may be based on a state of membership (where they work) or the state of residence (where they live). We cannot guarantee a sufficient quantity of work addresses/email addresses and will complete the order with home contact information, if necessary. The following are the AANA member types that can be selected:

<b>AANA Member Types</b>	<b>Information</b>
<b>Certified:</b>	Passed exam within 2 years – practicing – voting member
<b>Recertified:</b>	Passed exam over 2 years ago – practicing – voting member
<b>Student:</b>	Currently enrolled in a Nurse Anesthesia Program

#### **Sample Selection Method:**

A **random selection** of members will be generated. Random selection is based on computer generated numbers with a uniform distribution -- there is an equal probability of getting any one random number as another. Members that have opted out of mass email communication from the AANA are not included.

#### **Response Rate:**

The **email survey response rate** is approximately 5-7% for typical research. The researcher should estimate their effective sample size based on 5-7%, although the AANA **cannot guarantee** that your response rate will reach that percentage. Recently the survey response rate has dramatically declined to as low as 3%.

**American Association of Nurse Anesthesiology**  
**AANA Electronic Survey Policy and Order Form**

Version 6-1-22

## **Security and Privacy of the Survey**

- **Security and Privacy of Data:**  
The survey site is periodically reviewed and updated with security measures to ensure the best possible protection for your data. The survey site stores personal information of members and panelists in secure databases protected by passwords as well as database and network firewalls to prevent the loss, misuse or alteration of personal or survey information. The network operations staff performs regular security audits on the servers. In addition, the hosting facility conducts regular and ongoing independent audits and supplies with data for optimization. Data from surveys is stored at a secure hosting facility with both physical and software-based security systems. The survey site provides SSL encryption for survey participants.
  
- **At no time** will the researcher have access to AANA member email addresses or any members' identified information.
  
- **Who has access to the files?**  
Only authorized personnel from AANA in charge of the survey can access the files.
  
- **What happens to the data at the AANA after it is given to the researchers?**  
The responses and surveys are destroyed 12 months after launching the survey.
  
- **Does the AANA keep any hard copies of the electronic surveys?**  
The AANA does not keep any hard copies of the electronic surveys.

**American Association of Nurse Anesthesiology  
AANA Electronic Survey Policy and Order Form**

**AANA Electronic Survey**

**Frequent Questions and Answers:**

**1) Will I see a preview of the survey before it is deployed?**

Yes, AANA will send a survey preview for the researcher to check his/her survey and correct any errors before the formal survey launch. It is preferred that the instrument is field tested prior to final submission for data collection and the survey is launched. Once the survey is deployed, there is **no way to make any changes** for the launched instrument.

**2) How often are reminders sent to participants who may not have responded to the initial invitation?**

One reminder is sent seven days before the survey is closed to all non-respondents and respondents who did not finish the survey.

**3) What is the targeted period of time for the survey?**

The survey typically remains open up to 4 weeks.

**4) What can I anticipate as the cost for this email survey?**

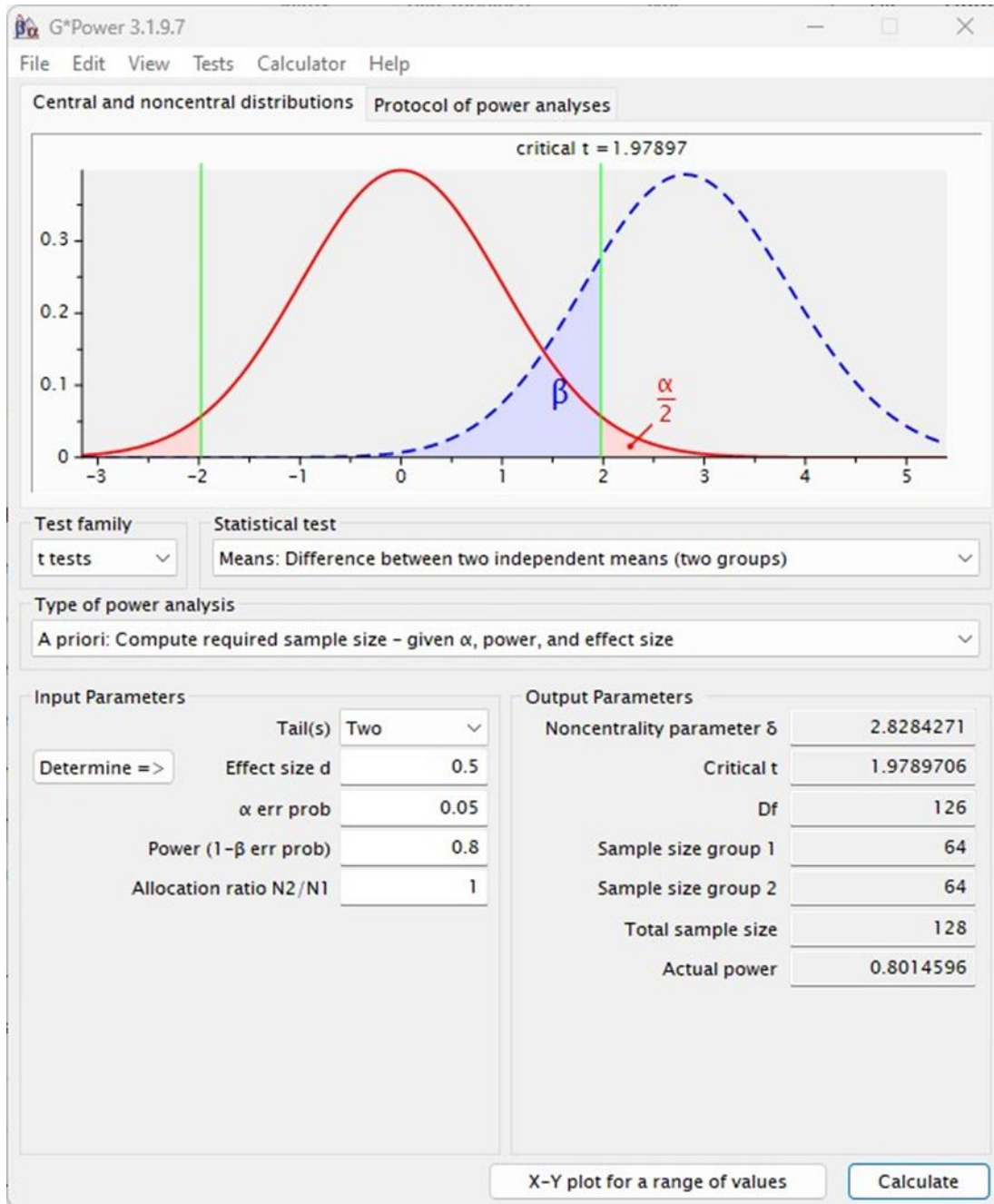
For example, a survey sent to **two thousand** recipients having an instrument of **twenty-four** questions and **three** skip logics (branching questions), the fee will be \$2,350. The \$2,350 is summed by the following items: \$600 (a set up fee) + \$250 (for *twenty-four* questions in the instrument) + \$1,000 (for reaching *two thousand* members) + \$500 (*more than two* branching (skip logic) questions). Please refer to the fee schedule section to estimate your fee for more details.

**5) How does opt-out work during the survey process, and what is the opt-out rate?**

The AANA will send the survey invitations to the number of recipients you request. The recipients can choose to opt-out or take the survey after they receive the invitation. The opt-out option is listed **at the end** of *each* invitation message. When a recipient chooses the opt-out option, the system places the email address in the opt-out pool, and future surveys from this researcher will not be sent. Approximately **1% to 3 %** of all recipients choose to opt-out of the survey. Those recipients who opt-out will not be directed to the survey site; they will be directed to a webpage that indicates that they have been placed on the opt-out list.

# APPENDIX E

## POWER ANALYSIS



## APPENDIX F

### APPROVAL FROM INSTITUTIONAL REVIEW BOARD



**Texas Woman's University**  
**Institutional Review Board (IRB)**

[irb@twu.edu](mailto:irb@twu.edu)

<https://www.twu.edu/institutional-review-board-irb/>

December 9, 2022

Katrina Ocon  
Nursing - Dallas, Nursing - Denton

Re: Exempt - IRB-FY2023-96 The Impact of Mandatory Substance Use Disorder Education on the Perception of Impairment in Nurse Anesthesia Care Providers: Are We Making a Difference?

Dear Katrina Ocon,

The above referenced study has been reviewed by the TWU IRB - Dallas operating under FWA00000178 and was determined to be exempt on December 8, 2022.

Note that any modifications to this study must be submitted for IRB review prior to their implementation, including the submission of any agency approval letters, changes in research personnel, and any changes in study procedures or instruments. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All modification requests, incident reports, and requests to close the file must be submitted through Cayuse.

On December 31, 2023, this approval will expire and the study must be renewed or closed. A reminder will be sent 45 days prior to this date.

If you have any questions or need additional information, please email your IRB analyst at [irb@twu.edu](mailto:irb@twu.edu) or refer to the [IRB website](#).

Sincerely,

TWU IRB - Dallas

## APPENDIX G

### INFORMED CONSENT FORM

#### **The Impact of Mandatory Substance Use Disorder Education on Peer Perception of Impairment in Nurse Anesthesia Care Providers**

This research project aims to determine the attitudes toward substance use disorder among anesthesia care providers.

This research project is being conducted by Katrina Vice O'Con, CRNA, a Ph.D. student at Texas Woman's University. You have been invited to participate in this research because you are an anesthesia care provider.

Your participation in this research study is completely voluntary. You can withdraw from participating in the study at any time.

This study involves completing a series of questions that should take approximately 25 minutes. You are not required to answer every question. However, some questions do require an answer to move to the next question. Your responses will be confidential, and we will not collect identifying information such as your name, email, or IP address. Total privacy cannot be guaranteed as there is a potential risk of loss of confidentiality in all email, downloading, and internet transactions. We will protect your confidentiality to the extent that is permitted by law.

The survey questions will be about your knowledge of and attitude toward substance use disorder among anesthesia care providers.

We will do our best to keep your information confidential. All data is stored in a password-protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Texas Woman's University representatives.

A separate link will be provided to participants who complete all portions of the study to be entered into a drawing to win one of five \$100 Amazon gift cards. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

If you have any questions about the research study, please contact:

Principal Investigator Katrina Vice O'Con at [kocon@twu.edu](mailto:kocon@twu.edu) or (318) 560-9761  
or  
Faculty Advisor Dr. Misty Richmond at [MRichmond4@twu.edu](mailto:MRichmond4@twu.edu) or (940) 898-2430

This research has been reviewed according to Texas Woman's University IRB procedures for research involving human subjects.

If you have any questions about your rights as a participant in this research or concerns regarding how this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at (940) 898-3378 or via email at [IRB@twu.edu](mailto:IRB@twu.edu).

ELECTRONIC CONSENT: Please select your choice below.

Selecting the "agree" button below indicates that:

you have read the above information  
you voluntarily agree to participate  
you are at least 18 years of age

If you do not wish to participate in the research study, please decline by selecting the "disagree" button.

☐ Agree

☐ Disagree



## APPENDIX H

### PERMISSION TO MODIFY AND USE PNII



College of Nursing  
Associate Dean for Research  
UK Medical Center  
501 College of Nursing Bldg.  
Lexington, KY 40536-0232

859 323-8076  
fax 859 323-1057  
www.uky.edu

25 October 2022

Katrina Vice O'Con, DNAP, CRNA, APRN  
PhD Student  
Texas Woman's University  
Denton, Texas

Dear Ms. O'Con,

Thank you for your recent request to use the Perceptions of Nursing Impairment Inventory (PNII) tool developed for the Nurses Assisting Nurses Project at the University of Kentucky College of Nursing in 1987. You are welcome to use this tool in your research project, but we do request that you acknowledge the 1987 publication (Hendrix, MJ, Sabritt, D, McDaniel, A and Field, B, "Perceptions and Attitudes toward Nursing Impairment," Research in Nursing & Health, 1987, Oct; 10(5): 323-333) in your final report as well as any subsequent publications from your work with this tool.

Best of luck with your graduate research.

Sincerely,

A handwritten signature in cursive script that reads "Thomas H. Kelly".

Thomas H. Kelly, PhD  
Associate Dean for Research and PhD Faculty Affairs

see blue.  
An Equal Opportunity University