Marian University

Leighton School of Nursing

Doctor of Nursing Practice

Final Project Report for Students Graduating in May 2023

Educating SRNAs on Substance Use Disorder Prevalence, Risk, and Prevention

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Dedication

This project is dedicated to all providers directly and indirectly impacted by substance use disorder (SUD) within the anesthesia profession. Traditionally this has been a controversial and taboo topic with underpinnings of mental health components that many providers prefer not to acknowledge. It is my hope that this research and accompanying information bring awareness and thoughtful change to anesthesia students' perception of SUD.

Acknowledgment

I would like to acknowledge my project chair Dr. Ranalli for mentoring and encouraging me to pursue this topic for my project. His passion for this topic has shown through during our many discussions regarding SUD, education, and clinical practice. I would also like to thank my project mentor and committee member Mr. Yant for allowing me to include my project in his course curriculum. I am thankful that his passion for SUD recognition and prevention in anesthesia providers matches my own passion for this topic.

Abstract

Background and Review of Literature: Substance use disorder (SUD) is increasing nationwide, including within the anesthesia provider community. Anesthesia providers are shown to be at an increased risk of developing SUD compared to other healthcare professionals. Detrimental effects on those under the care of an anesthesia provider with SUD can, and do, occur. Current Council of Accreditation (COA) guidelines necessitate the inclusion of limited SUD teaching to student registered nurse anesthetists (SRNAs), but professional organizations, such as the American Association of Nurse Anesthesiologists (AANA), recommend the provision of additional information.

Purpose: This DNP project's purpose was to provide education regarding SUD in anesthesia personnel via a virtual module to second-year SRNAs to increase prior knowledge and awareness on the topic.

Methods: This project utilized a quasi-experimental design and was evaluated by an expert-certified pretest/post-test questionnaire. A convenience sample was obtained using currently enrolled second-year SRNAs at Marian University in Indianapolis, Indiana.

Results: Thirty-two SRNAs participated in the project and 22 participants completed all questions in the pretest and post-test for a 69% completion rate. Pretest responses were matched with post-test responses. Using a paired t-test, the results show the provided education module significantly increased prior knowledge of SUD in the anesthesia profession ($p = <0.001$). Participants gained an average of 1.87 points (95% CI) on post-test scores after completing the module.

Implications/Conclusion: The introduction of an in-depth SUD education module increased SRNA's knowledge of SUD in the anesthesia profession. Enhancing SUD knowledge related to incidence, risk factors, warning signs, and prevention in anesthesia providers in training is recommended by experts to prevent providers' illicit use of substances, which can harm both providers and patients (Bell et al., 1999 & Booth et al., 2002). Further, increased awareness about SUD among anesthesia providers and the provision of available resources is beneficial to assist those affected by SUD.

Keywords: CRNA, "drug diversion", "medication diversion", anesthe*, "substance abuse", "drug dependence", diversion

Educating SRNAs on Substance Use Disorder Prevalence, Risk, and Prevention

This project is submitted to Marian University Leighton School of Nursing faculty as partial fulfillment of degree requirements for the Doctor of Nursing Practice, Certified Registered Nurse Anesthetist track. Substance use disorder is increasing in prevalence nationwide. One of every 12 Indiana residents is at risk of developing SUD (Indiana University Health, 2021). Evidence shows an increased incidence of SUD and diversion in the anesthesia profession relative to other medical professions and the general population. Substance use disorder is a long-standing problem affecting anesthesia professionals that has direct negative impacts on providers and patients, along with many other undesirable sequelae. Studies have shown the first years after provider immersion in the workforce are the most vulnerable to SUD (Alexander et al., 2000, Warner et al., 2013, & Wilson et al., 2008). Experts recommend better prevention support, including the use of high-quality, mandatory education. The purpose of this project was to provide education via a virtual module to second-year SRNAs.

Background

There are few studies involved in discovering the incidence of SUD and controlled substance misuse among anesthesia providers, including physicians, nurses, and students. Due to the limited literature, incidence ranges are broad. Bell et al. (1999) conducted the landmark comparative study of SUD in anesthesia providers and found a prevalence rate of 9.8% for controlled substance misuse in certified registered nurse anesthetists (CRNAs). Booth et al. (2002) found the prevalence to be 1.6% among medical residents and 1.0% among medical doctor (MD) anesthesia faculty throughout the study period of 12 years. A cross-sectional retrospective study by Bozimowski et al. (2014) found the 5-year prevalence of substance abuse

among SRNAs to be 0.65%. Warner et al. (2013) and Bell et al. (1999) found a higher prevalence of diversion and substance abuse among males in MD and CRNA groups, with 2.16 incidents per 1000 resident hours and 1 of every 10 male providers misusing controlled substances, respectively.

Alexander et al. (2000), Warner et al. (2013), and Wilson et al. (2008) found that newly licensed anesthesia providers were more likely to develop a SUD within the first 4 to 5 years following graduation. A review of this evidence supports the notion this is a vulnerable period for providers. One recommendation to decrease the incidence of SUD is to provide high-quality formal education on SUD that may better prepare clinicians entering the anesthesia profession. Studies by Bell et al. (1999) and Booth et al. (2002) show that mandatory formal education for SRNAs in this area is lacking and should be considered an important concept in preparation for entering the profession. Booth et al. (2002) found that only 47% of programs utilized a formal educational session related to SUD, and 31% of these programs did not mandate learners to complete the training. To provide education in this area, students should be offered education highlighting incidence, risk factors, recognition, and prevention.

Problem Statement

Second-year SRNAs at Marian University receive education in the form of discussions and article reviews related to substances of abuse in anesthesia professionals, along with issues surrounding reentry into practice after treatment. Although these exercises help bring general awareness to SUD, the adequate portrayal of the increased risks and grave consequences of SUD in the anesthesia profession may be lacking. Upon consent to participate, second-year SRNAs were required to complete a pretest followed by an online course module highlighting areas of SUD prevalence, risk factors, recognition, prevention techniques, and resources. Participants

were then administered a post-test after completion of the modules to determine the efficacy of instruction.

Gap Analysis

Although the current instruction was mandatory at the project site, it did not include a comprehensive overview, in-depth analysis of SUD, or align with recommended content, according to the American Association of Nurse Anesthesiology (AANA) (American Association of Nurse Anesthesiology, 2021). Clark (1994), in partnership with the AANA, completed an extensive study of best practices regarding the implementation of SUD into the content curriculum of anesthesia schools. The AANA accepted and promoted these recommendations centering on an array of detailed information about SUD risk, diagnosis, incidence, prevention, and treatment specific to anesthesia providers. Standards set by the Council of Accreditation (COA) for CRNAs including wellness strategies, detection of SUD, and reentry into the workplace after SUD treatment are present in the current curriculum (Council on Accreditation, 2015). The project's online educational module addressed the AANA recommendation deficits and provided information in accordance with the most recent literature.

Review of Literature

A review of the literature was completed to investigate incidence rates of SUD in anesthesia providers. Addiction is a widely prevalent problem in the United States today with about 21 million Americans suffering from at least one addictive substance (Yerby, 2019). Those working in the medical community are not spared from the risk of developing SUD. It is estimated that 15.4% of healthcare providers have SUD (Bryson, 2020). Anesthesia providers, including physician anesthesiologists, CRNAs, and trainees, are a subset of medical providers

that, due to a variety of factors, have a propensity for an increased rate of controlled substance diversion and subsequent abuse. Factors, although not all-inclusive, that may account for the increase in diversion rates and SUD in anesthesia providers are readily available potential drugs of abuse and the ease of access to highly potent medications, specialized knowledge of widely abused drugs that most other specialties in the medical community do not come in direct contact with, and repeatedly visualizing the effects on patients (Mayall, 2016).

Drug diversion, specifically in the anesthesia community, is a trending concern that impacts many critical areas such as patient safety, provider safety and wellness, community health related to viral outbreaks, medication and healthcare costs, trust in the profession, and other aspects. It is essential to have knowledge related to the prevalence of these issues to appreciate the full scope of the adverse effects related to SUD and drug diversion in the anesthesia community. Studies that outline factors leading to the tendency to divert and use controlled substances, the resulting problems associated with drug diversion and professional performance while under the influence, and the return to the anesthesia profession have been performed. There is a gap in the literature as to the prevalence of drug diversion and subsequent abuse in the anesthesia population. This led to the following PICO question to be developed: “In CRNA students, does the implementation of an education module increase the knowledge of substance use disorder in the anesthesia community?”

Literature Review Methods

This review had a primary focus to include articles with incidence rates of drug diversion in anesthesia professionals including physician anesthesiologists, CRNAs, and students in respective professions published between 1992 and 2020. Inclusion criteria consisted of primary

research, written in the English language, peer-reviewed, and human subjects. The search was conducted in PubMed with Search Mode: "BOOLEAN/Phrase". Primary search terms used include *CRNA OR anesthe*, drug diversion* OR *opioid diversion.* Using the BOOLEAN phrase "CRNA OR anesthe* AND *drug diversion* OR *opioid diversion",* 112 results were identified. In addition to these results, 5 articles were identified from other sources. Studies that were excluded were populations outside the anesthesia provider role, studies focused on risk factors associated with drug diversion, and studies focused on the prevention of drug diversion within the anesthesia provider role or other populations. After exclusion criteria were applied, 10 articles met the criteria for inclusion in this review. The literature review PRISMA diagram and matrix can be seen in Appendix A and B, respectively. This search was completed in October 2020.

Literature Review Results

Research Samples

Seven of the reviewed studies focused solely on CRNA or physician anesthesiologist populations, while 3 combined population groups. Booth et al. (2002) found the prevalence to be 1.0% among MD faculty and 1.6% among residents throughout the study period. Warner et al. (2013) and Bell et al. (1999) found a higher prevalence of diversion and substance abuse among males in MD and CRNA groups, with 2.16 incidents per 1000 resident hours and 1 of every 10 providers misusing controlled substances, respectively. Alexander et al. (2000) conducted research focused on accidental poisonings and suicide rates of anesthesiologists compared to internists. It was found that male anesthesiologists were 1.4 times more likely to die of drug-related causes than their internist peers (Alexander et al., 2000).

Timing of Diversion and Abuse

Alexander et al. (2000), Warner et al. (2013), and Wilson et al. (2008) collected data that concluded the highest prevalence of controlled substance diversion and abuse occurred within the first 4-5 years of training in an anesthesia program in both MD and CRNA groups. Bell et al. (1999) concluded the greatest prevalence in the CRNA group took place 6-10 years after the completion of training. Based on these data collections, it is recommended to focus on these time frames for additional vigilance, education, provision of resources, and risk mitigation strategies.

Drug of Choice

An alarming trend was noted in several studies regarding the preferred drug of choice throughout the years. The first documented propofol diversion and, more profound, dependence data, was reported by Follette & Farley (1992). Bell et al. (1999) found an increase in the use of benzodiazepines, inhalational, and propofol in the CRNA group starting during the mid-1990s, and Wischmeyer et al. (2007) discovered a propofol use incidence of 0.1% over 10 years between 1995 to 2005 in both MD and CRNA groups. In 2008, Wilson et al. published the first inhalational diversion and abuse study, using trainees of anesthesia programs, consultants, anesthesia technicians, and other operating room personnel. Results concluded consultants, trainees, and CRNAs were most at risk for abusing inhalational agents. It is noted by Bell et al. (1999), Wilson et al. (2008), and Wischmeyer et al. (2007) that, due to the highly detrimental method of action of propofol, benzodiazepines, and inhalational anesthetics, providers were often only found to have SUD once they were deceased.

Discussion and Implications for Practice, Education, and Research

Current research recognizes a lack of data related to the prevalence of controlled substance and anesthetic agent diversion with subsequent abuse rates in the United States and

worldwide by anesthesia providers. It is clear from the evidence provided these issues are a growing concern in the anesthesia community. Booth et al. (2002), Kintz et al. (2005), and Warner et al. (2013) cite a lack of data on anesthesiologists and CRNAs, along with their respective counterparts, as a limitation regarding comparable data on diversion and substance use. Due to the lack of longitudinal data, the rate and drug of choice trends are difficult to appreciate in both MD and CRNA groups. Another limitation is the inclusion of other substances of abuse, including alcohol, which may be a factor influencing data conclusions. Alcohol is not an agent prone to diversion in the anesthesia community, but it is included in some data as one of abuse.

Alexander et al. (2000) state the measures to prevent controlled and anesthetic substance diversion and abuse are inadequate. A change in current practice in anesthesia training programs and clinical areas should be instituted to slow and reverse the upward trend of diversion and SUD in the anesthesia community. Education plays a vital role in alerting trainees, providers, and peers of the prevalence of drug diversion and abuse in the profession. Booth et al. (2002) found that only 47% of programs utilized a formal educational session related to SUD, and 31% of these programs did not mandate learners to complete the training. Bell et al. (1999) and Booth et al. (2002) concluded education is lacking in these topics and speculate increasing educational requirements could benefit both trainees and clinicians. More research needs to be conducted to determine the relationship between the amount of education provided and completed related to positive diversion and abuse.

It is theorized a variety of risk factors may put anesthesia providers at increased risk for diversion and developing SUD. One prevention method that should be implemented into practice is prescreening using rigorous risk assessment strategies upon entry into training programs and

clinical areas. Bozimowski et al. (2014) and Collins et al. (2005) note that pre-enrollment screenings are inadequate in the current state. Collins et al. (2005) suggest the use of a pre-enrollment risk assessment tool as part of a standardized evaluation before entering anesthesia training. Policies should promote periodic drug screens throughout training and while in practice. Depending on the drug of choice, urine, blood, and hair toxicology can be examined to determine levels in the body (Follette & Farley, 1992; Kintz et al., 2005; Wischmeyer et al., 2007).

It is recommended that future research focus on prevalence studies within the anesthesia profession, including training programs and clinical positions (Kintz et al., 2005; Warner et al., 2013). Longitudinal data in areas of diversion and SUD, along with cofactors and outcomes, would be of help to determine the overall prevalence, long-term effects of SUD, and further areas that may be improved upon (Bell et al., 1999; Booth et al., 2002). Although Collins et al. (2005) recommend the use of a pre-enrollment risk assessment tool in practice, there is limited research concerning risk factors, and no available tool has been developed thus far.

Literature Review Conclusion

The available research acknowledges an upward trend in substance diversion and abuse with a worrisome trend toward propofol and inhalational drugs. Due to the devastating outcomes associated with improper use of the medications, it is recommended to increase the pre-enrollment risk factor and toxicology screening before admittance into an anesthesia training program, continue screening through the completion of training programs, and into professional provider clinical areas following employment. It is further recommended to ensure education regarding SUD is available, encouraged, and mandatory for anesthesia residents of all types during training.

Conceptual Framework

This project's conceptual framework was derived from Kotter's Model of Change. In 1996 John Kotter, author of "Leading Change", introduced the 8-step Model of Change after researching and interviewing staff at 100 organizations in the process of undergoing a change. Since the original work was published, Kotter further expounded on the topic and subsequently created an online learning platform. According to Kotter's 2021 revised online work, the 8 steps include creating urgency, building a strong guiding team, developing a vision, communicating for buy-in, empowering action, creating short-term wins, consolidating gains, and sustaining change. Each step has a particular focus and should be followed to encourage the effective use of the model.

The first step in Kotter's Model of Change, creating urgency, ensures the target population senses the need for change. Without realizing the need, people will not own the challenge of creating a change. Step 2 is to create a strong, influential team to guide the change process. A transformational leadership style to empower the change group and promote a positive environment in which to encourage the change process is beneficial (Marshal & Broome, 2017). Creating a strategic plan to guide a clear vision is step 3. A clear, concise vision is key as the project group is more likely to feel ownership and buy into the project (Appelbaum et al., 2012). A strategic plan involves determining goals and objectives, developing a timeline of events, and creating an evaluation plan (Kotter, 2021). Step 4 of Kotter's Model of Change is appealing for buy-in to the group by communicating the importance and impacts of the project. Communication is critical throughout the project, especially during the appeal for change agents, and can positively or negatively affect outcomes. If effectively performed, this step reduces uncertainty and ambiguity while steering the project toward positive outcomes (Appelbaum et

al., 2012). Empowering individuals to jump into action is step 5. This step acts to reduce obstacles that may hinder change agents during the process. Communication continues to be critical in this step as open discussions about obstacles, solutions, and follow-through are generally all that is required to promote forward momentum. Step number 6 involves creating short-term wins to validate that the efforts of participants are paying off. Visualizing these wins helps ensure sustainability in participants, along with a renewed effort to continue endeavors of change (Appelbaum et al., 2012). Consolidating gains in step 7 refers to the process of taking each short-term win into account to prove the efficacy of the desired change and then using this force to promote the forward energy of the project. This step helps sustain continuous improvement during the project by encouraging supporters and converting cynics into advocates (Kotter, 2021 & Appelbaum et al., 2012). The final step, step 8, endeavors to anchor the change in the culture of the organization. This step relates project successes to positively correlated results, maintains visibility in the environment, and ensures continued support by organizational leaders.

Following Kotter's 8-step Model of Change provides a solid foundation and direction for the change outcome sought by this project. An urgency to present information and encourage perception shift was acknowledged by instructors and recognized by participants once the module is accessed. This project's team provided a strong leadership group that facilitated the target site's structure change as well as individual participants' approach to SUD. The project's vision was evident in the problem statement and specific objectives. Project leadership ensured open communication was offered to support participant buy-in. Action was empowered in multiple ways: providing transformational leadership style, open communication, and empowering participants to create change within as an individual and throughout the anesthesia

community. The educational module had built-in reflection points to promote short-term wins for participants. Upon completion of the module, short-term wins were recognized so individuals felt confident in the knowledge and benefits of change. Finally, change sustainment occurs at an individual level due to increased SUD risk assessment knowledge and confidence in abilities to identify SUD in peers. Change at the program site is intended to be sustained as the use of this project and educational module will continue to be available to course instructors after project completion.

Goals, Objectives, and SWOT Analysis

This DNP project aimed to determine if providing second-year SRNAs with education regarding SUD in anesthesia personnel increased prior knowledge on the topic. The project's specific objectives were to:

1. enhance second-year SRNAs' knowledge of SUD incidence in the anesthesia profession by 25%
2. enhance knowledge of risk factors by 25%
3. provide signs to watch for in peers suspected of misusing
4. discuss prevention measures
5. provide resources for individuals affected by SUD

A SWOT analysis was performed for this DNP project. Strengths included in-depth information dedicated to SUD in an easily accessible and flexible Canvas module and a strong project team targeting participants at Marian University. Weaknesses included a potentially increased time commitment for the project module versus merely completing work in the previously designed class structure. An opportunity for this project is the retention of information that the target audience is likely to achieve due to being in a learning mindset during the

completion of graduate coursework. Other opportunities include the expounding on the potential limited exposure to SUD by second-year SRNAs and the creation of a Wellness Committee, unrelated to the project, at the target site, which may reinforce the importance of the project. Threats to this project include participant stress and information overload related to other coursework, the requirement of online learning adaptability, and technology issues with the internet or Canvas infrastructure.

Project Design

Project Site and Sample

The site for this project was Marian University. The project's educational intervention was inserted into an existing course, Nursing 615 Anesthesia Seminar 1, which was taught by this project's faculty mentor Greg Yant MSN, CRNA. Historically, this course introduced provider well-being and chemical dependency in anesthesia providers.

This project gathered a convenience sample of 32 second-year CRNA students enrolled in courses on track for completing a 3-year Doctor of Nursing Practice degree. Students were in the fourth of 9 total semesters, enrolled in Nursing 615 Anesthesia Seminar 1, and had completed all prerequisites. Students not meeting these criteria were excluded from data collection.

Methods

Before developing this quasi-experimental project, an exemption was obtained from Marian University's Institutional Review Board (IRB), after which the educational curriculum module was developed. This qualitative project utilized a pretest/post-test design for an educational intervention in which the entire cohort was invited to participate over a 4-week

period. The curriculum was offered at the beginning of the semester to reduce bias brought on by other coursework related to SUD. The course curriculum was developed utilizing the most up-to-date evidence-based research on all 5 module topics: prevalence, risk factors, signs of SUD, prevention, and resources for SUD victims. The pretest was required to be completed before advancement through the modules. Pretest scores were matched with post-test scores upon completion of data collection.

Measurement Instrument

A knowledge assessment pretest/post-test measurement instrument was administered to participants in this project. A set of demographic questions was administered during the pretest survey to discover more information on the population. The demographic questions included age range, sex, and years of experience working as a registered nurse. Semester or year within the nurse anesthesia program was not included as all invited participants were from the same cohort. The pretest and post-test consisted of the same content knowledge questions and included 4 single answer questions and 3 multiple answer questions for a total of 7 questions. This project's chair and expert in the anesthesia field, Dr. Ranalli, established the validity of the content in the pretest/post-test and material in the educational module. See Appendix F for the pretest/post-test and Appendix G for an outline of the course material.

Data Collection

The education module included an external link to Qualtrics surveys for the pretest, including demographic information, as well as for the post-test once the module was completed. This DNP student collected all data upon completion of the 4-week period in which the module was available for project participation. All responses remained confidential and anonymous.

Data Evaluation

The results gathered through Qualtrics from the pretests were compared to the results of post-tests using a paired t-Test statistical analysis conducted through SPSS software. The project's results were disseminated to participants and available to the public upon project completion.

Ethical Considerations

Approval for exempt status from the IRB was obtained before initiating this DNP project. Participation in this project was voluntary, as noted in the consent section of the demographic and pretest survey, and did not affect the final grade for this course. Confidentiality and anonymity were maintained during and after the project. The anonymous results were only available to this DNP student via a password-protected computer. Data was deleted upon completion of project dissemination. There were no foreseen risks to participation in this project.

Analysis

Data were analyzed using descriptive statistics. Variability, frequency, and central tendency measures were included in the analysis. Frequency tables were utilized for all categorical and numerical data points. IBM SPSS Statistics (Version 27) was used to perform all statistical analyses.

Results

A total of 32 second-year students were eligible and enrolled in this project. All participants enrolled completed at least partial work in the project. Upon completion, 22 functional data points were obtained (n= 22). Of the total respondents, 7 participants neglected to

complete all information for the pretest, and 5 neglected to complete all information in the post-test for a 69% completion rate. Most respondents (59.1%) were female, were between 22-29 years of age (45.5%), and have practiced as registered nurses for less than 5 years (50%). Please see Table 1 below to view survey respondent demographics.

Table 1
Demographics and Characteristics of All Survey Respondents

Characteristics	n	%
Gender		
Male	9	40.9
Female	13	59.1
Age		
22-29	10	45.5
30-39	9	40.9
40-49	3	13.6
Experience as a Registered Nurse (years)		
<5	11	50
6-10	8	36.4
11-15	2	9.1
16-20	1	4.5

**Note, n= 22*

Knowledge Assessment Pretest and Post-Test Results

Upon completion of demographic characteristic questions in the pretest, students were asked 7 questions about SUD content to ascertain baseline SUD knowledge. Please see Table 2 below for questions, correct answers, and correctly answered percentages for the pretest and post-test. The mean pretest knowledge total score was 3.18, while the mean post-test total score was 5.05. Post-test final scores reveal a significant increase averaging 1.87 points (95% CI, t= 5.23 p <0.001) in SUD knowledge after completing the course content. Table 3, seen below and in Appendix I, illustrates statistical analysis performed using SPSS software. The effect size is

1.58, which means the post-test scores are more than one standard deviation better than the pretest total scores. This correlates to a high effect size.

Table 2

Results of the Survey

Question	Correct Answer	Pretest No. (%) Correct	Post-test No. (%) Correct
What is the prevalence of SUD in healthcare professionals?	15%	59.1	86.4
What is the prevalence of SUD in anesthesia professionals?	Up to 20%	18.2	77.3
What are the most commonly abused anesthetic agents among anesthesia professionals? (pick 2)	Opioids, Propofol	36.4	90.9
What are risk factors associated with increased incidence of SUD in anesthesia personnel? (pick 3)	Frequent visualized efficacy of anesthetics, History of trauma, Family history of substance abuse	13.6	36.4
What are signs of SUD in anesthesia providers? (pick 3)	Behavior changes, Personal appearance decline, Difficulty with concentration and memory	59.1	86.4
Which of the following is NOT an evidence-based intervention to prevent SUD in anesthesia personnel?	For-cause drug testing	27.3	45.5
What resources are available to assist victims of SUD?	All of the above	100	95.5

Table 3 Statistical Analysis: Paired Samples Test

Paired Samples Test

		Paired Differences							Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	One-Sided p	Two-Sided p
Pair 1	Pretest Score - Post-test Score	-1.864	1.670	.356	-2.604	-1.123	-5.233	21	<.001	<.001

Summary

A total of 32 SRNAs participated in the pretest, course, and post-test, giving a completion rate of 100%. After eliminating participant data with incomplete information, a total of 22 participants (69%) provided usable data for this project. Overall, respondents had a statistically significant increase in the percentage answered correctly on most questions in the post-test with an increase of 1.87 points (95% CI, $p < 0.001$) on total scores.

Discussion

All anesthesia providers are directly or indirectly impacted by SUD in the provider community. The need for mandatory, quality information regarding SUD is recommended in anesthesia training, yet the majority of programs do not mandate this education (Booth et al., 2002). Data supports most anesthesia providers with SUD are newly licensed providers within

the first 10 years of training completion, and the majority are discovered within the first 5 years (Alexander et al., 2000, Bell et al., 1999, Warner et al., 2013, and Wilson et al., 2008). Trainee awareness and education related to SUD in anesthesia providers have been recommended as one way to decrease detrimental impacts on providers and patients.

This project aimed to increase SRNA knowledge of various aspects of anesthesia provider SUD by comparing baseline pretest knowledge to total scores after a virtual education course was completed. The goal to increase overall SUD knowledge and risk factors related to SUD by 25% upon the completion of the module was met and exceeded. Additional objectives of information provision associated with symptom recognition, prevention measures, and available resources were also met. Post-test scores following completion of the SUD educational module show an increase in knowledge of baseline levels in second-year Marian University SRNAs.

Conclusion

The findings of this project will help bridge the SRNA knowledge gap of anesthesia provider SUD by utilizing an educational module comprising SUD incidence, risk factors, warning signs, prevention, and resources. One recommended path anesthesia educators can take to prevent further increases in first-time use and relapse rates of anesthesia provider SUD is by raising awareness related to the higher risk and incidence of SUD in those completing training. This project demonstrates positive results of using a virtual format to accomplish this recommendation. Further recommendations discovered during this project include completing additional research into risk assessment strategies in perspective anesthesia trainees and the development of wellness strategies aimed toward SUD risk mitigation.

References:

Alexander, B. H., Checkoway, H., Nagahama, S. I., & Domino, K. B. (2000). Cause-specific mortality risks of anesthesiologists. *Anesthesiology*, *93*(4), 922–930. https://doi.org/10.1097/00000542-200010000-00008

American Association of Nurse Anesthesiology (2021). *Addressing substance use disorder for anesthesia professionals: Position statement and policy considerations*. Retrieved December 14, 2021, from https://www.aana.com/docs/default-source/practice-aana-com-web-documents-(all)/professional-practice-manual/addressing-substance-use-disorder-for-anesthesia-professionals.pdf?sfvrsn=ff0049b1_10

Appelbaum, S. H., Habashy, S., Malo, J. L., & Shafiq, H. (2012). Back to the future: Revisiting Kotter's 1996 change model. *Journal of Management Development*, *31*(8), 764–782. https://doi.org/10.1108/02621711211253231

Bell, D.M., McDonough, J.P., Ellison, J.S., & Fitzhugh, E.C. (1999). Controlled drug misuse by Certified Registered Nurse Anesthetists. *AANA Journal*, *67*(2), 133-40. Retrieved from https://pubmed.ncbi.nlm.nih.gov/10488287/

Booth, J., Grossman, D., Moore, J., Lineberger, C., Reynolds, J., Reves, J. G., & Sheffield, D. (2002). Substance abuse among physicians: A survey of academic anesthesiology programs. *Anesthesia & Analgesia*, *95*, 1024-1030. https://doi.org/10.1213/00000539-200210000-00043

Bozimowski, G., Groh, C., Rouen, P., & Dosch, M. (2014). The Prevalence and Patterns of Substance Abuse Among Nurse Anesthesia Students. *AANA Journal, 82*(4), 277–283. Retrieved from https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=97ba5641-29a6-46ef-b220-99d1eabb6627%40redis

Bryson, E. (2020). The impact of chemical dependency on health care professionals involved with the delivery of anesthesia. *International Anesthesiology Clinics*, *58*(1), 45-49. http://doi.org/10.1097/AIA.0000000000000257

Clark, G. (1994). *A model didactic and clinical substance abuse curriculum developed for schools of nurse anesthesia*. Retrieved from https://www.aana.com/docs/default-source/wellness-aana.com-web-documents-(all)/clark_model_substance_abuse_curriculum94fbd526731dff6ddbb37cff0000940c19.pdf?sfvrsn=862c4bb1_2

Collins, G., McAllister, M., Jensen, M., & Gooden, T. (2005). Chemical dependency treatment outcomes of residents in anesthesiology: Results of a survey. *Anesthesia & Analgesia*, *101*, 1457-1462. https://doi.org/10.1213/01.ANE.0000180837.78169.04

Council on Accreditation. (2015, January 23). *Accreditation standards, policies and procedures, and guidelines*. Standards For Accreditation of Nurse Anesthesia Programs: Practice Doctorate. Retrieved August 21, 2022, from https://www.coacrna.org/accreditation/accreditation-standards-policies-and-procedures-and-guidelines/

Follette, J., & Farley, W. (1992). Anesthesiologist Addicted to Propofol. *Anesthesiology*, *77*(4), 817-818. https://doi.org/10.1097/00000542-199210000-00028

Indiana University Health. (2021). *The crisis in Indiana*. Addictions. Retrieved December 14, 2021, from https://addictions.iu.edu/understanding-crisis/crisis-in-indiana.html

Kintz, P., Villain, M., Dumestre, V., & Cirimele, V. (2005). Evidence of addiction by anesthesiologists as documented by hair analysis. *Forensic science international*, *153*(1), 81–84. https://doi.org/10.1016/j.forsciint.2005.04.033

Kotter, J. (2021). *The 8-step process for leading change*. Kotter. Retrieved January 29, 2022, from https://www.kotterinc.com/8-step-process-for-leading-change/

Marshal, E.S. & Broome, M.E. (2017). Transformational leadership in nursing: From expert clinician to influential leader (2nd ed.). New York: Springer Publishing Company.

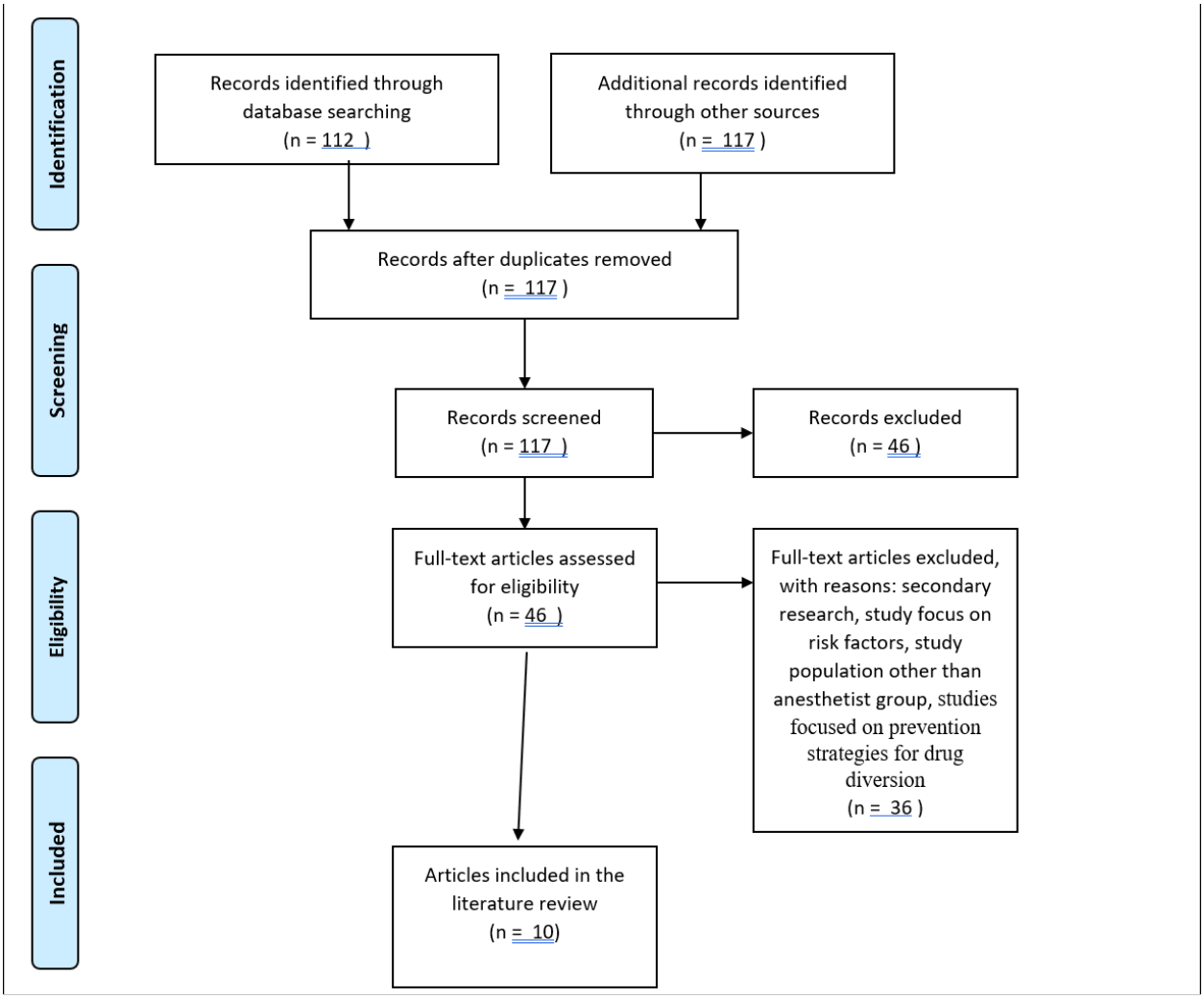
Mayall, R.M. (2016) Substance abuse in anaesthetists. *BJA Education*, *16*(7), 236–241. https://doi.org/10.1093/bjaed/mkv054

Warner, D. O., Berge, K., Sun, H., Harman, A., Hanson, A., & Schroeder, D. R. (2013). Substance use disorder among anesthesiology residents, 1975-2009. JAMA, 310(21), 2289–2296. https://doi.org/10.1001/jama.2013.281954

Wilson, J.E., Kiselanova, N., Stevens, Q., Lutz, R., Mandler, T., Tran, Z.V., & Wischmeyer, P.E. (2008). A survey of inhalational anaesthetic abuse in anaesthesia training programmes. *Anaesthesia*, *63*(6), 616-20. https://doi.org/10.1111/j.1365-2044.2008.05444.x

Yerby, N. (2019, June). *Addiction statistics*. Addiction Statistics. Retrieved August 21, 2022, from https://www.addictioncenter.com/addiction/addiction-statistics/

Appendix A



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Appendix B

Reference	Research Design & Level of Evidence	Purpose / Aim	Population / Sample n=x	Variables	Instruments / Data collection	Results	Implications for future research	Implications for future practice
Alexander, B. H., Checkoway, H., Nagahama, S. I., & Domino, K. B. (2000). Cause-specific mortality risks of anesthesiologists. *Anesthesiology*, *93*(4), 922–930. https://doi.org/10.1097/00000542-200010000-00008	Case Control	"The health-related effects of the operating room environment are unclear."	N= 40,285 anesthesiologists n= 40,269 internists. All born before January 1, 1979 and graduated medical school by December 31, 1995	Specialty, age (decade of birth), gender, cause of death, citizenship status, race	The data was compiled from the Physician Master File (PMF) maintained by the American Medical Association. Results yielded almost 3 times as many internists, therefore a stratified random sample was selected as a comparison group.	Male anesthesiologists experienced a 34% excess risk of death from an accidental poisoning compared with the general population. Mortality rates resulting from suicide were 50% greater for anesthesiologists and the rate ratio for drug related suicide was more than double. All drug-related deaths rates for anesthesiologists were 2.79 times higher than in the internist group. HIV-related deaths, and cerebrovascular disease were higher for anesthesiologists compared with internists. Rates of death were greatest in the first 5 years after graduation for both groups and gradually declined with increasing years of practice.	Continued attention to drug misuse among anesthesia providers is warranted, although no specific direction is identified.	Death rates by anesthesiologists continue to be elevated despite introduction of increased awareness and formal education regarding occupational hazards of drug abuse indicating current preventive measures are inadequate.

Bell, D.M., McDonough, J.P., Ellison, J.S., & Fitzhugh, E.C. (1999). Controlled drug misuse by Certified Registered Nurse Anesthetists. *AANA Journal*, *67*(2), 133-40.	Correlational study	"The primary purpose of this study was to determine the prevalence of controlled drug misuase among actively practicing Certified Registered Nurse Anesthetists (CRNAs). A second purpose was to determined variance in controlled drug misuse by the variables of age, sex, population and geographic area of residence, type of anesthesia position currently held, and number of years in anesthesia practice."	N= 167 CRNAs with history or current use of controlled substances	Age, years of practice, sex, type of controlled substance	Survey	167 CRNAs admitted history or current use of controlled substances and 62.9% were represented by males with 6-10 years of clinical practice. A chi-square test revealed a significant relationship between likelihood of misuse and variables of sex and number of years in anesthesia practice. 9.8% admitted to misuse (diversion from patient). Controlled drugs of choice have trended from opioids to inhalation agents, benzodiazepines, and propofol. Dissociative drugs, narcotic agonist-antagonists, and barbiturates declined significantly.	A longitudinal study to clearly delineate the issue of CRNA drug misuse with variables of illicit and uncontrolled drug use and misuse-associated behavior would be ideal.	Strengthening education and prevention-use of this study as a needs assessment for CRNAs, educating SRNAs for potential occupational hazards for addictive behavior, creation of SRNA student support systems
Booth, J., Grossman, D., Moore, J., Lineberger, C., Reynolds, J., Reves, J. G., & Sheffield, D. (2002). Substance abuse among physicians: A	Comparative Descriptive design	"In this study, we sought to examine whether there have been changes in the incidence of CS	N = 133 residents with substance use disorder n= 34 faculty with substance	Drug used, type/amount of formal drug abuse education, method of	Survey	133 of 8111 residents and 34 of 3555 faculty members in 123 anesthesiology programs nationwide were identified to have a substance abuse disorder. 18% died or	Studies verifying regional and national data on controlled substance abuse in anesthesiologists are needed to verify this study results	A valuable tool to help identify anesthesiologist who are using controlled substances may be the addition of random drug

survey of academic anesthesiology programs. *Anesthesia & Analgesia, 95*, 1024-1030. https://doi.org/10.1213/00000539-200210000-00043		abuse since 1990 and whether education and regulation policies designed to reduce CS abuse have been adopted on a widespread scale."	use disorder	dispensing/disposing/accounting for controlled substances		required resuscitation before abuse was suspected. The population found to be abusers remained stable from prior studies. Formal drug abuse education was present in 47% of the programs but only 69% required completion. Education had been shown to increase during the study period. 63% of programs had made changes to dispensing, disposing and waste procedure in the study timeframe. 8% of programs utilized random drug urine testing in the population.	and would be valuable as a trending measure	screens. A national registry to measure outcomes of addiction reduction programs should be implemented.
Bozimowski, G., Groh, C., Rouen, P., & Dosch, M. (2014). The prevalence and patterns of substance abuse among nurse anesthesia students. *AANA Journal*, *82*(4), 277-83.	Cross-sectional retrospective study	"The purpose of this study was to assess the prevalence, demographic factors, outcomes, and preventative measures for substance abuse among nurse anesthesia students over a 5-year period from 2008 to 2012."	N= 16 SRNAs identified as having substance abuse	Type of drug misused, pre-enrollment risk factors, outcomes	Survey	Of 2,439 SRNAs, 16 incidents were identified, with opioids as the most frequent drug of choice (n=9). Outcomes included 10 entered into voluntary treatment, 7 were dismissed from the program, 2 lost nursing licenses and 1 death occurred. Most reported screening included pre-enrollment background checks and drug	Further research regarding proactive risk assessment postgraduation and evaluation of wellness promotion effort effectiveness for risk reduction	The authors suggest faculty should be more active in promoting wellness programs if further research identifies effectiveness. It was also noted currently used screening processes may not be adequate to identify students with risks unless a background check identifies prior

						screens. Prevalence rates were found to be lower in SRNAs vs. CRNAs.		substance abuse.
Collins, G., McAllister, M., Jensen, M., & Gooden, T. (2005). Chemical dependency treatment outcomes of residents in anesthesiology : Results of a survey. *Anesthesia & Analgesia*, *101*, 1457-1462. https://doi.org/10.1213/01.ANE.0000180837.78169.04	Longitudinal observational study	"We performed this study to determine if improvement has been made in the treatment outcomes of residents in anesthesiology compared with earlier studies."	N= 199 anesthesiology residents treated for substance abuse	Type of drug misused, outcomes	Survey with follow up of treated residents years later	80% of responding anesthesia resident programs had experience with at least 1 impaired trainee, which constitutes the largest percentage to date. Of the residents treated for chemical dependency, 92% resumed anesthesia training, with only 59% successful in completing training. Residents were followed long term and 56% were found to be successful in the practice of medicine, but it could not be determined what percentage stayed in anesthesia. 16% were found to leave medicine entirely after treatment.	Research regarding the impact of pre-employment toxicology on the incidence of abuse is lacking	Few programs were found to prescreen for substance abuse or perform pre-employment toxicology. A more proactive approach may be of benefit, considering the prevalence of substance abuse in medicine and especially in the practice of anesthesiology. The use of risk assessment tools should be considered when interviewing potential residents for anesthesiology programs. Redirection of treated residents into a lower risk specialty should be considered.
Follette, J., & Farley, W. (1992). Anesthesiologist Addicted to Propofol. *Anesthesiology*, *77*(4), 817-818. https://doi.org/10.1097/00000542-199210000-00028	Case Study	"This is a case report on an anesthesiologist who abused and became dependent on propofol."	N= 1 anesthesiologist with propofol abuse	None	Case report of one anesthesiologist	An anesthesiologist was determined to be diverting and abusing propofol after being found unconscious in a bathroom at work. The case study contains drug abuse risk factors,	None identified.	Hospitals should know about the resources available for drug abusing/diverting providers. The importance of monitoring programs for treatment

						incidence of starting propofol abuse and developing dependence. This is the first studied event of propofol dependence.		programs is discussed, as well as the information that propofol and its metabolites are identifiable in urine toxicology screens.
Kintz, P., Villain, M., Dumestre, V., & Cirimele, V. (2005). Evidence of addiction by anesthesiologists as documented by hair analysis. *Forensic science international*, *153*(1), 81–84. https://doi.org/10.1016/j.forsciint.2005.04.033	Case Study	"This report presents four authentic cases of anesthesiologists addicted to fentanyl derivatives where evidence was given by hair testing."	N= 4; 3 living anesthesiologists and 1 deceased nurse anesthetist determined to use controlled substances	Sampling of hair via drug analysis, urine drug screens performed/number of negatives, narrative background on work performance	Collection of hair samples from 3 living participants in medico-legal cases and 1 sample collected post mortem	All 4 samples contained traces of substances of abuse, including amounts that correlate to term of use whereas urine toxicology failed to register the presence of any substance of abuse.	The problem of drug use in the anesthesia profession is not widely recognized and more prevalence studies would be of benefit.	The practice of hair analysis over blood or urine toxicology tests point to a more accurate testing method, is easy, cost-effective, and can be directly witnessed to deter tampering.
Warner, D. O., Berge, K., Sun, H., Harman, A., Hanson, A., & Schroeder, D. R. (2013). Substance use disorder among anesthesiology residents, 1975-2009. *JAMA*, *310*(21), 2289–2296. https://doi.org/10.1001/jama.2013.281954	Retrospective cohort study	"To describe the incidence and outcomes of SUD among anesthesiology residents."	N= 384 residents reported to have a substance use disorder while in training	Cases of substance use disorder including initial event and relapse, vital status, cause of death, and professional consequences	Review of American Board of Anesthesiology (ABA) records for "substance use disorder" (SUD) flag	Of 44,612 who had been enrolled in anesthesia training, the SUD flag was set for 1042 cases and confirmatory evidence was available for 842 cases. As this study focuses on residents, 384 cases were identified, including 26 deaths within 4 years of starting training. This represents 0.86% of those who began primary training in anesthesia. 8% were women,	In general, more data is needed in this subject matter to better guide policy and practice. Comparable data for other physician specialties is lacking, which would help determine if SUD is more prevalent in the anesthesia profession.	None noted

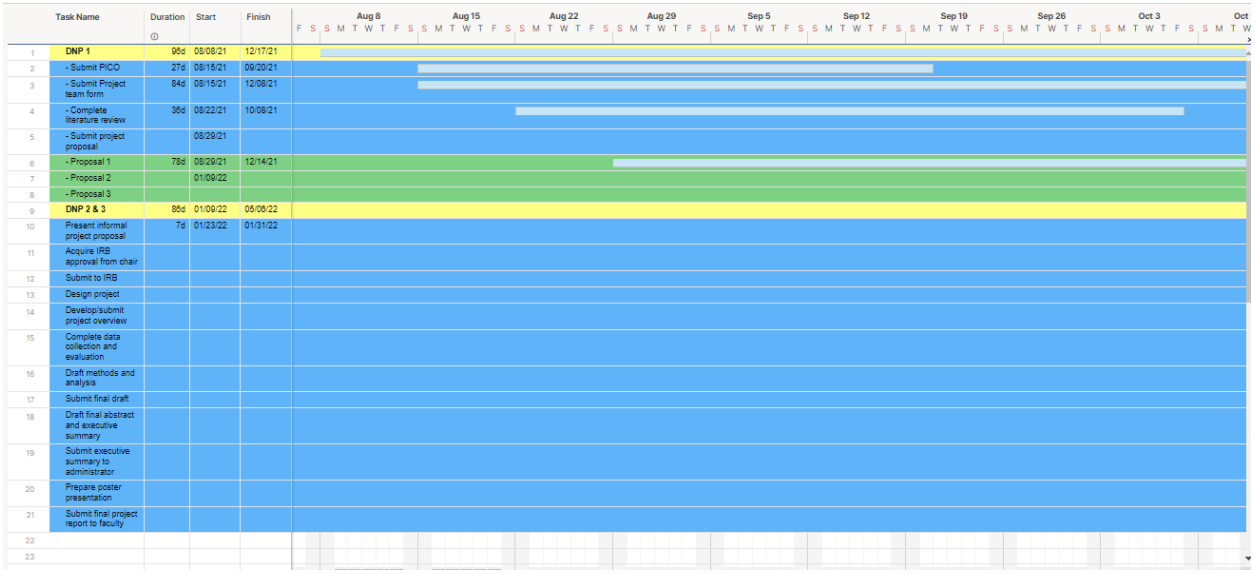
						median age was 31, overall incidence was 2.16 per 1000 resident years with 177,848 resident-years analyzed. SUD history before residency was found in 56 individuals. The most common substance was IV opioids. 91 individuals relapsed at least once, and 6% did so in training.		
Wilson, J.E., Kiselanova, N., Stevens, Q., Lutz, R., Mandler, T., Tran, Z.V., & Wischmeyer, P.E. (2008). A survey of inhalational anaesthetic abuse in anaesthesia training programmes. *Anaesthesia*, *63*(6), 616-20. https://doi.org/10.1111/j.1365-2044.2008.05444.x	Cross-sectional retrospective study	"This study aims to assess the prevalence and outcomes of inhalational anaesthetic abuse among anaesthesia training programmes."	N= 31 trainees identified to be abusing inhalational anesthetics	Type of inhalational anesthetic abused, personnel type (consultant, trainee, CRNA, technician, other), population abusing inhalation anesthetics, deaths, those sent to rehab, successful completion of rehab, return to specialty with relapse, change in specialty, those that left medicine	Survey	This is the first published study of abuse of inhalational anesthetics. Surveys were sent to 126 anesthesia program directors with a response of 106 (84%). 22% of responding programs had at least 1 incidence of abuse. 15/31 identified trainees were sent for rehab and only 7 of those were able to successfully return to practice anesthesia. 97/104 departments did not have a pharmacy accounting program for the inhalational anesthetics. Overall mortality was 26%. Trainees and CRNAs were	Further studies may be needed to determine predisposing addictive risk factors.	Prevention needs to be a more prevalent practice and focus should be in the first 5 years after graduation. Risk factor assessment should be implemented.

						reported the most frequently.		
Wischmeyer, P., Johnson, B., Wilson, J., Dingmann, C., Bachman, H., Roller, E., Tran, Z. V., & Henthorn, T. (2007). A survey of propofol abuse in academic anesthesia programs. *Anesthesia & Analgesia*, *105*, 1066-1071. https://doi.org/10.1213/01.ane.0000270215.86253.30	Cross-sectional retrospective study	"With this supporting information for the abuse potential of propofol, we attempted to determine the prevalence and outcome of propofol abuse in academic anesthesiology department with residency training programs in the United States."	N= 25 abuse events, including attending physicians, residents, CRNAs, and OR/anesthesia technicians	Propofol identified as drug of choice, type of anesthesia provider, pharmacy accounting of propofol, year of abusers birth, year abuse was identified, how abuse was discovered, outcome of abuser (alive/deceased), 36nterve ntion outcome, years in anesthesia, comorbid psychiatric conditions, past substance abuse/family history, relapse status	Survey to identify propofol abusers in a 10-year period	Of 126 programs surveyed, 25 propofol abuse events occurred in 23 programs among attending physicians, residents, CRNAs, and OR/Anesthesia technician. 7 deaths were reported, propofol abuse was not evident until the time of death. The incidence among all anesthesia personnel (attendings, residents, CRNAs= 23,385) was 0.1% for 10 years. 18 departments intervened with propofol abusers: 13 volunteered for rehab. 6 returned to anesthesia (3 then relapsed), 5 changed specialty, 10 left medical practice. Pharmacy regulation of propofol was studied: 90 of 126 institutions did not regulate propofol. Positive diversion/abuse was significantly associated with no control measures with propofol.	Further research should be completed to outline the attraction of propofol used as a drug of choice. The potential for aerosolization of propofol should be examined.	Pharmacy accounting of propofol in institutions should be instituted. Urine toxicology including propofol should be utilized in at-risk or suspected individuals. Early identification of individuals abusing propofol is key to limiting morbidity and mortality.

Appendix C

Strengths: • In-depth information dedicated to SUD • Flexible course • Strong project team • Project site at Marian • Canvas site ease of use • Accessible 24/7	**Opportunities:** • Target audience is already in learning mode • Second-year SRNAs have little exposure to SUD • Creation of the developing Wellness Committee could reinforce project importance
Weaknesses: • Increased time commitment versus previous structure	**Threats:** • Stress • Information overload related to other coursework • Online learning required • Technology issues- internet or Canvas

Appendix D



	Task Name	Duration	Start	Finish
1	**DNP 1**	96d	08/08/21	12/17/21
2	- Submit PICO	27d	08/15/21	09/20/21
3	- Submit Project team form	84d	08/15/21	12/08/21
4	- Complete literature review	36d	08/22/21	10/08/21
5	- Submit project proposal		08/29/21	
6	- Proposal 1	78d	08/29/21	12/14/21
7	- Proposal 2		01/09/22	
8	- Proposal 3			
9	**DNP 2 & 3**	86d	01/09/22	05/08/22
10	Present informal project proposal	7d	01/23/22	01/31/22
11	Acquire IRB approval from chair			
12	Submit to IRB			
13	Design project			
14	Develop/submit project overview			
15	Complete data collection and evaluation			
16	Draft methods and analysis			
17	Submit final draft			
18	Draft final abstract and executive summary			
19	Submit executive summary to administrator			
20	Prepare poster presentation			
21	Submit final project report to faculty			
22				
23				

Appendix E

You are invited to participate in an investigative project titled *Educating SRNAs on Substance Use Disorder Prevalence, Risk, and Prevention*. This project is being conducted by Kursten Smith (primary investigator) from Marian University in fulfillment of her DNP graduate project. You were selected to participate in this project because you are a second-year student, enrolled in the nurse anesthesia program at Marian University, and registered to take Nursing 615 Anesthesia Seminar 1. The purpose of this project is to provide SRNAs with a comprehensive overview of substance use disorder (SUD) in anesthesia professionals. If you agree to take part in this project, you will be asked to complete the survey on the next page. This survey will ask about your current knowledge of SUD. It will take you approximately 3 minutes to complete. Your answers in this project will remain confidential and results will be reported in the aggregate. Confidentiality will be maintained, and risks of breaches will be minimized by data storage in a password-protected computer securely kept with the primary investigator and the data will be deleted upon completion of the project.

Your participation in this project is voluntary. You may withdraw from the project at any time. You are free to skip any question you choose. Withdrawal from the project does not affect your course grade.

If you have questions about this project or if you have any issues with the project, you may contact the primary investigator, Kursten Smith at (765) 702-1155. If you have any questions concerning your rights as a project subject, you may contact the Marian University Institutional Review Board Chair, Dr. Amanda C. Egan at aegan@marian.edu or irb@marian.edu.

By completing the pre-survey, you are indicating that you are at least 18 years old, have read and understood this consent form, and agree to participate in this project.

I understand and agree to continue

Appendix F

Please select your age bracket:

- 22-29
- 30-39
- 40-49
- ≥50

Please select your gender

- Male
- Female
- Nonbinary
- Prefer not to say

How many years of professional experience do you have?

- ≤ 5 years
- 6-10 years
- 11-15 years
- 16-20 years
- ≥ 20 years

What is the prevalence of SUD in healthcare professionals?

- 1%
- 15%
- 25%
- 50%

What is the prevalence of SUD in the healthcare subset of anesthesia professionals?

- 10%
- 15%
- 25%
- 50%

What are the most commonly abused substances in anesthesia professionals (pick 2)?

- Benzodiazepines
- Opioids
- Alcohol
- Ketamine
- Propofol

-What are risk factors associated with increased incidence of SUD in anesthesia personnel? (Pick 3)

- Increased pharmacy oversight
- Frequent visualized efficacy of anesthetics
- Age <30

- History of trauma
- Family history of substance abuse
- 15+ years in the anesthesia profession

-What are signs of SUD in anesthesia providers? (Pick 3)

- Behavior changes
- Personal appearance decline
- Highly reliable in job performance
- Quickly accomplishes tasks
- Simple excuses for errors
- Difficulty with concentration and memory

-What is NOT a way to prevent SUD in anesthesia personnel?

- For-cause drug testing
- Chart analysis/auditing
- Adequate provider self-care
- Return bins with availability to quantitatively test deposited drugs

-What resources are available to assist victims of SUD?

- AANA Peer Assistance Helpline **800-654-5167**
- Anesthetists in Recovery (AIR)
- Employee Assistance Program (EAP) through the workplace
- All of the above

Appendix G

1.) *Objectives – By the end of this workshop, learners will:*

-Understand the incidence of SUD in the anesthesia profession
-Understand the risk factors, signs of SUD, and prevention strategies
-Obtain information on available resources for victims of SUD in the anesthesia community

2.) *Survey – Analyze the learners' knowledge before and after the workshop*

-Collect demographic information:
    -Age
    -Gender
    -Years of experience as a professional
-Knowledge of SUD before the module:
    -What is the prevalence of SUD in anesthesia professionals?
    -What are risk factors associated with increased incidence of SUD in anesthesia personnel? (Pick 3)
    -What are signs of SUD in anesthesia providers? (Pick 3)
    -What is NOT a way to prevent SUD in anesthesia personnel?
    -What resource is available to assist victims of SUD?
-Knowledge of SUD after module completion:
    -Same questions as above

3.) *Key Concepts*

-SUD incidence, risk factors, signs of abuse, prevention strategies, and resources

4.) *Topics and Subtopics of modules*

-Incidence
    - Both general population and anesthesia providers, most abused substances, trends
-Risk factors
    - Profession: Availability, lacking checks/balances, desired effects visualized daily
    - Individual: Timing after initial licensure, gender, personality traits
-Signs of abuse
    - picking up extra shifts/call hours, behavior change, unreliability
-Prevention strategies
    - Awareness and education, drug screens, risk factor screening, policy/procedure improvements
-Resources

Appendix H

Kotter's 8-Step Model of Change

Juneja, P. (n.d.). Kotter's 8 step Model of Change. Management Study Guide. Retrieved from https://www.managementstudyguide.com/contingency-model-of-change-management.htm

Appendix I

MARIAN UNIVERSITY
Indianapolis ®

Institutional Review Board

DATE:	4-26-2022
TO:	Kursten Smith & Dr. Lee Ranalli
FROM:	Institutional Review Board
RE:	S22.131
TITLE:	Education of SRNAs on Substance Use Disorder Prevalence, Risk, and Prevention
SUBMISSION TYPE:	New Project
ACTION:	Determination of EXEMPT Status
DECISION DATE:	4-26-2022

The Institutional Review Board at Marian University has reviewed your protocol and has determined the procedures proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol and you are cleared to proceed with your project. The protocol will remain on file with the Marian University IRB as a matter of record. Please be mindful of the importance of reporting only de-identified, HIPPA-compliant information about the patient in any exhibit or publication.

Although researchers for exempt studies are not required to complete online CITI training for research involving human subjects, the IRB **recommends** that they do so, particularly as a learning exercise in the case of student researchers. Information on CITI training can be found on the IRB's website: http://www.marian.edu/academics/institutional-review-board.

It is the responsibility of the PI (and, if applicable, the faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified of if problems related to human research participants arise in connection with this project. Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project. Please contact me if you are unsure whether your proposed modification requires review. Proposed modifications should be addressed in writing to the IRB. **Please reference the above IRB protocol number in any communication to the IRB regarding this project.**

Amanda C. Egan, Ph.D.

Appendix J

Table 1

Demographics and Characteristics of All Survey Respondents

Characteristics	n	%
Gender		
Male	9	40.9
Female	13	59.1
Age		
22-29	10	45.5
30-39	9	40.9
40-49	3	13.6
Experience as a Registered Nurse (years)		
<5	11	50
6-10	8	36.4
11-15	2	9.1
16-20	1	4.5

**Note, n= 22*

Table 2

Results of the Survey

Question	Correct Answer	Pre-Test No. (%) Correct	Post-test No. (%) Correct
What is the prevalence of SUD in healthcare professionals?	15%	59.1	86.4
What is the prevalence of SUD in anesthesia professionals?	Up to 20%	18.2	77.3
What are the most commonly abused anesthetic agents among anesthesia professionals? (pick 2)	Opioids, Propofol	36.4	90.9
What are risk factors associated with increased incidence of SUD in anesthesia personnel? (pick 3)	Frequent visualized efficacy of anesthetics, History of trauma, Family history of substance abuse	13.6	36.4
What are signs of SUD in anesthesia providers? (pick 3)	Behavior changes, Personal appearance decline, Difficulty with concentration and memory	59.1	86.4
Which of the following is NOT an evidence-based intervention to prevent SUD in anesthesia personnel?	For-cause drug testing	27.3	45.5
What resources are available to assist victims of SUD?	All of the above	100	95.5

Table 3 Statistical Analysis: Paired Samples Test

Paired Samples Test

		Paired Differences							Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	One-Sided p	Two-Sided p
Pair 1	Pretest Score - Post-test Score	-1.864	1.670	.356	-2.604	-1.123	-5.233	21	<.001	<.001