NORTH CAROLINA NURSES WITH SUBSTANCE USE DISORDER: A
BIOPSYCHOSOCIAL EXPLORATION

by

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Substance abuse has impacted society economically through increased healthcare costs and lost work productivity; however, the greatest impact is the loss of life. Healthcare professionals such as nurses, physicians, pharmacists, and dentists are at risk to the detrimental impact of substance use disorder (SUD) on their professional and personal lives. Approximately 10-15% of the nursing workforce have a SUD, which is consistent with the rate the general population. There are programs offered by state boards of nursing to assist nurses in returning to nursing practice in a safe, monitored, and structured process in order to meet the regulatory mandate of public protection.

The purpose of this study was to examine the characteristics of nurses who enrolled in the North Carolina Board of Nursing's Alternative Program (AP) for SUD and the explore the differences between the characteristics of nurses who complete the AP and those who do not complete the AP. Relationships among biopsychosocial domains were examined utilizing the Biopsychosocial Theoretical Framework. A retrospective descriptive correlational study was conducted of a sample of 285 nurses who were enrolled in the NCBON's AP from January 1, 2011 to December 31, 2014. Nurses were reported to the NCBON due to concerns related to impairment while on duty, discrepancies identified in an agency-controlled substance audit, and

pharmacy reports such as waste and high user reports. The NCBON's AP monitors nurses for a period of 3-5 years. The data collection for this data set concluded in 2018 after each nurse in the cohort either completed the AP or did not complete the AP.

The participants in this study were primarily female and were licensed as a registered nurse. The mean age for the study sample was 39 and the participants were licensed as a nurse for about 10 years at the time of enrollment in the AP. Opioids were the primary substance abused.

The exploration of the relationships among the biopsychosocial variables identified returning to nursing practice (work) as a key characteristic of a nurse completing the NCBON's AP. Other characteristics that were correlated with completion of the AP were prior treatment for SUD, phentermine use, and obtaining legitimately prescribed controlled substances. A logistic regression analysis was performed that identified a unique statistically significant contribution of phentermine use and return to work. A concurrent mental health diagnosis and chronic pain were not statistically significant in relation to completing the AP.

These findings support that there are various factors that influence the development and diagnosis of a SUD. While these characteristics are important to identify, it is also important to recognize that recovery is a life-long and difficult process. This study provides a foundation of evidence related to the characteristics of nurses who participated in the NCBON's AP during a specific timeframe and an exploration of the biopsychosocial factors that lead to completion of the NCBON's AP.

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Doctor of Philosophy in Nursing

by

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DEDICATION

There are several individuals that I would like to dedicate this dissertation. To my mother, Zinat Zara Arnesen also known as Bebe, the love for your family, your kind heart and soul, your strong and unwavering work ethic, your sheer determination, and your love to care for others, is the main reason I was able to complete this dissertation. Leaving your home country of Iran for a better life for your children was I am sure one of the hardest and heart wrenching obstacles you have ever faced. Leaving your profession as a labor and delivery nurse in Iran to make sure you achieved your dream of living in America, again another selfless act, for your family. I am eternally grateful for everything you have given up providing your children an opportunity for a different life. You are the strongest woman I know and I hope you recognize you are a special gem. To my father, Jimmy A. Arnesen, your primary goal was to raise three strong women. You have succeeded, you have three of the strong-minded, tell it like it is, goal-directed daughters. Thank you for pushing me to attend a university and explore life outside of your small hometown.

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along the journey but you never know what's planned for you, you have to keep fighting for what you want and where you want to be. I love you all more than you know and I can't wait to see where life takes each of you. From the words of Amanda Gorman from "The Hills We Climb": "For there is always light, if only we're brave enough to see it. If only we're brave enough to be it." Be your own light and find our own path in life and it will be a great life!

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Introduction

According to the Substance Abuse and Mental Health Services Administration (SAMHSA; 2020b), a substance use disorder (SUD) is defined as a "recurrent use of alcohol and/or drugs causing significant impairment including health problems, disabilities, and failure to meet major responsibilities at work, home or school." The National Institute on Drug Abuse (NIDA) describes addiction as a chronic, complex, and treatable disease that requires treatment approaches specific to each person (NIDA, 2020). According to Crowley and Morgan (2014, p. 29), a SUD is further defined as "a maladaptive pattern of substance use leading to clinically significant impairment or distress" and is diagnosed according to the Diagnostic and Statistical Manual of Mental Health Disorders (DSM).

In 2019, the National Survey on Drug Use and Health reported approximately 14.1% of the U.S. population age 18 to 25 and 6.7% of the population age 26 and older reported symptoms consistent with a SUD the previous year according to the DSM-IV (SAMHSA, 2020a). According to the Center for Behavioral Health Statistics and Quality (CBHSQ, 2020), the DSM-IV's criteria were used for the 2019 National Survey on Drug Use and Health study. Three or more of the following criteria were required to diagnose the presence of a SUD or drug dependence: spending time engaging in activities related to use, using a drug for longer than intended use, development of a tolerance to the drug, failed attempts to cut down on use, continued use despite physical and emotional effects of the use, changes in normal activities due to drug use, and withdrawal symptoms when attempting to decrease drug use (CBHSQ, 2020).

It is not uncommon for individuals with a SUD to have a co-existing mental health disorder. According to SAMHSA (2020a), there was an increase in the occurrence of a co-

occurring SUD and mental illness from 7.2% to 7.6% in 18-25-year-old individuals and 5.0% to 5.2% in 26-29-year-old individuals. In this same report, of the participants who identified both a SUD and mental health illness, only 12.7% received treatment for both, 33.4% received no treatment, and 66.6% reported receiving treatment for one condition (SAMHSA, 2020a). Co-occurring mental health illnesses are often undetected and undertreated (Green et al., 2007; Mueser et al., 1998) which is compounded by providers who do not have education and training to treat both a SUD and co-occurring mental health illness (Blumenthal et al., 2001; Carey et al., 2000). This disparity in treatment and management of SUD and co-occurring mental health illnesses has led to poor SUD treatment outcomes and higher costs of healthcare (Hunter et al., 2005). The Mental Health Parity and Addiction Equity Act of 2008 requires "some level of coverage" for mental health services (CMS, 2014); however, employers of nurses often terminate employment when issues related to SUD are identified potentially leaving the nurse without any healthcare insurance coverage. The nurse who is terminated from employment has the financial burden of treatment costs. The loss of employment by nurses was described as equal to the pain felt during bereavement (Persolja et al., 2020). These additional stressors compounded with the stigma associated with SUD in the nursing profession (Darbo & Malliarakis, 2012; Dittman, 2008) could trigger relapse. In a study of 158 nurses in a drug monitoring program, a co-occurring mental health illness increased the odds of relapse 3.83 times and multiple life stressors increased the odds of relapse over five times (Tipton, 2005).

Despite the Surgeon General (2016) urging immediate action to address the national opioid epidemic, and the increasing incidence of drug-related overdose deaths (United States Department of Health and Human Services [U.S. DHHS], 2016), there has been limited nursing regulatory research regarding state boards of nursing non-disciplinary alternative programs. In

2018, in a *Spotlight on Opioids* released by the Surgeon General, reinforced the need to address the opioid crisis with a focus on prevention, treatment, and recovery services (U.S. DHHS, 2018).

In 1984, the American Nurses Association (ANA) identified that nurses were experiencing problems with addiction; however, there was not a process or program in place for nurses to seek treatment when their practice was impaired due to use of mind-altering substances (Naegle, 2003). In collaboration with the ANA, the National Council of State Boards of Nursing (NCSBN) developed a structured non-disciplinary program for nurses whose practice had been impacted by a SUD to meet the mandate of public (patient) protection (NCSBN, 2011).

In North Carolina (NC), there are over 165,000 licensed nurses practicing in various healthcare settings across the state (NC Board of Nursing [NCBON], 2021). Approximately 143,000 of the licensed nurses are registered nurses (RNs) and over 22,000 are licensed practical nurses (LPNs; NCBON, 2021). There are over 14,100 registered nurses that are approved as Advanced Practice Registered Nurses (APRNs), which includes certified nurse practitioners, certified registered nurse anesthetists, certified nurse-midwives, and clinical nurse specialists (NCBON, 2021). In the United States, approximately 10-15% of nurses have a diagnosis of a SUD (Bell et al., 1999; Bozimowski et al., 2014; Dunn, 2005; Monroe et al., 2013; Shaw et al., 2004) and these percentages have the potential to increase due to disruption in treatment services, loss of income, increased stress, and increased isolation related to the COVID-19 pandemic (Lopez-Pelayo et al., 2020). While the exact number of NC nurses with a SUD is unknown, national percentages would suggest between 16,000 and 24,000 licensed nurses in NC have some degree of a SUD. This is a significant public health concern that requires the attention of boards of nursing, employers of nurses, and addiction treatment professionals.

A nurse with an untreated SUD presents multifaceted issues that raise concerns for patient safety, health of nurses, and the professional nursing image (Kunyk, 2015). The NCBON enrolled 289 licensed nurses in its non-disciplinary Alternative Program (AP) from 2011 to 2014. This is far below the estimated 16,000 licensed nurses with some degree of a SUD; however low number of participants in the program could be due to SUDs not impacting the licensed nurses' practice, or from lack of reporting of a SUD by employers or colleagues. The low enrollment in the AP could also be due to limited knowledge of SUD programs offered by the NCBON.

Research focused on nurses in non-disciplinary drug monitoring programs (DMP) is needed to protect patients from potentially harmful, unintended nursing care errors and to offer targeted and individualized support for nurses with a SUD. This study examined the characteristics of nurses enrolled in the NCBON's AP. In addition, this study explored the differences between the characteristics of nurses who completed and those who did not complete the AP and examined the relationships between the biopsychosocial variables that impact AP completion.

Background and Significance

Nurses have access to controlled substances such as opioids in their professional roles (Cares et al., 2015; Dittman, 2008). Diversion of controlled substances by nurses and other healthcare professionals cost public and private healthcare insurance carriers an estimated $72.5 billion dollars per year (Lindsay, 2016). According to the 2020 Protenus Diversion Digest (PDD), physicians (41.7%) and nurses (34.7%) were identified as the primary diverters of controlled substances. About 148 million doses of opioids were diverted in 2019 with an estimated $183 million revenue loss reported by healthcare organizations. The most common diverted controlled substances were oxycodone, hydrocodone, and fentanyl (PDD, 2020).

The U.S. Bureau of Labor Statistics (U.S. BLS) reported nurses have an overall 11.9%

higher risk of occupational injuries than other occupations and over 27% of these reported

injuries are related to back injuries (U.S. BLS, 2018). Nurses who suffered a musculoskeletal

injury and were prescribed an opioid for pain relief reported the injury contributed to the

development of a SUD (Foli, et al., 2020). Occupational injuries have been linked to over-

prescribing of controlled substances (Franklin et al., 2019) and long-term opioids prescribing

triples the amount of time before an individual can return to work (Savych et al., 2019).

Nurses are reported to be affected by SUD at a similar incidence as the general

population (Kunyk, 2015; NCBSN, 2011); however, a nurse with an untreated SUD is in a direct

position to negatively impact the health, safety, and welfare of patients. According to Schaefer

and Perz (2014), healthcare workers have potentially exposed approximately 30,000 patients to

infectious diseases by tampering with patient controlled analgesic pumps and vials of controlled

substances. The use of contaminated needles to access controlled substances has caused patient

harm and increased healthcare costs (Schaefer & Perz, 2014). There is potential for patient injury

or death (Foli et al., 2020; Kunyk, 2015), increase in healthcare costs (Bowen et al., 2012), and

death or serious injury (Bowen et al., 2012; Monroe & Kenaga, 2011) when a licensed nurse has

an undiagnosed or untreated SUD and continues to practice nursing.

Drug overdoses are the leading cause of accidental deaths (Dowell et al., 2017) and have

contributed to the decrease in life expectancy in the U.S. (Schiller & Mechanic, 2019).

According to the North Carolina Department of Health and Human Services (NC DHHS; n.d.-b),

approximately 1,825 North Carolinians died of an unintentional overdose in 2018. The average

of unintentional deaths in North Carolina from 1999 to 2018 was 737 deaths per year (NC

DHHS, n.d.-b). According to the NC Opioid Action Plan Data Dashboard (n.d.), over 1,700 NC

residents died in 2018 from an overdose, almost 6,800 residents were treated in an emergency department for an overdose, and over 3,300 naloxone reversals were administered outside of a hospital emergency department setting. The overdose death rate in NC (24.1 per 100,000) was found to be statistically higher than the national average of 21.7 per 100,000 (Hedegaard et al., 2018). Due to uninhibited access to oral and injectable controlled substances, nurses with a SUD are at risk for unintentional overdoses and even death (Cares et al., 2015; Maher-Brisen, 2007; Mumba & Kraemer, 2019). The specific number of nurses who have died as a result of an overdose was not identified in the literature due to studies combining multiple healthcare groups (Hawkins et al. 2019; Shaw et al., 2020). However, Ke et al. (2018) identified nurses in Taiwan had a four-fold increased risk of overdose by sedatives, hypnotics, and antipsychotics than other healthcare providers. In addition, a nurse's age impacted the incidence of overdoses; nurses less than 35 years had a higher risk of overdose than nurses older than 50 years (Ke et al., 2018).

Current nursing research is needed to identify best regulatory practices to support the needs of nurses with a SUD who are participating in a DMP while protecting the public. Public protection includes informing and collaborating with nursing leaders about the availability of non-disciplinary SUD treatment programs and creating a dialogue with treatment providers to develop program-specific guidelines that meet the needs of this specific population of nurses.

Philosophical Approach to SUD and the Impact on Nursing

The approach to treatment of SUDs has often been informed by prevailing philosophical beliefs about substance use at a specific time in history. Philosophical beliefs prior to the 1980s were that an individual with an addiction had a moral defect, and that their behaviors were a personal choice or individual issue with no external influencing factors (Heise, 2003; Kunyk et al., 2016). A transition in the approach to SUD in nurses occurred in the 1980s, from disciplinary

action, loss of licensure, and immediate criminal charges to understanding SUD (Heise, 2003). The widely accepted belief among nursing is that SUD is a behavior caused by a disease process with external contributing factors such as biological, psychological, and sociological influences (Kunyk et al., 2016).

The first professional nursing organization to acknowledge the issue of addiction and provide guidelines to support impaired nurses in their recovery and return to nursing practice was the American Nurses Association (ANA; Heise, 2003). The ANA in collaboration with the NCSBN identified a need for early detection and support for SUD treatment for nurses (Heise, 2003; NCSBN, 2011). The NCSBN developed evidence-based recommendations to assist state boards of nursing in the implementation of alternative-to-discipline programs (ATD; NCSBN, 2011). An ATD program is a non-disciplinary approach to promote public safety by quickly removing a nurse from practice to engage in the SUD treatment process (NCSBN, 2011). The ATD program will monitor the nurse through drug screening, adherence to treatment requirements established by the nurse's provider, and upon return to nursing practice the nurse will be monitored for practice concerns and relapse (NCSBN, 2011). According to Darbro (2011), ATD programs focus on quickly removing a nurse from practice, providing information for entering treatment and initiating monitoring requirements without a lengthy disciplinary process. The intent of the guidelines was to "implement better practices in helping the healers to heal themselves and at the same time helping protect the public" (NCSBN, 2011, p. 2). In 2015, the ANA released the most current version of the Code of Ethics establishing that a nurse's duty is to act on impaired practice to protect the profession, the patient, and the public, and to ensure nurses receive treatment and assistance (ANA, 2015). However, despite a nurse's ethical duty to report an impaired colleague, Bettinardi-Angres and Bologeorges (2011) found almost 20% of

nurses were hesitant to report a colleague for diversion or impairment. A lack of knowledge and experience related to addiction in nurses were cited as the primary reasons for their reluctance (Bettinardi-Angres & Bologeorges, 2011). In a joint position statement issued by the Emergency Nurses Association (ENA) and the International Nurses Society on Addictions (IntNSA), both identified a need for education about drug and alcohol abuse, establishment of policies, and support of alternative to discipline approaches for SUD (ENA & IntNSA, 2017). The American Psychiatric Association (APA) urged the development of continuing education resources for early identification of SUDs among healthcare professionals and establishment of prevention programs (APA, 2012).

Currently in the U.S., there are 39 states that offer an ATD approach for nurses who are experiencing a SUD (Bettinardi-Angres et al., 2012). The remaining states only offer disciplinary DMPs, in which the nurse with a SUD is reported to the National Practitioner Databank (NPDB), a repository of adverse licensure actions for healthcare providers, leading to longstanding difficulties in returning to the nursing workforce (Bettinardi-Angres et al., 2012). Disciplinary approaches have negative consequences for the nurse and the nursing profession through the removal of nurses from practice instead of offering treatment (Monroe et al., 2008). Disciplinary approaches to SUD are not effective in addressing SUD and create financial barriers for nurses which could limit treatment options (Haack & Yocum, 2002; Kunyk, 2015; Monroe et al., 2008). The focus should be on identifying nurses and getting the nurse into treatment (Davidson et al., 2020b). The loss of income and insurance, length of due process in disciplinary proceedings, and potential criminal charges (Crowley & Morgan, 2014; Davis et al., 2014; Kunyk, 2015) can contribute to difficulties in affording treatment for SUD.

Nurses and Substance Use Disorder

In the U.S., there are over 5.9 million actively licensed nurses providing nursing services in a variety of healthcare settings (NCSBN, 2021b). According to the North Carolina Board of Nursing's (NCBON) licensure statistics, there are over 165,000 actively licensed nurses that include registered nurses and licensed practical nurses (NCBON, 2021). The primary employment settings for RNs are hospital, ambulatory care, and home health (NCBON, 2021). The primary employment setting for LPNs are long-term care, home health and ambulatory care (NCBON, 2021).

According to the available literature, approximately 10-15% of nurses in the U.S. have a SUD diagnosis (Bell et al., 1999; Bozimowski et al., 2014; Dunn, 2005; Monroe et al., 2013; Shaw et al., 2004). The percentage of licensed nurses with a SUD is consistent with the percentage within the general population (Monroe et al., 2013). A search of the literature did not uncover a reanalysis of the percentages of nurses with a SUD since the evolution of the opioid epidemic that may result in even higher percentages of nurses with a SUD.

There are several factors that contribute to the development of SUD in nurses that include workplace access and knowledge of controlled substances, a sense of immunity to addiction (Kenna & Lewis, 2008), demanding professional duties and long work hours (Schluter et al., 2012; Trinkoff et al., 2000). Nurses can be conflicted about seeking assistance or treatment for SUD due to a stigmatized culture of healthcare professionals towards individuals with SUD (Horton-Deutsch et al., 2011; Matthias-Anderson & Yurkovich, 2016), fear of loss of nursing licensure and income (Brown et al., 2003; Cares et al., 2015; Dittman, 2012). In a study of 17,489 disciplinary sanctions reported to the NPDB for physicians ($n = 1,604$), pharmacists ($n = 41$), and nurses ($n = 15,573$), a nurse was twice as likely to have their nursing licensed revoked

or placed on probation than a physician (Eisenmann, 2020). Kunyk (2015) identified that a punitive regulatory approach to addressing nurses with SUD was not effective, and non-punitive options should be available for nurses to access resources more quickly for treatment while being monitoring upon return to nursing practice.

There is clearly a need to identify nurses with a SUD to provide them with treatment options that include drug monitoring, addiction support by treatment providers, and self-help meetings like Alcoholics Anonymous (AA) or Narcotics Anonymous (NA). In a study of 302 nurses participating in a DMP, 48% reported using substance(s) while at work, and 40% felt the substance(s) used negatively affected their nursing practice (Cares et al., 2015). The fact that nearly half of nurses with a SUD in the Cares et al. (2015) study reported using substances while at work and were aware of their substance-induced impairment while on the job is alarming and highlights the need for swift action to protect nurses, patients, and the public. In addition, these results suggest that colleagues may have difficulty identifying behaviors consistent with SUD or are conflicted about reporting nurses with a SUD to a state board of nursing or employer.

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Alternative-to-Discipline Programs

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According to the NCSBN (2011), ATD programs were established to offer nurses a non-punitive option for treatment when a nurse's practice is impaired or impacted the use of mind-altering substances. According to Russell (2020), there are 39 ATD programs that are operated by either state boards of nursing (SBON) or outsourced to a peer assistance program. A state must have statutory authority to implement an ATD program and must go through rulemaking processes to establish an ATD program (Dunn, 2005; NCSBN, 2011). In order to support non-disciplinary and non-punitive approaches to how nurses with SUD are treated, a change in the

nursing profession from a stigmatized culture of SUD to an empathetic and evidence-based

treatment approach is necessary (Worley, 2017).

An ATD program option is a more expedient approach to placing a nurse impaired by a

SUD into a treatment program than a disciplinary approach that requires a formal investigation

into the nurses' actions (Monroe & Kenaga, 2011; NCSBN, 2011; Privette et al., 2015). The

enforcement of ATD programs can prevent delayed entry into treatment, reduce safety risks to

the public, and return the nurse to practice safely (Brown et al., 2003; Fogger & McGuinness,

2009; Kunyk, 2015) as opposed to a punitive approach to addressing SUD. Each state's ATD

programs vary in structure and requirements, but all meet statutory requirements of public

protection (NCSBN, 2011). Variations include program length, requirements for substance use

treatment, stipulations, or restrictions upon re-entering the workforce, and drug testing

requirements (Matthias-Anderson & Yurkovich, 2016; Monroe et al., 2013; NCSBN, 2011). The

differences in structure of ATD programs offered by each SBON make it difficult to compare

factors and outcomes across programs related to program completion and termination (Matthias-

Anderson & Yurkovich, 2016; Monroe et al., 2013). In addition to monitoring nurses with a

diagnosis of SUD, some state ATD programs also monitor nurses who need structured support

due to a primary mental health diagnosis (Mumba et al., 2019a).

Voluntary Review of the NCBON Alternative Program

In 2009 and 2010, the NCBON requested the Citizen Advocacy Center (CAC) to conduct

an external voluntary evaluation of the AP, an ATD program, structure and operational

processes. According to Privette et al. (2015), the goal of the evaluation was to promote

transparency to the public and develop regulatory foundations for APs. The CAC is an

organization of community lawyers with a goal of keeping the public informed, promoting

transparencies in processes, advocating for the public, and promoting accountability of public agencies (CAC, 2019). The model guidelines for the ATD programs developed by the NCSBN recommend external audits (Darbro, 2011). A review was conducted to evaluate the overall AP structure and program operations to determine if the NCBON was meeting the mandate of public protection (Privette et al., 2015). The findings of the CAC review were categorized into five areas: administrative, information technology, nurse employer relationship building, drug testing quality, and management of noncompliance (Privette et al., 2015). The CAC review informed the development of the complete data set that was used in this study.

NCBON Alternative Program

The NCBON AP is the central focus of this research. The NCBON offers a non-disciplinary AP for NC licensed nurses with a SUD. The NC Nursing Practice Act (NPA) gives the NCBON the authority to offer a program "for aiding in the recovery of nurses who experience chemical addiction or abuse" and to monitor safe practice (NPA, 2019, para. 5). The mission of the AP "is to protect the public by providing a structured approach to monitoring and returning the recovering chemically dependent nurse to safe nursing practice" (NCBON, 2020, para. 1). The NCBON AP is not a treatment program per se. The NCBON monitors nurses for compliance with treatment, drug screening, and nursing practice upon return to the workforce. The NCBON does not dictate the type of treatment a nurse must obtain. This decision is made by treatment providers. The four objectives of the NCBON's AP are public safety through monitoring of nurses, intervention to decrease time between nurses' acknowledgement of substance use disorder and starting the treatment and recovery process, returning nurses to practice, and providing a non-punitive, non-public approach to recovery of nurses with SUD (NCBON, 2020).

A nurse is not eligible for the AP if there is clear and convincing evidence of sale, distribution, patient harm, prior drug related felony, prior monitoring by a state board of nursing for drug related concern, withholding, diluting, or substituting a controlled substance that is intended for a patient. These acts are interpreted by the NCBON as potentially high-risk for patient harm. If a nurse was denied the opportunity to participate in the AP due to withholding, diluting, or substituting a controlled substance, the nurse may have the opportunity to enter the Chemical Dependency Discipline Program (CDDP). The CDDP offers the same program structure as AP; however, this program results in disciplinary action on the nurse's license. The facts and evidence gathered during an investigation could also support a suspension of the nurse's license instead of an offer of CDDP. This study focused on the NCBON non-disciplinary AP and nurses who entered from 2011 to 2014. This research did not include nurses in the CDDP or nurses who were not eligible for AP.

To be considered for the AP, a nurse must acknowledge a SUD, agree to enter treatment for SUD, follow all recommendations for treatment by providers, submit to an evaluation by an addictionologist, and follow any additional recommendations by their treatment providers. The American Society of Addiction Medicine (ASAM) utilizes six dimensions to create treatment plans for patients. These dimensions are "(1) acute intoxication and/or withdrawal potential, (2) biomedical conditions and complications, (3) emotional, behavioral, or cognitive conditions and complications, (4) readiness to change, (5) relapse, continued use, or continued problem potential, and (6) recovery/living environment" (ASAM, 2020). The Addictionologist Evaluation Form used by the NCBON AP (in Appendix C) details the specific areas the addictionologist must address for the nurse's evaluation.

Participants in the NCBON AP are responsible for the cost of each observed drug screen which is currently $78 per screen, and the cost can increase if the nurses' drug of choice is not on the standard drug screening panel. Nurses are advised by NCBON staff to budget for 2-3 screens per month. The number of drug screens can be increased if the nurse is non-compliant with calling into the drug screening automated system daily. The nurse does not know ahead of time when they will be selected for a drug screen. The nurse must drug screen that same day, if selected. In addition to the costs of the random drug screens, the participant is also responsible for costs associated with treatment, addictionologist evaluation(s), specialty evaluations recommended by the addictionologist, and any other costs determined to be relevant to program participation (Privette et al., 2015).

During the time frame of 2011 to mid-2013 providers were using the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) to diagnose SUD; therefore, most of the nurses in this dataset were diagnosed using the criteria of the DSM-IV. The DSM-IV assessed substance use disorders by "abuse" and "dependence" (SAMHSA, 2016). The change from the DSM-IV to the DSM-V regarding SUD was the combination of substance abuse and substance dependence, removal of legal criterion, and inclusion of severity score (mild, moderate, or severe; SAMHSA, 2016).

Nurses enrolled in the NCBON AP agreed to follow requirements such as randomly administered observed drug screens (urine, hair, or nails), completion of inpatient or outpatient treatment based on treatment provider recommendations, attending at least three AA or NA meetings per week, and restrictions on nursing practice for at least three to five years. The AP provides a staggered return to various aspects of nursing practice over the course of the program.

The first year provides greater structure and limitations. The first year of program participation restrict the nurse's practice from the following:

1. Shall not work 11:00 p.m. - 7:00 a.m. and shall not work more than eighty (80) hours per two (2) weeks or more than forty-eight (48) hours in a seven (7) day interval unless approved by the [AP Compliance] Coordinator.

2. Shall not work more than twelve (12) hours in a twenty-four (24) hour period.

3. Shall not have access to, or be accountable for, controlled substances.

4. Advanced Practice Registered Nurses with prescriptive authority shall not prescribe controlled substances.

5. Shall not work in critical care specialty areas including, but not limited to, the:

   a. Emergency Department

   b. Intensive Care Unit (ICU)

   c. Cardiac Catheterization Lab

   d. Labor and Delivery

   e. Operating Room (OR) and Post-Operative Anesthesia Care Unit (PACU)

6. Shall not work in a substance abuse treatment facility.

7. Shall not float from unit to unit within a facility.

8. Shall work under the direction of an on-site Registered Nurse or, with approval from the Coordinator, under the direction of an on-site work monitor who is a licensed health care provider.

The following restrictions are in place for a minimum of two years:

1. Shall not work as a Certified Registered Nurse Anesthetist.

2. Shall not work for a staffing agency or as a traveler.

3. Shall not work in home health or in-home care.

4. Shall not work in home hospice.

5. Shall not make home visits.

Conditions may be extended in accordance with an addictionologist's recommendation(s) or incidents of noncompliance (NCBON, 2020).

      According to NCBON policy (2012), the license of a nurse in the AP is flagged with a number to contact a NCBON compliance coordinator for licensure information during the entirety of a nurse's participation in the AP. This alert is visible to any member of the public who searches the online NCBON nursing licensure data base using a nurses' name, license number, or social security number. The nurse in the AP is required to disclose to current and potential employers the reason for AP participation and primary drug of choice. In addition, the nurse must provide a job description for review by the NCBON compliance staff and participate in a worksite conference call prior to starting or resuming any nursing employment. If a member of the public calls the NCBON regarding the flag on the license, the license is verified as being "active with conditions." Information about the nurses' participation in the AP is not disclosed to non-employer callers.

      When nurses sign agreements to enter the NCBON AP, data are collected to monitor the nurse's progression and compliance with program mandates throughout the program until the nurse either completes or does not complete the AP (termination). Termination from the program can occur due to an unreported relapse, a positive drug screen, failure to attend treatment meetings, failure to disclose urgent care (UC) or emergency department (ED) visits, failure to report and file prescription identification forms, and ongoing non-compliance according to the NCBON Progressive Action Policy (PAP). The PAP was implemented on February 1, 2012

based on the recommendations from the CAC. This policy provides the NCBON staff with guidelines on how to manage non-compliance with AP requirements in a fair and consistent manner. A copy of the PAP is provided to each nurse who enters the AP and is reviewed with the nurse by the compliance coordinator. The nurse is notified of what will result in termination from AP. Nurses in the AP are required to report UC or ED visits for Board staff to monitor for patterns of obtaining controlled substances. In addition, if a nurse is administered a controlled substance or receives a controlled substance prescription while a patient in an UC or ED, this documentation will provide evidence of legitimate administration of a controlled substance. If a nurse is frequently seen in an ED and obtaining controlled substances, this may require an evaluation by a treatment provider or addictionologist, as this may be a sign of relapse.

The timeframe for enrollment in the AP for the cohort described in this study was from January 1, 2011 to December 31, 2014. The AP requires nurses to be monitored for at least 3-5 years (NCBON, 2020). Data collection concluded in 2018 after each nurse in this cohort either completed the AP or did not complete the AP. Completion of the AP occurs when a nurse successfully completes all program requirements. Upon AP completion, the flag is removed from the license verification online system and the nurse will have an unencumbered license. Termination or not completing the AP may occur if a nurse is non-compliant with program requirements or if the nurse elects to voluntarily withdraw from the program. When a nurse is terminated from the AP, their nursing license is suspended, and they are prohibited from practicing as a nurse for a minimum of one year. The consequences of failure to meet program requirements is detailed in the consent order, a legally binding agreement, that the nurse signs at the beginning of the AP. In order to request reinstatement of the license, the nurse is required to complete a sobriety notebook which details information about the nurse, employment since

suspension of license, treatment history, aftercare participation, addictionologist evaluation with evidence of compliance, relapse prevention plan, results of drug screens, criminal background check, healthcare providers acknowledgement of a nurse's diagnosis of SUD, licensure information from other states, and completion of continuing education requirements prior to appearing before the Licensure Review Panel (LRP) of the NCBON. The LRP is a panel of board members who make the determination if a nurse can return to practice and if so, under what, if any, practice restrictions.

If a nurse voluntarily withdraws or does not complete all AP requirements, the nurse could be eligible for the CDDP. Participation in the AP is a one-time opportunity. The CDDP has the same requirements as AP; however, the CDDP imposes disciplinary action on the nurses' license. When a nurse enters the CDDP, a public consent order (PCO) is posted to the NCBON website with findings of fact and conclusions of law. When a PCO is posted to the NCBON, any member of the public may search the NCBON licensure database for a nurse's name, license number, or social security number to review the PCO and the details of the facts associated with the action. Additionally, the disciplinary action is entered into NURSYS®, a national databank for licensure verification and is reported to the NPDB as required by federal laws.

The AP structure supports the regulatory mandate of public protection; however, the NCBON has not conducted previous research regarding outcomes of participation in the AP. Additionally, while data collected about the NCBON AP participants in this study included variables related to SUD, these variables have not yet been examined in the context of biopsychosocial domains.

Theoretical Framework

The purpose of this study was to examine the characteristics of nurses enrolled in the NCBON's AP between 2011-2014, explore the differences between the characteristics of nurses who completed and those who did not complete the AP and examine the relationships between the biopsychosocial (BPS) variables in nurses with SUD. Although evidence suggests non-disciplinary, non-punitive drug monitoring programs are an effective option in resolving complaints against nurses and getting nurses into treatment more quickly (Darbro, 2011; Haack & Yocum, 2002; Kunyk, 2015), there is limited research about a nurse's progression through non-disciplinary drug monitoring programs in terms of the BPS variables associated with SUD treatment and recovery. Therefore, the BPS model was selected as the theoretical framework for this study.

In 1977, Dr. George L. Engel, an American internist and psychiatrist challenged the medical profession's adoption of the biomedical model as overly reductionistic and focused on disease as a result of solely biological or molecular abnormalities. Engel developed a BPS conceptual framework that refuted that health and illness are explained by a single cause (Engel, 1977; Epstein, 2014). Engel (1977) concluded "adherence to a model of disease is no longer adequate" (p.129) and proposed the BPS model as a holistic approach to health and illness (Engel, 1977).

The BPS model draws from concepts of general systems theory introduced by Ludwig von Bertalanffy in 1968 that aimed to unify systems of science (Engel, 1979; von Bertalanffy, 1972). von Bertalanffy (1972) wrote "the biological, behavioral and social sciences require equal consideration" (p. 423). The BPS model is composed of the following three concepts: biological, psychological, and sociological (Engel, 1977). The biological concept of the BPS model is

defined as genetic predispositions and biological factors associated with illness that cannot be changed by an individual. The psychological concept of the BPS model is defined as thoughts, emotions, behaviors, and the mental state of a person. The sociological concept of the BPS model is defined as the social, cultural, environmental, and economic surroundings of a person (Engel, 1977).

According to Engel (1977), complex interactions between biological, psychological, and sociological domains determine the cause, manifestations, and outcomes of health and disease. The BPS model provides a holistic perspective of illness without losing the patient and patient experiences within the diagnosis (Borrell-Carrio et al., 2004) and is useful in understanding complex factors associated with SUD.

Figure 1 represents the BPS model as it is proposed to influence SUD in nurses. There are three main components of this model: biological, psychological, and sociological. The definition of each of these three domains, and variables that are measured within each of the domains are in the Definitions and Terms section of this chapter. A diagnosis of a SUD is placed in the center of the model because each of the three domains influence SUD since a SUD is an ongoing, lifelong diagnosis that is impacted by various aspects of a nurses' life and events over time. There is a cyclic pattern to this model which represents influential factors at different points in the lives of nurses with SUD. In the context of this study, the BPS model describes the health and recovery of a nurse that leads to completing or not completing the AP.

The variables in the data set were organized into each domain of the BPS model (biological, psychological, and sociological; in Appendix D). In addition, the operational definition for each variable and how each variable is measured is defined in Appendix D.

Figure 1.

Biopsychosocial Model of Substance Use Disorder
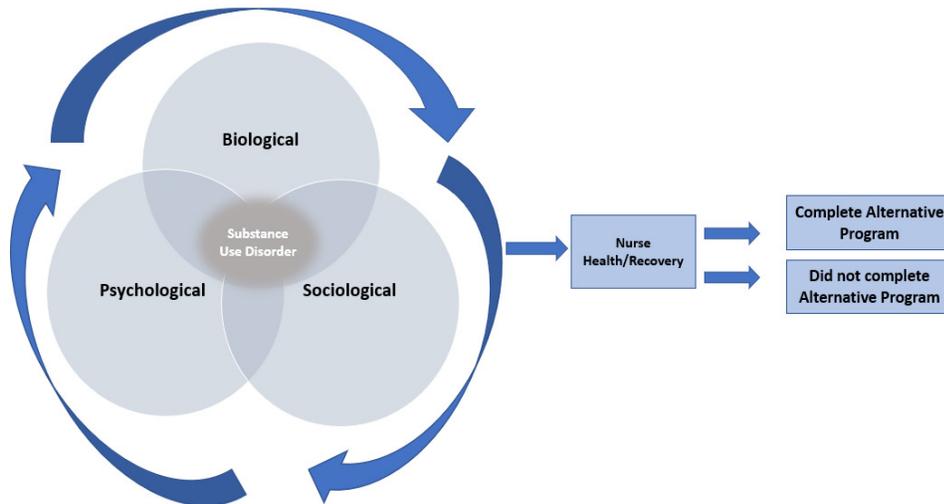
Assumptions of the BPS Framework

The underlying assumptions of the BPS framework are:

1. Biological, psychological, and sociological domains are intercorrelated in understanding health and illness and are not isolated (Engel, 1977; Engel, 1980);

2. Biological, psychological, and sociological domains impact health and illness (Engel, 1977; Engel, 1980);

3. Biological, psychological, and sociological domains are impacted by disruptions in any one area (Engel, 1980);

4. The BPS model is holistic (Borrell-Carrio et al., 2004);

5. The BPS model focuses on resilience (Epstein, 2014);

6. The BPS is a systems approach (Engel, 1980); and

7. The BPS model is patient centered (Engel, 1980; Epstein, 2014).

Definition of Terms

Alternative Program for Substance Use Disorder. The NCSBN (2011) defines an alternative program for substance use disorder as a "voluntary, non-public and non-disciplinary program, which offers an alternative to traditional discipline authorized in statute and rule by nursing or other regulatory board" (p. 235). Other terms used interchangeably to reference APs are alternative-to-discipline (ATD) programs or non-disciplinary drug monitoring programs.

Biological. Biological is genetic predispositions and biological factors associated with illness that are unmodifiable (Engel, 1977). In the context of this study, the biological variables are identified as, but not limited to, age, gender, race, ethnicity, family history of substance use disorder, chronic medical conditions requiring controlled substance prescriptions, and other medical diagnoses.

Co-occurring diagnosis. The American Addiction Centers (2019) defines a co-existing or co-occurring diagnosis as both a SUD and a mental health diagnosis such as depression, anxiety, or attention deficit hyperactivity disorder. In addition, a co-occurring diagnosis may include other medical diagnoses such as chronic pain. According to the National Alliance on Mental Illness, dual diagnosis is another termed used to refer to an individual with both a SUD and mental health diagnosis (2017).

Completion. Completion of the alternative program means satisfying all the requirements with no identified compliance issues, resulting in an unencumbered license.

Controlled substance. A controlled substance is "a drug, substance or immediate precursors included in Scheduled I, II, III, IV, or V" of the Title 21 United States Code

Controlled Substance Act (U.S. Department of Justice Drug Enforcement Agency [U.S. DOJ-DEA], 2016, para. 6).

Diversion. Diversion is "any unaccountable loss, theft, use for unintended purposes, or tampering of a drug. [A] drug diversion is a medical and legal concept involving the transfer of any legally prescribed drug from the individual for whom it was prescribed to another person for any illicit use, including any deviation that removes a prescription drug from its intended path from the manufacturer to the intended patient" (Brummond et al., 2017, p. 90).

Drug of choice (DOC). The substance (alcohol, illicit, or controlled) an individual prefers to use based on how the substance make the person feel.

Impaired nursing practice. Impaired nursing practice is "the inability of a nurse to perform the essential functions of his or her practice with reasonable skill or safety because of chemical dependency on drugs or alcohol or mental illness" (Dunn, 2005, p. 574).

Inpatient treatment. Inpatient or residential treatment is admittance to a facility treatment for a specified amount of time based on treatment recommendations by the provider. The NCBON does not determine if a licensed nurse needs to attend inpatient treatment. This decision is made by the nurse's treatment team.

Licensed nurses. A licensed nurse includes registered nurses, licensed practical nurses, and advanced practice registered nurses (certified nurse-midwives, certified registered nurse anesthetists, clinical nurse specialists, and nurse practitioners) who participated in the AP.

Outpatient treatment. Outpatient treatment or intensive outpatient treatment is treatment received for a specified number of hours per week and length of time based on provider recommendations. The NCBON does not determine the level of treatment required to treat the nurse's SUD. The determination of level of treatment is made by the nurse's treatment team.

Psychological. In the context of this study, psychological variables are identified as, but are not limited to, thoughts, emotions, behaviors, and the mental state of a nurse as measured by mental health diagnosis, specific SUD diagnosis, prior SUD treatment, type of treatment (inpatient or outpatient), months of drug use, history of mental, sexual, or physical abuse, sleep problems, work stress, AP completion or termination, relapse, and reason for termination.

Recovery. Recovery is "the experience (a process and a sustained status) through which individuals, families, communities impacted by severe alcohol and other drug (AOD) problems utilize internal and external resources to voluntarily resolve these problems, heal the wounds inflicted by AOD-related problems, actively manage their continued vulnerability to such problems, and develop a healthy, productive, and meaningful life" (White, 2007, p. 236).

Sociological. Sociological is defined as the physical environment, culture, relationships with others, economics, work, family, and stress that surrounds the nurse. In the context of this study, sociological variables are identified as, but not limited to, the region of the nurses' residence, license type, highest education, years in nursing, shift working, employment status, how substances obtained, how SUD is detected, the substance in question, the drug of choice and method of use, any criminal charges, the number of days until return to work, work setting, and reason for request to withdraw from AP.

Substance Use Disorder (SUD). The NCSBN (2011) defines a SUD as a "state of dependency on mind altering chemicals with continuing use that persists despite negative consequences" (p. 239).

Termination. Termination is not meeting the contractual requirements for participation in the AP or voluntary withdrawal from the AP. At the point of termination, a nurse will not be able

to practice as a licensed nurse for at least 1-year and until a sobriety notebook is completed, and the nurse presents before the NCBON LRP.

Purpose

The purpose of this study was to examine the characteristics of nurses enrolled in the NCBON's AP. In addition, this study explored the differences between the characteristics of nurses who complete and those who do not complete the AP and to examine the relationships among the BPS domains. The population for this study were nurses who enrolled in the NCBON's AP from January 1, 2011 to December 31, 2014. Data collection for this cohort was completed in 2018. There were no studies identified that explored the BPS domains that contribute to the development of SUD in licensed nurses in NC. This research will expand the body of knowledge about SUD in nurses from a biopsychosocial perspective and provide the foundation for an evidence-based approach in determining programmatic changes needed to ensure patient and public safety, and retain qualified, licensed nurses with a SUD in nursing practice.

Research Questions

The study answered the following research questions:

1. What is the demographic composition of licensed nurses participating in the North Carolina Board of Nursing's (NCBON) Alternative Program (AP) for substance use disorder (SUD) from January 2011 to December 2014?

2. What is the relationship among biopsychosocial domains (biological, psychological, and social) in licensed nurses diagnosed with a substance use disorder (SUD) who participated in NCBON's AP from January 2011 to December 2014?

3. Is there a difference among biopsychosocial domains (biological, psychological, and social) in licensed nurses in the AP who completed the program compared to those who did not complete the program?

4. Is there a relationship between a co-occurring mental health diagnosis or chronic pain and a licensed nurse's completion of AP?

Description of Manuscripts

This dissertation is presented in the two-manuscript option. Chapters four and five will be submitted for publication in peer-reviewed journals. The literature in chapter two will serve as a guide for the literature review sections for each manuscript. Each manuscript will be written in the format required by the journal selected.

The manuscript presented in chapter four (manuscript one) will examine the composition of licensed nurses participating in the NCBON's AP for SUD from January 1, 2011 to December 31, 2014. Manuscript one will address research question 1. This manuscript will be submitted to the *Journal of Nursing Management,* a peer-reviewed journal focused on nursing management, policy development, quality, safety, and practice.

Chapter five is manuscript two and explored the differences in the characteristics of nurses who completed and did not complete the AP and will examine the relationships among the BPS domains. Manuscript two will address research questions 2, 3, and 4. This manuscript will be submitted to the *Journal of Nursing Regulation,* a peer-reviewed journal focused on regulation of the nursing profession.

Summary

Although the available evidence suggests non-disciplinary, non-punitive drug monitoring programs are an effective option in resolving complaints against nurses and getting nurses into

treatment more quickly (Darbro, 2011; Haack & Yocum, 2002; Kunyk, 2015), there is limited

research about how nurses progress through non-disciplinary drug monitoring program or what

BPS variables are associated with SUD and recovery. In a search of the literature, no studies

were identified that examined the BPS domains of nurses with a diagnosis of a SUD who

participated in an ATD program like the NCBON AP. Understanding the interaction among the

BPS domains in nurses with a SUD, as well as, similarities and differences in nurses who

complete or do not complete the AP could lead to potential changes in program structure,

changes in monitoring and identification of nurses with SUD by employers, the development of

treatment guidelines, and interventions specifically tailored for nursing professionals. This

research study was not only about nurses with SUD, but it is also about preventing SUD in

nursing, understanding how to best approach nurses with SUD from a regulatory and humanistic

standpoint, and understanding that the nursing profession, as a whole, should know that it is

acceptable to ask for help, to be vulnerable, and to make self-care a priority.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

The purpose of this study was to examine the characteristics of nurses enrolled in the North Carolina Board of Nursing's Alternative Program (NCBON AP). In addition, this study will explore the differences between the characteristics of nurses who complete the AP and those who do not complete AP and examine the relationships among the biopsychosocial (BPS) domains. The population for this study was licensed nurses who enrolled in the NCBON's AP from January 1, 2011 to December 31, 2014.

Consistent with the aims of this study, the review of literature is as follows: (a) literature that investigates neurobiology of substance use disorder (SUD); (b) literature that explores the impact of SUD; (c) literature that explores the incidence of SUD in healthcare professionals; (d) literature that examines the theoretical framework; (e) literature that explores the biopsychosocial factors associated with substance use disorder in nursing; (f) literature that examines the federal and state legislative response to SUD in nurses; and (g) literature that explores nursing regulation and SUD.

Neurobiology of Substance Use Disorder

The neurobiology of SUD is defined as the study of the brain and nervous system when addictive mind-altering substances are used (Koob & Volkow, 2016; Substance Abuse Mental Health Services Administration [SAMHSA], 2016). The brain's reward system is responsible for the sensation of pleasure and is impacted when mind-altering substances cause a decrease in the effectiveness of dopamine in the reward center (NCSBN, 2011; NIDA, 2018; Wright et al., 2012). The three main areas of the brain that are involved in the development of a SUD are the basal ganglia, extended amygdala, and prefrontal cortex (SAMHSA, 2016). The basal ganglia

controls the reward center of the brain, the pleasurable effects of substance use, and the ongoing use of substances (SAMHSA, 2016). The extended amygdala is linked to the feelings of stress and anxiety that are experienced with withdrawal (SAMHSA, 2016). The prefrontal cortex is known as the "executive function" of the brain and is responsible for making decisions such as continued use of substances (SAMHSA, 2016). As an individual uses the substance(s) of choice, enjoys the feelings from the substance(s), and attempts to obtain the same sensations from the first use, they begin to exhibit behaviors that lead to craving the substance(s) at incrementally higher amounts (NCSBN, 2011; Wright et al., 2012). As an individual develops a tolerance for the substance of choice, they require escalating frequencies and amounts to get the same effect(s) or feeling(s) as the first time the substance was used (NIDA, 2018; SAMHSA, 2016). The "vicious circle of addiction" as described by Bettinardi-Angres and Angres (2010) involves a bio-genetic predisposition, initial use (reward), continued use (tolerance), escalation of use (chasing the feeling), maintenance use (withdrawal symptoms with impaired decision-making), and desperation use ("running on empty;" p. 34). Volkow et al. (2016) described three cyclic stages of addiction: "binge and intoxication," "withdrawal and negative effect," and "preoccupation and anticipation" (p. 365). Volkow et al. (2016) found the development of addiction depends on varying genetic, environmental, and developmental factors such as family history of addiction, exposure to drug use during adolescence, poor family support, socially stressful environments, easy access to drugs, environment of socially acceptable drug use, and mental illness.

According to Miela et al. (2018), the neurobiological changes resulting from abuse of mind-altering substances are alteration of the reward system, overactivation of the brain stress system with compromised destressing, decreased impulse control, and inhibited response. The

mesolimbic pathway or the reward pathway of the brain plays a significant role in the development of a SUD by increasing the levels of dopamine (Massaly et al., 2016). This increase in dopamine results in drug seeking behaviors, less interest in life without drugs, and intense focus on use of the substance(s) of choice (Leyton & Vezine, 2014). As the cycle of substance use progresses, some individuals reach "a turning point" that leads to a change in behaviors and a desire to seek treatment (Darbro, 2005; Dittman, 2012; Ervin, 2015; Lillibridge et al., 2002; Pettersen et al., 2018). However, a long-lasting effect of the use of substance is the potential for relapse (Hyman & Malenka, 2001). Additionally, there are possible long-term effects of SUD include problems with learning, judgment, and decision-making, as well as stress, memory impairment, and behavioral changes (NIDA, 2018), all of which pose risks to the impaired nurse, the nursing profession, and the patients who are recipients of nursing services.

Impact of Substance Use Disorder

In 2016, the Surgeon General identified SUD as a nationwide epidemic with significant impact on citizens, families, and the U.S. economy (U.S. Department of Health and Human Services [DHHS], 2016). From 2015 to 2018 the opioid epidemic cost the U.S. economy $631 billion in healthcare expenditures, premature mortality, criminal justice expenses, lost work productivity, and funding of government programs (Davenport et al., 2019). In 2015, heroin use disorder cost the U.S. $51.2 billion in treatment for heroin addiction, loss work productivity, treatment of chronic diseases such as HIV and hepatitis C, and activity within the criminal justice system (Jiang et al., 2017).

Drug overdoses are the leading cause of accidental deaths (Dowell et al., 2017) and have contributed to the decrease in life expectancy in the U.S. (Schiller & Mechanic, 2019). From 1999 to 2017, there were almost 16,000 deaths attributed to heroin overdoses, over 47,000 deaths

associated with opioid (morphine, codeine, hydrocodone, and oxycodone) overdoses, and almost 33,000 deaths associated with synthetic opioids (fentanyl, fentanyl analogs, and tramadol) overdoses (Hedegaard et al., 2018). According to Healthy People 2020, addiction to mind- and behavior-altering substances lead to cardiac diagnoses, pregnancy complications, sexually transmitted diseases, domestic violence, child abuse, and motor vehicle crashes (Office of Disease Prevention and Health Promotion, 2020).

Suicide is another devastating consequence of SUD. In a longitudinal study, Davidson et al. (2020a) examined the incidence of suicide and social and mental health risks among 1,824 nurses and 152,495 non-nurses. Nurses, both male ($n = 355$) and female ($n = 1,469$) participants in this study were found to commit suicide at rates greater than the general population (Davidson et al., 2020a). Substances such as opioids or benzodiazepines were used by 27% ($n = 399$) of female nurses to commit suicide, and another 17% ($n = 254$) of female nurses used over the counter medications such as acetaminophen or diphenhydramine (Davidson et al., 2020a). Male nurses ($n = 355$) were more likely to commit suicide by use of firearms (41.7%) and 33.2% of men committed suicide by hanging, strangulation, suffocation, and poisoning. Female nurses had higher incidences of job dissatisfaction and mental health diagnoses (Davidson et al., 2020a). These findings suggest the following initiatives are needed to combat suicide rates in the nursing profession: (1) increase SUD education, (2) earlier identification of SUD with referrals to treatment programs, and (3) strategies to identify and reduce stressors in the nursing workplace (Davidson et al., 2020a).

The chronic, progressive nature of SUD poses a substantial health risk to individuals and is potentially fatal (Griffith, 1999). According to the North Carolina Department of Health and Human Services (NC DHHS, n.d.-b), approximately 1,825 North Carolinians died of

unintentional overdoses in 2018 with an average of 737 deaths per year from 1999 to 2018.

These staggering statistics have led to changes in laws to protect the citizens of NC and to

provide guidelines to healthcare professionals who prescribe controlled substances. However,

both the citizens of NC and healthcare professionals are still suffering the consequences of SUD.

Incidence of Substance Use Disorder in Healthcare Professionals

The consequences of SUD in health professionals are far-reaching. In a study of 404

healthcare professionals whose deaths were attributed to drug use, approximately 63% were

nurses, 37% were medical providers, and almost half had a mental health diagnosis (Pilgrim et

al., 2017). In a cross-sectional study of members of the American College of Surgeons ($n =$

7,197), over 15% of participants met the diagnostic criteria for alcohol use disorder (AUD;

Oreskovich et al., 2012). Surgeons diagnosed with an AUD were two times more likely to be

female, and reported emotional depletion, depression, and decreased career satisfaction as

reasons for alcohol consumption (Oreskovich et al., 2012). Rojas et al. (2013) found in a study of

physicians ($n = 17$), pharmacists ($n = 42$), and nurses ($n = 37$), 46% of the sample had a family

history of SUD, and almost double the males ($n = 22$) compared to females ($n = 12$) had legal

consequences related to SUD. In a study of dentists, the primary substance of choice was alcohol

(Kenna & Lewis, 2008; Kenna & Wood, 2005). In a survey conducted in patients diagnosed with

an AUD that did not receive treatment ($n = 810$), the primary reason provided was "lack of

problem awareness" (Probst et al., 2015).

Physicians experience SUD at the same rate as nurses; however, anesthesiologists are

almost three times more likely to develop a SUD with intravenous fentanyl being the drug of

choice (Booth et al., 2002; Skipper et al., 2009). According to NC opioid use data, deaths from

synthetic opioids such as fentanyl have soared from over 100 deaths in 2013 to almost 1300 in

2017 (NIDA, 2019). Other high-risk physician groups include emergency department physicians, psychiatrists, and general practitioners (Bryson & Silverstein, 2008; McLellan et al., 2008). In a study of physicians with a SUD ($n = 862$) who participated from 1995 to 2001 in sixteen physician health programs across the U.S., the primary substance of choice was alcohol followed by opioids. In this study, 86% of participants were male and the average age was 43 (Skipper et al., 2009).

There are many compounding factors associated with decision-making to seek treatment for substance abuse. A literature review conducted by Vayr et al. (2019) identified six primary barriers to physicians asking for help or seeking treatment for SUD. These were denial, stigma, co-occurring psychiatric disorders, potential impact to family, profession, finances, or societal, limited education regarding substance abuse, and fear by relative and colleagues regarding the ramifications of reporting.

Pharmacists have access to and are knowledgeable about controlled substances which can perpetuate addiction among these professionals (Kenna & Lewis, 2008). In a study of pharmacists in a drug monitoring program (DMP) in a southeastern U.S. state, the drug of choice identified by the participants were opioids followed by sedatives. In this study 72% ($n = 32$) of participants were male, and the average age was 43 (Merlo et al., 2014).

Healthcare professionals who relapse while practicing pose a significant risk to the health and safety of patients. According to a study of physicians participating in the Washington State Physicians Health Program ($n = 292$), 25% of participants had at least one relapse, with 58% of relapses occurring within the first two years of monitoring (Domino et al., 2005). Additionally, a positive family history of SUD, a co-occurring mental health diagnosis, and the use of intravenous opioids as the drug of choice increased the odds of relapse two-fold (Domino et al.,

2005). In a study of 158 licensed registered nurses (RN) and licensed practical nurses (LPN) who participated in the Texas Peer Assistance Program for Nurses (TPAPN), participants that attended primarily inpatient treatment were four times as likely to relapse as participants who attended primarily outpatient treatment (Tipton, 2005). Tipton (2005) reported that nurses who did not attend self-help group meetings were over eighteen times more likely to relapse than nurses who attended self-help group meetings. Psychiatric co-morbidities, termination of employment, lack of a volunteer advocate, and life stressors were identified as predictors for relapse (Tipton, 2005). In a study of 1,553 TPAPN participants (LPNs and RNs) Mumba et al. (2019b) found that nurses who identified alcohol as the primary substance of choice were 70% more likely to relapse and 67% more likely to relapse if they had a co-occurring mental health diagnosis. Most nurses in this study (67%) relapsed within the first 6 months of program participation (Mumba et al., 2019b).

The studies of physicians and pharmacists cited in this section revealed that most participants were male. However, in a female dominated profession such as nursing, females are the predominant participants in DMPs. Gender and SUD in nursing will be discussed later in this chapter. Patients, families, and healthcare organizations trust healthcare professionals to make clinically sound decisions regarding patient care. However, healthcare professionals who practice with an untreated SUD can pose significant risks to patients, increase litigation risk for themselves and the healthcare organization, and increase healthcare costs.

Theoretical Framework

The Biopsychosocial (BPS) Model was the theoretical framework used to guide this study. In 1977, George Engel, an internist and psychiatrist, developed the BPS model due to his belief that the biomedical model was based on a reductionistic approach to the biology of

disease. The BPS theory evolved deductively from two other theories, the biomedical model and general systems theory (Engel, 1977). Engel (1977) described general systems theory as "the philosophic view that complex phenomena are ultimately derived from a single primary principle, and mind-body dualism, the doctrine that separates the mental from somatic" (p. 130). Additionally, Engel utilized inductive methods in the development of this model by observing clinical practice, developing hypotheses about clinical practices scenarios, and drawing general conclusions based on observed clinical scenarios. These scenarios included both patients who presented with illness but were not diagnosed with a disease and patients who presented with illness and disease was diagnosed (Engel, 1977). This difference in patient presentation led to the development of the BPS model to help explain the variations in health and illness experienced by patients (Engel, 1977). Engel (1977) argued that health and illness could be explained more thoroughly through the lens of biological, psychological, and sociological domains as opposed to a strictly biomedical model. The biomedical model according to Engel (1977) focused solely on pathophysiological factors associated with health and illness. The main assumption of the BPS model is that each domain within the model influences the development of health and illness (Engel, 1977).

In SUD, biological, psychological, and sociological domains contribute to an individual's use of substances (Skewes & Gonzalez, 2013). These domains are important to understand within the context of licensed nurses who are providing care to patients in a potentially impaired state. The BPS model has been broadly used as a theoretical framework in the addiction literature (Griffiths, 2005; Pagé et al., 2016; Wiss, 2019), to understand correlation of anxiety and SUD (Buckner et al., 2013), and was utilized to assess health status and disability across various settings by the World Health Organization International Classification of Functioning, Disability

and Health (WHO, 2002). Additionally, studies of chronic pain and psychiatric disorders (Álvarez et al., 2012) have utilized the BPS as a framework. The BPS model has been used to study addiction among various patient populations including Islamic and Chinese cultures (Ghaferi et al., 2016; Zhang et al., 2017), sex addictions (Samenow, 2010), gambling addiction (Clark & Goudriaan, 2018), and addiction impacting infant-mother bonding/interactions (Cataldo et al., 2019). Each of these studies provided important evidence for understanding the BPS model in the context of addiction in diverse clinical settings and patient populations. The BPS model provides a useful framework for examining the complexities of SUD in a population of licensed nurses participating in the NCBON AP.

Biopsychosocial Variables Associated with Substance Use Disorder in Nursing

The biopsychosocial variables associated with substance use disorder in nursing are explored in the following sections.

Biological Variables

Age and Gender

The age range of nurses who participated in a DMP was from 38 to 42 years with approximately 10 years' experience as a nurse (Cares et al., 2012; Clark & Farnsworth, 2006; Fogger & McGuinness, 2009; Mumba et al., 2019a). In a study of nurses in the New Jersey Recovery and Monitoring Program, over 60% were older than 41 years of age, and 83% had at least four years of nursing practice (Bowen et al., 2012).

According to the 2017 NCSBN National Workforce Survey, male nurses consist of approximately 7% to 9% of the U.S. nursing workforce. However, males account for up to 25% of participants in nursing DMPs (Clark & Farnsworth, 2006; Haack & Yocum, 2002; McNelis et al., 2012; Mumba et al., 2019a). In a study of 1,338 nurses in the Indiana State Nurses Assistance

Program (ISNAP), almost 13% were male; however, the researchers identified that the elimination of missing data may have contributed to the overrepresentation of males in this study (McNelis et al., 2012). Likewise, in a longitudinal study comparing four state boards of nursing disciplinary and non-disciplinary programs, 15.3% of 111 nurses in the sample were male (Haack & Yocum, 2002). Cares et al. (2015) analyzed the data of 302 participants in a peer assistance program and reported that 19.2% of the participants were male. In an examination of gender, type of license held, and length of time in a drug monitoring program, Mumba et al. (2019a) did not find that gender was related to type of license held or the length of time in a monitoring program; however, men were more likely than women to be employed while participating in the program. The overrepresentation of males in DMPs documented in the literature requires further investigation.

Genetic Predisposition

According to the National Institutes of Health (2020), a genetic predisposition or genetic susceptibility is defined as an individual's likelihood of developing a disease based on the genetics inherited by their parents. The heritability of addiction is reported as moderate to high (Agrawal & Lynskey, 2008; Bevilacqua & Goldman, 2009). The heritability of various addictions based on the substance of abuse was reported to range from 40% to 79% with alcohol, opiates, and cocaine identified as the top three substances (Bevilacqua & Goldman, 2009). Genetics are not the sole contributor to the development of a SUD (Vink, 2016). There are environmental factors such as socioeconomic status, life events, and education status that also contribute equally to development of an addiction (Morrow & Flagel, 2016; Vink, 2016).

In a study of 5,889 adult twins, the genetic susceptibility for alcohol use disorder (AUD) was equal among males and females with 64% of the sample having noted heritability of AUD

(Heath et al., 1997). However, in a study of 1,212 participants and their siblings (n = 2,755) who met the DSM-III criteria for alcohol dependence, males were twice as likely to be alcohol dependent compared to the females (Bierut et al., 1998). In a study of 299 individuals with SUD (probands) with a diagnosis of opioid (n = 87), cocaine (n = 27), cannabis (n = 35) or alcohol dependence (n = 89), their first-degree relatives (parents and siblings; n = 1,267), and a control group of 61 probands, the researchers found the relatives of the probands had an 8-fold risk of a SUD (Merikangas et al., 1998). Clark and Farnsworth (2006) identified 183 (88%) of 207 nurses participating in Idaho's Program for Recovering Nurses (PRN) reported a personal history of SUD and 84 (40%) reported a family history of SUD.

Chronic Pain and SUD

Chronic pain (CP) is described as a persistent condition lasting at least 3 months that extends beyond the expected healing process time. The cause of the pain may not be identifiable (National Institute of Neurological Disorders, 2019; Treede et al. 2019). The prevalence of CP is about 20% in the U.S. population (Dahlhamer et al., 2018) and the presence of opioid use disorder with a co-occurring diagnosis of CP ranges from 38% (for moderate to severe chronic pain) to 68% (for any chronic pain; Tsui et al., 2016). A diagnosis of CP can negatively impact an individual's SUD treatment (Tsui et al, 2016).

In the late 1990s the assessment and management of pain was identified as a national priority (U.S. DHHS, 2019). During this time, pain became known as "The 5th Vital Sign" and was aggressively treated with opioids (U.S. DHHS, 2019, p. 11). The drive to manage pain with narcotics played a part in the opioid epidemic, subsequently leading to the federal government's 5-Point Strategy to Combat the Opioid Crisis (U.S. DHHS, 2019). The financial impact to the U.S. related to pain management has been estimated to be an upwards of $635 billion dollars per

year. Unfortunately, there has also been an increase in overdose deaths related to the use of heroin, synthetic opioids, and prescriptions opioids (U.S. DHHS, 2019).

In a retrospective chart review from 2013 to 2018 of 951,533 adults in a large healthcare system in North Carolina, opioid dependence was correlated with the diagnosis of CP. The authors noted that females in this study reported an increased prevalence of CP and concurrent mental health diagnoses (John & Wu, 2020).

The treatment of CP is complicated by the opioid epidemic and regulations to further protect patients and providers who prescribe controlled substances (St. Marie, 2016). The treatment of both CP and SUD can be complicated and pose significant challenges (Przekop et al., 2018). Patients with CP and SUD reported manipulative and deceptive behaviors to obtain opioids but also reported that providers were unclear about how to treat concurrent CP and SUD (St. Marie, 2014). Patients with SUD who are seeking treatment for CP can go undetected due to inadequate assessments and knowledge of treatment modalities (Przekop et al., 2018). In a study comparing patients with CP ($n = 274$) and without CP ($n = 379$) who were seeking treatment for opioid dependence, most participants were White (91.2%) and the average age for the CP group was 35.4 years (Weiss et al., 2014). The CP group reported pain duration ranging from 1 year (92.7%) to at least 4 years (54.7%). Although both groups reported pain relief as the primary reason for use of opiates, 13.1% of the CP group reported using opiates to get high and 56.5% reported continued use of opiates to avoid withdrawal symptoms.

Management of CP with non-prescription treatment options can be challenging. In a qualitative study of advanced practice registered nurses ($n = 20$) who treated patients with CP and SUD, the providers reported difficulties with insurance carriers approving non-prescription

modalities for pain management of CP, presenting yet another barrier to individuals with CP

receiving effective management of their pain.

Although the nursing profession is predominantly White, little is known about Black

nurses with SUD. In the U.S. general population there was a 21% increase in overdoses from

2015 to 2016; however, specifically in Black Americans, there was a 40% increase noted during

this same timeframe (SAMHSA, 2020c). A January 2021 report from the NC Department of

Health and Human Services (NCDHHS) indicates that the largest group that presented to

emergency departments for opioid overdoses were White (almost 60%) followed by Black

individuals (about 15%) (NCDHHS, 2021). This suggests that while Black Americans are more

likely to die of an overdose (SAMHSA, 2020c) they may not seek treatment or have limited

resources or access to emergency services. Reasons for Black Americans not seeking treatment

for opioid disorder requires further study.

Psychological Variables

Co-occurring Mental Health Diagnoses

According to the National Alliance on Mental Illness, a co-occurring mental health

disorder or a dual diagnosis in an individual with SUD is defined as experiencing "a mental

illness and substance use disorder at the same time" (NAMI, 2017). Both mental illness

(psychiatric disorders) and SUD have a hallmark symptom of denial, and as a result, individuals

often have limited insight into their exhibited behaviors (Malliarakis et al., 2012).

Health care professionals with a SUD commonly experience co-occurring mental health

diagnoses. In a study of 84 healthcare professionals, Rojas et al. (2013) found that 69% ($n =$58)

of individuals were diagnosed with a co-occurring mental health illness (major depressive

disorder [MDD], anxiety, personality disorder, ADD/ADHD); however, only 57% ($n = 48$)

received a non-controlled antidepressant, benzodiazepine, mood stabilizer, stimulant, or a combination to treat the co-occurring mental health illness. Comín et al. (2014) found that the most frequent co-occurring diagnosis for nurses and physicians with a SUD was MDD. Co-occurring mental health diagnoses are identified in about 50% of individuals with a SUD, are often left untreated, and are under-recognized which impacts treatment for SUD (Kelly, & Daley, 2013; NIDA, 2018; Ross & Peselow, 2012).

The lack of specialized provider training about SUD with co-occurring diagnoses may pose barriers for individuals who need treatment for both SUD and other mental health diagnoses (Blumenthal et al., 2001). Outpatient treatment services are limited in specific services offered to individuals with SUD as compared to inpatient or psychiatric services that may have established services specific for a dual diagnosis (Timko et al., 2005). According to Chilton et al. (2019), an effective approach to treating an individual with a dual diagnosis is an integrated group process. This approach results in development of therapeutic relationships, reduction of environmental and situational stressors, reduction in stigma, and reduction in feeling excluded (Chilton et al., 2019).

Relapse

A relapse is a return to the use of substances such as alcohol, opiates, or illicit drugs after an attempt to stop use, and is an anticipated part of the recovery process (NIDA, 2018). The recovery process consists of cycles of relapse and remission (Kunyk et al., 2016). Nurses, upon returning to clinical practice and after treatment for SUD are faced with triggers for relapse such as ease of access to opiates (Clark & Farnsworth, 2006), feelings of isolation (Angres et al., 2010), stress (Angres et al., 2010), and decreased confidence in decision-making (Brown et al., 2003). The first relapse after SUD treatment contributes to subsequent relapses (Domino et al.,

2005). Of nurses who return to nursing practice, 60% will relapse within the first 6 months

(Mumba et al., 2019b; Shaw et al., 2004). However, nurses who have a strong social network and

social support system in place have an increased chance of maintaining recovery, avoiding

relapses, and returning to safe nursing practice (Bowen et al., 2012).

Relapse is common in individuals with a SUD, particularly if a co-occurring mental

health diagnosis is present. In a study of nurses participating in the TPAPN, 23% (n = 1553) had

a dual diagnosis, both a SUD and a mental health diagnosis, which contributed to an increased

incidence of relapse while in the program (Mumba et al., 2019b). In a study of physicians,

similar findings related to relapse and dual diagnosis were found, as well as a family history of

SUD that also contributed to relapse in this study (Domino et al., 2005).

The stress of stigma associated with a SUD diagnosis along with the risk of loss of

licensure and income source are contributing factors to relapse rates (Mumba et al., 2019b).

After completing treatment, the likelihood of relapse increases and continues to increase with

each subsequent relapse; however, the incidence of relapse among individuals decreases over

time as the length of time in a DMP increases (Domino et al., 2005). Returning to nursing

practice generally occurs early in the SUD recovery journey and is marked by insecurity in

relapse prevention, shame of having a SUD diagnosis, and being secretive about being in

recovery (Matthias-Anderson & Yurkovich, 2016).

Sociological Variables

Drug of Choice

The drug of choice abused by nurses with SUD varies; however, there are commonalities

among substance use documented in the literature. According to data from the Idaho, Indiana,

and Texas state nursing SUD recovery programs, the primary drug of choice was consistently

alcohol, followed closely by opioids (Clark & Farnsworth, 2006; McNelis et al., 2012; Mumba et al., 2019a; Pace et al., 2020). The most common controlled substances diverted from healthcare facilities are opioids (Berge et al., 2012). Opioids have a high potential for abuse and are often diverted for personal use to support an evolving SUD (Berge et al., 2012). In a study of LPNs, RNs, and APRNs (*n* = 207) participating in Idaho's Program for Recovering Nurses from 1985 to 2000, injectable substances (heroin, morphine, and meperidine) were abused by 64% of the sample and 72% (*n* = 149) abused both alcohol and opioids (Clark & Farnsworth, 2006). This study suggests that polysubstance abuse may be common. Cares et al. (2015) reported 25% (*n* = 302) their sample of nurses with a SUD obtained their drug of choice from their place of employment. Of these nurses, 48% reported using alcohol or drugs while at work and 40% reported their clinical practice competencies were negatively impacted while at work (Cares et al., 2015). However, more than 60% of these same nurses reported patients were not at risk under their care (Cares et al., 2015). These findings lend support for what Probst et al. (2015) identified as "lack of problem awareness" (p. 5). Cares et al. (2015) found that nurses reported that they secured the preferred substances by obtaining orders from providers for specific or desired controlled substances not intended for patient use, not wasting controlled substances as required by agency policy and federal laws, removing waste from sharps containers, withholding or diluting a controlled substance medication intended for a patient, and forging prescriptions for controlled substances. Although the literature indicates that alcohol is the most abused substance, diversion, and abuse of controlled substances, such as opioids, can also cause nurse impairment and lead to harmful patient care events.

Stigma

Stigma is defined as "labeling, stereotyping, separation, status loss, and discrimination occurring together in a power situation that allows them" (Link & Phelan, 2001, p. 377). Self-stigma is defined as "persons [interpreting] themselves as both failing in effective agency and not living up to their own normative standards, and their recognition of this leads to a set of negative self-regarding attitudes, central to these being shame" (Matthews et al., 2017, p.275). Feelings of stigma are associated with the past criminalization of substance use (Buchman et al., 2017). Despite SUD being viewed as a public health crisis, individuals with SUD are fearful to seek healthcare or recovery care and are afraid of being labeled as "addicts" or "substance abusers" (Buchman et al., 2017). In addition, healthcare workers are known to deliver care to individuals with SUD in a stigmatizing manner (Buchman et al., 2017).

According to Lillibridge et al. (2002), nurses with SUD perceived that they were viewed as frail with no self-discipline and had the "undesirable characteristics of addicts" (p. 227). Fear of seeking treatment and disclosing private information about substance use history to potential employers were identified as contributing to perceived stigma (Darbro, 2005; Lillibridge et al., 2002). Although feeling stigmatized by their substance use may be perceived by nurses with SUD, this view is not always shared among their peers (Cook, 2013). A study of nurses (n =119) trust of nurses re-entering the workplace after a diagnosis of SUD, identified that most nurses (96%) were willing to work alongside nurses with a SUD, and 80% believed nurses with a SUD would respond appropriately to patient needs. In addition, the majority (81%) of nurses in this study thought nurses with a SUD should be able to return to practice, and 78% agreed that nurses in recovery should not receive punitive actions related to nursing licensure. However, only 35% of nurses surveyed in this study reported being knowledgeable about SUD and the impact of the

disease on nurses and their practice (Cook, 2013). Lastly, nurses reported the requirement to discuss personal stories of their SUD with potential employers and having a public document or alert posted on a nursing board's website was reported as stigmatizing and embarrassing (Cares et al., 2015).

The challenges associated with stigma can be reduced with proper education about SUD (Cook, 2013) and the chronicity of the disease process (Cares et al., 2015). In addition, increasing social support has benefits on the physical and mental health of individuals with a SUD by encouraging coping behaviors learned during treatment (Birtel et al., 2017; Chou et al., 2013). Stigma felt by nurses with a SUD has the potential to impact trust between nursing professionals. This stigma could be reduced by ongoing education for nurses about SUD and programs that support recovery.

Barriers to Seeking Treatment

Nurses with a SUD often experience barriers when seeking treatment. Of 100 participants who sought treatment at a substance abuse treatment facility in Ontario, Canada between March and June 2018, women ($n = 50$) reported barriers to seeking treatment for SUD due to the responsibilities of raising a family, lack of childcare, stigma of being a parent with a SUD, and fear of losing custody of children (Agterberg et al., 2020). Other explanations for women not seeking treatment for SUD are perceived "social taboos," stigma, social pressures, and being sole caretakers for children (Cloud & Granfield, 2008). It should be noted that although women account for most of the nursing workforce, they may be underrepresented in DMPs due to inconsistencies in primary care assessments that fail to identify symptoms of SUD such as depression, insomnia, and anxiety (Darbro & Malliarakis, 2012).

Barriers to seeking assistance or treatment for SUD reported in the literature are: the desire to self-resolve, fear of lack of confidentiality, generalized fear, anxiety about losing the ability to practice nursing, embarrassment about seeking help, lack of knowledge about the availability of state board recovery programs, not perceiving SUD as a health problem, being too sick to seek help, unable to afford treatment, lack of insurance, and lack of a primary health care provider (Cares et al., 2015). The nursing profession is consistently identified as the most trusted profession; with this in mind, many nurses struggling with SUD are faced with shame and guilt in acknowledging a need for help (Mumba, 2018). The fear of being condemned or judged by colleagues may encourage concealment of and silence about substance abuse (Ross et al., 2014). An additional barrier to seeking treatment identified by nurses in DMPs was the financial costs of programs and financial constraints due to limited employment options and lack of healthcare insurance (Brown et al., 2003; Matthias-Anderson & Yurkovich, 2016; Mumba, 2018).

Barriers in Returning to Nursing Practice

Nurses are faced with barriers in returning to nursing practice. Childcare issues, lack of insurance and transportation, lack of time for treatment due to being single mothers, fear, and not knowing resources available for treatment are cited as reasons for not returning to the nursing workforce (Rosen et al., 2006). Matthias-Anderson & Yurkovich (2016) conducted a grounded theory study that included 22 registered nurses that had reentered nursing practice after SUD treatment. Nurses in this study resided in four areas of the U.S., with 81% ($n = 18$) from the Upper Midwest. The authors found that a network of recovery support, self-care, desiring to return to nursing practice, maintaining compliance with monitoring program requirements, being honest about SUD with co-workers, and being able to freely discuss their personal recovery journey assisted in the successful return to the nursing workforce. However, barriers for

returning to the nursing workforce existed, and were identified in this study as stigma, difficulty changing behaviors that led to SUD, inability to change image of self, persistent collegial SUD knowledge deficits, financial difficulties, and lengthy wait times for decisions by nursing boards regarding licensure or program participation. Carter et al. (2019) identified three barriers to work entry. These were personal barriers (shame, stigma, or fear of relapse), professional barriers (punitive licensure actions and employment barriers), and practice barriers (work culture, lack of education and support by colleagues). Additionally, in a study by Cares et al. (2015) nurses were denied employment due to employers being unwilling to work with nurses in a DMP because of the perceived impact of an increased workload on their co-workers. Returning to nursing practice too soon after a diagnosis of SUD can have detrimental impacts on the recovery journey for the nurse (Crowley & Morgan, 2014). According to Crowley and Moran (2014):

> Recognizing when you're far enough along in your recovery journey to return to nursing
> requires cleaning out of the ego, the autopilot, and the control issues, and overriding the
> impulse to run back to the disaster zone. This is a journey of maturity, wisdom, and
> dedication to your long-term best interests (p. 63).

Nursing Practice Setting and Work Environment in SUD

Nurses are employed in a variety of practice settings, work various shifts, and have varying degrees of oversight. In a study by Mumba et al. (2019a), long-term care facilities were identified as the primary practice setting for 12.7% ($n = 198$) of nurses who participated in the Texas Peer Assistance Program for Nurses (TPAPN) and the secondary site was medical-surgical/telemetry for 10.3% ($n = 160$) of nurses. However, results of this study are limited due to lack of data on the practice locations for approximately 42% of the participants in the TPAPN. According to Mumba and Kraemer (2019), home health and long-term care facilities have access

to larger quantities of controlled substances with less stringent audit processes for controlled substances in these settings.

The nursing work environment can influence the development of SUD by providing nurses access to controlled substances. Darbro (2005) concluded that nurses who worked in fast-paced, stressful environments such as emergency departments, intensive care units, and oncology units had higher rates of participation in a DMP. However, Mumba and Kraemer (2019) identified in their sample of 436 participants of the TPAPN long-term care (32%), medical-surgical units (36%), and outpatient services which includes home health and hospice (32%) as areas of practice with the highest participation. In an institutional ethnography study of nurses (*n* = 12) who had experienced substance abuse problems, the findings supported a nurse's work environment contributed to substance abuse and encouraged silence (Ross et al., 2018). Specifically, the study concluded that nurses viewed the use of substances, such as alcohol, as an appropriate way to escape the stress of work, emotional stress, and lack of nursing leadership support (Ross et al., 2018).

Specialty practitioners such as certified registered nurse anesthetists (CRNAs) have been found to have higher rates of SUD due to environmental factors such as uninhibited access to highly addictive anesthetic substances and frequent stressful patient clinical scenarios (Baldisseri, 2007; Bryson & Silverstein, 2008; Valdes; 2014; Wright et al., 2012). According to Hamza and Bryson (2011), CRNAs identified fentanyl via intravenous route as the most common primary substance of abuse. In addition, midazolam, ketamine, nitrous oxide, and propofol via intravenous, subcutaneous, intramuscular, or inhalation routes of administration were abused (Hamza & Bryson, 2011). Each of these substances are found within the typical work setting of the CRNA and pose increased risk for relapse for this population of nurses

(Hamza & Bryson, 2011; Wright et al., 2012). Samuelson and Bryson (2017) identified that the use of anesthetic substances such as propofol and fentanyl intravenously increased the risk of morbidity and mortality among CRNAs.

In a study comparing nurses and physicians with SUD, nurses received less primary care treatment, worked longer shifts, reported a work environment with increased triggers leading to relapses, and received harsher work-related sanctions related to their substance use than their physician counterparts (Shaw et al., 2004). Nurses in recovery identified that their abuse of mind-altering substances would have been identified sooner if their colleagues had received appropriate education about signs and symptoms of SUD in nursing colleagues and taken action to address their concerns (Cares et al., 2015). Darbro (2005) found nurses with a SUD felt stigmatized, labeled, and needed to be secretive about their SUD when colleagues used the terminology "addicts" to describe patients with a diagnosis of SUD. Nurses in recovery reported the top three worked-related behaviors that could have resulted in earlier identification of a SUD by colleagues were "changes in physical or emotional condition," "increased use of pain medications documented," and "repeated absenteeism and/or excessive tardiness" (Cares et al., 201, p. 63).

According to the National Safety Council (2015), the use of opioids for workplace injuries impacts employee safety and employer compensation costs. These injuries lead to chronic pain, disabilities, and changes in employment status of nurses, and cost healthcare organizations an estimated $20 billion per year (Occupational Safety and Health Administration [OHSA], n.d.). Nurses are at risk for musculoskeletal injuries due to activities that involve patient movement such as transferring from bed to chair or lifting patients from floor to bed (OHSA, n.d.), repetitive movements, awkward positions, and prolonged periods of standing

(Soylar & Ozer, 2018). These injuries affect the back and shoulder areas most frequently

(OHSA, n.d.) which could result in long-term pain symptoms and the use of controlled

substances such as opioids for pain management (Han et al., 2017). In a study of 380 emergency

department nurses, nurses sustained musculoskeletal injuries that impacted their knees, upper

and lower back, and shoulders (Bazazan et al., 2019) potentially limiting the nurses' ability to

perform required patient care duties.

Occupational injury among nurses has significant impact on the nursing workforce. An

estimated 12% of nurses leave the profession after a musculoskeletal injury (Gropelli & Corle,

2010). Workload, patient acuity, and organizational changes are all contributing factors to

musculoskeletal injuries that impact not only the injured nurse, but also the quality of care and

patient safety (Lipscomb et al., 2004). Among hospital nurses, musculoskeletal pain was

associated with decreased psychosocial well-being and mental health problems due to somatic

symptoms (Freimann et al., 2016). Chronic pain is an important suicide risk factor that should be

monitored in nurses (Davidson, et al., 2020b). According to Rummans et al. (2018), "pain is a

multidimensional disorder often involving more than just physical pain. Because it encompasses

emotional, social, and spiritual, as well as physical components, it cannot be eliminated by a

single drug" (p. 349).

The literature supports a complex set of variables that lead to development of a SUD.

Nurses with an untreated SUD who are providing care to patients pose potential risks to the

health, safety, and welfare of the public. The specific BPS domains that contribute to the

development of a SUD in nurses has not been sufficiently studied. The findings from this study

can guide nursing regulatory changes in the area of SUD policies, provide evidence to

legislatures regarding the safety and efficacy of APs, and spearhead bedside practice changes to identify and assist a colleague struggling with a SUD effectively and efficiently.

Federal and State Legislative Response to Substance Use Disorder

In 2017, the United States Department of Health and Human Services (U.S. DHHS), identified five overarching priorities related to the opioid epidemic. The priorities identified by the U.S. DHHS (2017) are: (1) improve access to treatment, prevention, and recovery services, (2) increase awareness and availability of reversal medications, (3) increase public health monitoring, (4) increase research on addiction and pain, and (5) advance pain management therapies. These initiatives are important to combat the number of deaths associated with overdoses, protect nurses and the general public, and to increase knowledge of SUD. In response to these national mandates, the state of NC in 2018 enacted into law the NC Strengthen Opioid Misuse Prevention Act (STOP Act) to combat the staggering number of opioid-related deaths impacting the citizens of NC. The STOP Act placed limitations on the prescribing of controlled substances for acute and surgical pain, required consultation for ongoing treatment with opioids, and required review of the NC Controlled Substance Reporting System (CSRS) prior to prescribing a controlled substance (North Carolina Office of the Governor, 2017).

In 2019, the NC Opioid Epidemic Response Act was signed into law to remove barriers that limited healthcare providers from prescribing buprenorphine, a medication-assisted treatment option for opioid use disorder (NC Office of Governor, 2019). In addition, the Opioid Epidemic Response Act strengthened the syringe replacement program and decriminalized fentanyl contaminant testing paraphernalia with a goal of decreasing deaths associated with overdoses in NC (NC Office of Governor, 2019).

Nursing Regulation and Substance Use Disorder

In addition to the aforementioned federal and state mandates to address opioid addiction, it is imperative that nursing regulators provide oversight of the competency and practice of nurses with SUD to protect the health and safety of the public (NCSBN, 2020b; Squires & Dorsen, 2018). The operationalization of APs in the U.S. for nurses with SUD can vary by state, with some programs managed by state boards of nursing, departments of health that oversee multiple healthcare professional programs, and external agencies (Monroe et al., 2008). In NC, AP participants are monitored for compliance of program requirements by NCBON staff (Privette et al., 2015).

Completion of drug monitoring programs is vital to ensuring public protection and supporting nurses in both immediate and long-term recovery efforts. A retrospective cohort study of 7,737 nurses participating in drug monitoring programs from 13 states between 2007 and 2015 was conducted to explore program completion predictors (Smiley & Reneau, 2020). A finding from this study that was nurses who participated in DMPs for at least five years were most likely to complete the program (Smiley & Reneau, 2020). In addition, Smiley and Reneau (2020) concluded bimonthly random drug screens, required daily check-ins, 25 support meetings per year, and 55 to 60 AA or NA meetings per year were associated with program completion.

In 1995 the NCBON implemented a non-disciplinary AP for NC licensed nurses with a SUD. The mission of the NC AP "is to protect the public by providing a structured approach to monitoring and returning the recovering chemically dependent nurse to safe nursing practice" (NCBON, 2020). The authority to offer this program is written in NC law through the NC Nursing Practice Act (NPA). The NPA states the program is "for aiding in the recovery of nurses who experience chemical addiction or abuse" to monitor for safe practice (NPA, 2019).

When a nurse agrees to enter the NC AP, the nursing license is placed in abeyance for at least 3 months to provide time for the nurse to engage in treatment, start building a recovery foundation, and develop strategies for sustained recovery (NCBON, 2020). Nurses enrolled in the AP agree to follow requirements such as randomly selected observed drug screens (urine, hair, or nails), completion of inpatient or outpatient treatment based on treatment provider recommendations, attending at least three AA or NA meetings per week, aftercare for 52 weeks, and nursing practice restrictions after return to practice is approved (NCBON, 2020). In addition, quarterly written performance evaluations by a registered nurse (RN) supervisor and submission of a prescription identification form for all medications prescribed (controlled and non-controlled) is required (NCBON, 2020).

Based on evidence-based research and the NCBON Advisory Committee for DMP recommendations, changes to the structure of AP have been implemented over time to enhance internal procedures and public protection. In 2011, observed drug screens were implemented as a requirement of the AP to be congruent with the U.S. Department of Transportation (DOT) drug screening policy for employees in high risk, safety-sensitive positions (Privette et al., 2015; U.S. DOT, 2018). Participants in the NCBON AP are required to call into an automated system 5 days per week to determine if they are randomly selected for a drug screen. If the nurse is selected to screen, the drug screen must be completed that same day. A certifying scientist will determine the results of the drug screen. A medical review officer (MRO) will complete a final review of the drug screen results. The MRO contacts the donor of the specimen, determines if there is a medical diagnosis or condition impacting the results, reviews any documentation such as medications that may have impacted the drug screen results, determines if the drug screen was altered or adulterated in any manner, and submits a final report of the results of the drug screen

with any explanations (SAMHSA, 2018; Versalles, 2019). These guidelines are consistent with the SAMHSA Center for Substance Abuse Prevention recommendations for federal workplace drug screening programs (SAMHSA, 2018).

The opioid epidemic, escalating deaths associated with overdoses, and the need to protect the public has been driving force in the implementation of new laws. These changes have impacted how providers prescribe controlled substances with the goal of improving patient safety. Nurses are not immune to the development of SUD; therefore, the NPA permits the NCBON to offer an AP to support the mandate of public protection while offering a non-disciplinary opportunity for a recovering nurse.

Summary

This review of the literature has elucidated the current state of knowledge about SUD's impact on society and healthcare professionals, specific variables associated with SUD in nurses and the nursing work environment, and regulatory and legislative actions related to SUD. Dissemination of knowledge through understanding of the BPS domains that influence the development of SUD and subsequent recovery is critical to advancing nursing practice and nursing regulation.

Literature specific to the use of the BPS model as it applies to nurses in an AP is limited. In NC, an estimated 16,000 licensed nurses are affected by some degree of a SUD, therefore knowledge of BPS domains that contribute to the development of a SUD in nurses is urgent and a matter of saving lives. A SUD impacts not only the individual with the diagnosis, but also communities, families, friends, employers, colleagues, and patients who are all affected by the devastation and chronicity of this illness.

There is limited current research about the characteristics of nurses who complete or do not complete a non-disciplinary drug monitoring program like an AP. Nursing regulators are in a place to impact patient safety while providing a structurally sound non-disciplinary drug monitoring program that enhances patient safety while appropriately reintegrating a nurse into practice. A comprehensive understanding of the BPS variables associated with SUD in nurses could enhance nursing regulators mandate of public protection while simultaneously providing supportive and individualized plans of action for nurses affected by this disorder.

There are many variables associated with SUD in the nursing profession such as nurses not seeking help, fear of licensure action with a result of not being able to practice, and fear of the stigma associated with being labeled as a "drug user." Men in nursing are consistently reported in the literature as being overrepresented in DMPs; however, no literature was found that offered a clear rationale for why men are overrepresented. Research about the characteristics of nurses who complete or do not complete the AP is needed to understand what is contributing to this to ongoing healthcare crisis within the nursing profession.

CHAPTER 3: METHODOLOGY

The purpose of this study was to examine the characteristics of nurses enrolled in the

North Carolina Board of Nursing's (NCBON) Alternative Program (AP), to explore the

differences between the characteristics of nurses who complete the AP and those who do not, and

to examine the relationships among biopsychosocial (BPS) variables. This study used a database

of nurses who enrolled in the NCBON AP from January 1, 2011 to December 31, 2014. This

chapter provides an overview of the design, sample and setting, protection of human subjects,

theoretical framework, procedures, data analyses and methodological limitations.

Design

This study was a retrospective analysis of data from 289 nurses who enrolled in the

NCBON AP from January 1, 2011 to December 31, 2014. The primary state of licensure and

residence for each participant was NC. According to the NCBON, all nurses who met the

inclusion criteria for participation in the AP during this timeframe and consented to enter the AP

were included in the data set. Each nurse participant had at least one substance use disorder

(SUD) diagnosis. The PI identified four nurses who transferred to another state board of

nursing's AP who were excluded from the analysis. The total sample size for this study was 285.

Sample and Setting

The data set used in this research included deidentified information collected from North

Carolina licensed nurses (Licensed Practical Nurses [LPN], Registered Nurses [RN], and

Advanced Practice Registered Nurses [APRN]) who participated in the NCBON AP from 2011

to 2014. Each of the participants were diagnosed with a substance use disorder (SUD) and

voluntarily agreed to enter the NCBON AP. The sample does not represent all nurses who came

to the attention of the NCBON due to a substance abuse concern. Nurses may have chosen to

voluntarily surrender their license or did not meet the inclusion criteria to enter the AP. To protect the identity of each AP participant, data were de-identified by removing the participants' names, certificate numbers, dates of birth, and zip codes prior to releasing the data set to the researcher. A random number was assigned by a NCBON staff member to permit obtaining any missing data and to facilitate requests for additional data. The data shared by the NCBON to the primary investigator (PI) did not include any identifiable information that could result in a potential breach of the AP participants' confidentiality.

The data set used in this study was created in a Microsoft Excel spreadsheet after the NCBON submitted to a voluntary external review of the AP by the Citizens Advocacy Center (CAC) and consisted of 77 variables identified by the NCBON. The data were collected by the NCBON for quality improvement measures. The NCBON utilized an advisory committee of experts to implement program structure changes to the AP. The experts included a team of representatives from the: North Carolina Nurses Association, North Carolina Licensed Practical Nurses' Association, State Bureau of Investigations, and an employee assistance program representative. In addition, a recovering nurse, nurse employer, physician who was board certified in addiction medicine, and a treatment facility representative also participated on the advisory committee. The primary responsibility of the advisory committee was to make recommendations to the NCBON for any changes to the program. The advisory committee ended in 2015 and the NCBON now utilizes an ad hoc committee for expert opinions.

Protection of Human Subjects

University and Medical Center Institutional Review Board approval was obtained to prepare the data set for analysis. The study was approved as exempt based on the use of de-identified data and was deemed as not human subject research. The IRB approval letter is in

Appendix A. Permission to utilize the data set was obtained by the Chief Executive Officer of the NCBON. The permission letter can be found in Appendix B.

The data set was provided via an internal NCBON secure Office 365 teams site by the NCBON to the researcher with no participant identifiable information contained in the data set. The researcher secured the data set on a password protected computer. The data were shared with members of the dissertation committee via a secured, 2-factor authorization process available at East Carolina University to securely share data or other information related to research.

Theoretical Framework

The theoretical framework that guided this study was the Biopsychosocial Model developed by George Engel in 1977. Engel (1977) developed the model to include three domains of health and illness. The three domains are biological, psychological, and sociological. According to Engel (1977), each of these three domains interact with each other and can help explain health and illness in a holistic context. The variables were divided into each of the three domains of the biopsychosocial model (biological, psychological, and sociological variables) for data analysis.

Procedures

During the exploration of the literature, it was discovered that predictive variables for completing an ATD program, such as the NCBON AP, were not clearly identified. To address this gap, a survey was distributed to an interprofessional panel of SUD experts with the aim of identifying key variables within the data set that could predict AP completion. This study modification did not require additional UMCIRB approval. Based on the researcher's experience and the literature review, a total of 47 variables were initially identified for analysis. However, to reduce the number of variables for analysis, and to select BPS variables that more closely aligned

with the theoretical perspective and what is known about SUD in nurses, particularly variables that lead to successful completion of the AP, expert opinion was sought.

The survey was purposefully sent to 43 participants identified by the researcher as having expertise in regulatory aspects of drug monitoring programs ($n = 27$), administrative law attorneys ($n = 3$), psychiatric mental health nurse practitioners who were both educators and clinicians treating individuals with SUD ($n = 5$), and researchers in the United States and Canada with publications related to nurses with SUD ($n = 8$). The Qualtrics survey included the 47 variables initially identified by the researcher. Variables that were deemed by the researcher as having no impact on AP completion were not included in the survey. Respondents were asked to select no more than 25 variables from the list of 47 variables. They were not asked to rank the variables. A reminder survey was sent 5 days after the first survey. The survey can be found in Appendix E.

Of the 43 emails sent, three email messages were reported as undeliverable, reducing the number of potential respondents to 40. The response rate for the survey was 40% ($n = 16$). Variables selected by 8 or more participants were retained for analysis.

The variables selected by the expert panel as being relevant to the analysis of SUD in nurses were prior treatment for SUD, type of treatment, SUD diagnosis, months of abuse, family history of SUD, home life stress, work stress, primary reason for use (for example, pain), chronic medical conditions (e.g. pain diagnoses, orthopedic injuries, or mental health) with prescribed controlled substances, and a mental health diagnosis. Based on the review of the literature, drug of choice category, return to work, history of mental, physical, or sexual abuse, and IV drug use were also retained for analysis.

Data Analyses

To prepare the data set for analyses, the data were cleaned and reviewed for missing data points. The complete data were transferred and analyzed with SPSS Version 26 and SAS Software Version 9.4.

Descriptive statistics, frequencies, and percentages were obtained for each categorical variable. Missing data points were identified through frequencies in the descriptive data (Pallant, 2016). Descriptive statistics are used to describe and interpret the data to make inferences about the population being studied (Polit & Beck, 2017). For each continuous variable, minimum, maximum, interquartile range, mean, and standard deviation were obtained. Using SPSS, the split file function was utilized to divide the participants who completed the AP and did not complete the AP into groups. The split file was analyzed to obtain descriptive statistics for both the categorical and continuous variables. A statistical significance of (α) .05 was used for the analyses. According to Polit and Beck (2017) statistical significance does not imply importance but instead indicates the results are not by chance. For each research question, the specific statistical analyses are presented.

Correlational research was used to explore relationships among variables (Polit & Beck, 2017). The relationship was reported as the Pearson's correlation coefficient (*r*) and can range from -1 (negative correlation) to +1 (positive correlation; Mackridge & Rowe, 2018). A positive correlation indicates as one variable increases, the other variable increases (Pallant, 2016). Correlations measure the direction of the linear relationship between two variables (Tabachnick & Fidell, 2007). A negative correlation indicates as one variable increases, the other variable decreases (Pallant, 2016). If there is a not a relationship between variables, the correlation coefficient would be closer to 0 (Polit & Beck, 2017). To determine the strength of the

relationship between variables Cohen (1988) suggests specific guidelines. The effect sizes, or strengths of relationship calculations are small ($r = .10$ to .29), medium ($r = .30$ to .49), and large ($r = .50$ to 1.0; Pallant, 2016). Pearson correlation should be used when at least one variable is continuous (Pallant, 2016). Polychoric/tetrachoric correlations should be used to evaluate the correlation between two categorical variables and is interpreted using the guidelines identified for Pearson correlations (Tabachnick & Fidell, 2007).

Inferential statistics are used to make inferences about a sample (Polit & Beck, 2017). The chi-square test is used to test a hypothesis about group differences (Polit & Beck, 2017). A Fisher's exact test should be used when the expected cell frequency is less than five (Polit & Beck, 2017). The odds ratio is the odds of being in one category of the outcome variable when the value of the predictor variable increases (Tabachnick & Fidell, 2007). Crosstabs is the crosstabulation of frequency distribution of two categorical variables (Polit & Beck, 2017). Logistic regression predicts group membership based on a set of variables (Tabachnick & Fidell, 2007). The outcome variable is often categorized as yes/no (Tabachnick & Fidell, 2007). Logistic regression is frequently used in health science research and does not have assumptions related to the distribution of the predictor variables (Tabachnick & Fidell, 2007). Logistic regression is used to identify the best fitting model that describes the relationship between an outcome variables (response or dependent variable) and the predictor variables (explanatory or independent variables; Hosmer et al., 2013).

This study was guided by the following research questions.

Research Question 1: What is the demographic composition of licensed nurses participating in the North Carolina Board of Nursing's (NCBON) Alternative Program (AP) for substance use disorder (SUD) from January 2011 to December 2014? To answer this research

question descriptive statistics and frequencies were calculated for the complete data set. For the categorical variables frequencies and percentages were used. The minimum, maximum, mean, interquartile range, and standard deviation were calculated using SPSS for continuous variables such as age at referral to the AP, years in nursing upon entry into the AP, months of drug use, and days between enrollment in the AP and returning to nursing practice.

Research Question 2: What is the relationship among biopsychosocial domains (biological, psychological, and social) in licensed nurses diagnosed with a substance use disorder (SUD) who participated in NCBON's AP from January 2011 to December 2014? Correlations were used to explore and analyze the variables in context of the biopsychosocial factors.

Research Question 3: Is there a difference among biopsychosocial domains (biological, psychological, and social) in licensed nurses in the AP who completed the program compared to those who did not complete? The variables identified as statistically significant in research question two were used to answer this question. The data were split into two groups: nurses who completed the AP and nurses who did not complete the AP. The data were analyzed for the differences between the groups. Descriptive statistics and correlations were obtained. Chi-square or Fisher's exact test were utilized based on the expected cell frequency. Stepwise logistic regression modeling was used to analyze which variables seem to predict best AP completion.

Research Question 4: Is there a relationship between a co-occurring mental health diagnosis or chronic pain and a licensed nurse's completion of AP? Frequencies percentages, and chi-square were obtained for each variable. Pearson correlation was used to explore the relationships among co-occurring mental health diagnosis and chronic pain with nurse completion of AP.

Methodological Limitations

The primary methodological limitation of this retrospective study was the use of a preexisting data set. A preexisting data set can limit the addition of other variables of interest to supplement information that may be helpful in addressing the research questions. However, a process was identified and implemented to request and obtain missing data points and add specific variables of interest while maintaining the anonymity of AP participants. Additionally, there is a risk of data reliability due to the self-report nature of the data (Polit & Beck, 2017). Specifically, nurses may have been hesitant to answer certain questions or to answer honestly due to perceived fear of additional impact on nursing licensure, or potential criminal prosecution. Some participants had pending criminal charges at the time of entry and may have been advised by their attorney to only disclose certain information.

Due to the sensitive nature, confidentiality requirements, and the data being anonymous, contact with participants of the AP to gather additional information was not possible. Much of the data obtained for the data set was through treatment records, addictionologist reports, and NCBON compliance staff documentation. Due to manual entry by NCBON staff, there is the potential of human error in data entry.

The dataset used for this study does not represent all licensed nurses identified by the NCBON as having a practice-related event involving drugs and/or alcohol from January 1, 2011 to December 31, 2014. Since the data set in this study only included nurses in the AP, this makes extrapolating the results to nurses with a SUD that were not included in the dataset difficult. Small sample size may result in failing to show a relationship between independent and dependent variables (Polit & Beck, 2016). Furthermore, all nurses who were identified with a SUD may not be represented. Some participants may have surrendered their license, did not

qualify for the non-disciplinary alternative program, or evidence did not support a drug or alcohol related violation of the Nursing Practice Act. Therefore, the generalizability of the study findings was limited to NC nurse participants who voluntarily enrolled into the AP during this timeframe. Despite these limitations, this research has potential benefits to the nursing profession, nurses with SUD, nursing regulators, and employers of nurses.

Summary

This chapter discussed the methodology that was used to explore the BPS variables that lead to licensed nurses' completion or non-completion from the NCBON AP from January 1, 2011 to December 31, 2014. Descriptive statistics were used in the preliminary analysis to analyze variables such as age, gender, race, level of licensure, education, years in nursing, practice location, treatment type, drug of choice, specific substance abuse diagnosis, referral reason, and method of drug use. Correlations and logistic regression were conducted to determine the relationships among the variables of interest and the outcome (AP completion).

The findings of this study will add to the body of knowledge about biopsychosocial variables associated with SUD in a specific nursing population. In addition, this study will expand nursing regulatory research about SUD programs for nurses to provide clarity about the impact of SUD and AP programs on nursing practice and public safety. The analyses of the findings are presented in Chapter 4 and 5.

CHAPTER 4: CHARACTERISTICS OF NURSES IN THE NORTH CAROLINA BOARD OF NURSING'S ALTERNATIVE PROGRAM FOR SUBSTANCE USE DISORDER: A DESCRIPTIVE STUDY

Abstract

Aim: To describe the demographic composition of a cohort of nurses in the North Carolina Board of Nursing's Alternative Program (NCBON AP) for substance use disorder (SUD) to promote early detection of diversion behaviors and swift entry into treatment.

Background: Insufficient data are available on the demographic composition of nurses with SUD participating in the NCBON AP.

Methods: A descriptive analysis was conducted on a data set of nurses diagnosed with a SUD who enrolled in the NCBON AP from January 1, 2011 to December 31, 2014 ($N = 285$).

Results: Less than half of the nurses completed the AP (44.2%; $n = 126$). The mean age for a nurse at entry into AP was approximately 39 years and most were registered nurses (85.2%; $n = 243$). This study identified 65.3% ($n = 186$) of the sample abused opioids. About 20% ($n = 56$) of the AP participants used substances via multiple routes of administration. Nurses obtained controlled substances by creating waste (32.3%; $n = 92$) and removing but not administering substances to patients (26.3%; $n = 75$). Nurses with a SUD were detected due to impairment signs and symptoms while on duty (24.6%; $n = 70$), discrepancies identified in a controlled substance audit (18.2%; $n = 52$), and high user or waste reports (15.4%; $n = 44$).

Conclusions: Nursing leadership has a critical opportunity to identify nurses with a SUD, develop policies to assist in identifying nurses with SUD, make referrals, and collaborate with a state board of nursing to foster entry into an AP.

Implications for nursing management: A comprehensive understanding of the characteristics of nurses with a SUD can assist nursing leadership in early identification and promote referrals to alternative-to-discipline programs, thereby ensuring safe, quality care for patients and rapid engagement of SUD treatment for nurses.

Keywords: substance use disorder, alternative to discipline program, nursing regulation, diversion

Introduction

In the United States, approximately 10-15% of nurses have a diagnosis of a SUD (Bell et al., 1999; Bozimowski et al., 2014; Dunn, 2005; Monroe et al., 2013; Shaw et al., 2004). These percentages have the potential to increase due to disruption in treatment services, loss of income, increased stress, and increased isolation related to the COVID-19 pandemic (Lopez-Pelayo et al., 2020). Nurses are reported to be affected by substance use disorder (SUD) at a similar incidence as the general population (Kunyk, 2015; NCBSN, 2011); however, a nurse with an untreated SUD is in a direct position to negatively impact patient health and safety. The chronic, progressive nature of SUD poses a potentially fatal health risk to individuals (Griffith, 1999) and nurses are not immune to this detrimental consequence. Several factors contribute to the development of SUD in nurses that include workplace access and knowledge of controlled substances, a sense of immunity to addiction (Kenna & Lewis, 2008), and demanding professional duties with long work hours (Schluter et al., 2012; Trinkoff et al., 2000). Darbro (2005) concluded that nurses who worked in fast-paced, stressful environments such as emergency departments, intensive care units, and oncology units had higher rates of participation in a drug monitoring program (DMP). Mumba and Kraemer (2019) identified long-term care (32%), medical-surgical units (36%), and outpatient services which includes home health and hospice (32%) as areas of practice with the highest participation in a DMP. Regardless of the practice setting, a nurse with an untreated SUD poses significant risks to patients, healthcare organizations, and to themselves.

According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2020b), a SUD is defined as a "recurrent use of alcohol and/or drugs causing significant impairment including health problems, disabilities, and failure to meet major

responsibilities at work, home or school." The National Institute on Drug Abuse (NIDA) describes addiction as a chronic, complex, and treatable disease that requires treatment approaches specific to each person (NIDA, 2020).

From 2015 to 2018 the opioid epidemic impacted the U.S. economy by $631 billion in healthcare expenditures, premature mortality, criminal justice expenses, lost work productivity, and funding of government programs (Davenport et al., 2019). Governmental funding to combat the opioid epidemic was primarily focused on state and federal insurance programs and programs for children and family members of individuals with a SUD (Davenport et al., 2019). To fill the gap related to individuals obtaining treatment for SUD, state-funded drug rehabilitation programs were developed (Levy, 2020). In North Carolina (NC), financial grant assistance was received from SAMHSA for the development of programs and assistance for mental health disorders, treatment of opioid use disorder, and prevention and treatment for at-risk individuals (NC DHHS, n.d.-a). Although the costs to the economy and society are significant, there is also financial burden from opioid addiction on individual healthcare facilities and the insurance industry. According to the 2020 Protenus Diversion Digest (PDD), about 148 million doses of controlled substances were diverted in 2019 with an estimated $183 million loss reported by healthcare organizations. The most common diverted controlled substances reported by the 2019 PDD were oxycodone, hydrocodone, and fentanyl. Nurses have access to controlled substances such as opioids in their professional roles (Cares et al., 2015; Dittman, 2008), and able to observe patient responses to opioids making them feel confident in the safety of self-medicating through diversion of controlled substances from healthcare facilities (Foli et al., 2020). Lindsay (2016) reported that diversion of controlled substances by nurses and other healthcare professionals

resulted in public and private healthcare insurance carriers losing an estimated $72.5 billion

dollars per year.

While the exact number of nurses with a SUD is unknown, based on national percentages

it can be estimated that of the almost 6 million nurses in the United States (NCBSN, 2020b)

approximately 600,000 have some degree of a SUD. This is a public health concern that requires

the attention of boards of nursing and employers of nurses. Despite the Surgeon General (2016)

urging immediate action to address the national opioid epidemic and the increasing incidence of

drug-related overdose deaths (United States Department of Health and Human Services [U.S.

DHHS], 2016), there has been limited nursing regulatory research regarding state boards of

nursing alternative-to-discipline (ATD) programs. Action is needed to prevent further overdose

deaths and to educate nursing leadership. The purpose of this study was to describe the

demographic composition of nurses in North Carolina Board of Nursing's Alternative Program

(NCBON AP) to promote early detection of diversion behaviors and swift entry into treatment.

Background and Significance

There is clearly a need to identify nurses with a SUD to provide them with treatment

options that include drug monitoring and addiction support. Cares et al. (2015) surveyed 302

nurses participating in a DMP. Among those surveyed, 48% reported using substance(s) while at

work, and 40% felt the substance(s) used negatively affected their nursing practice. The fact that

nearly half of nurses in this study reported using substances while at work and were aware of

their substance-induced impairment is alarming and highlights the need for swift action to

protect patients and the public.

According to Lillibridge at al. (2002), nurses with a SUD perceived they were viewed as

frail with no self-discipline and had the "undesirable characteristics of addicts" (p. 227). Fear of

seeking treatment and disclosing private information about substance use history to potential employers were identified as contributing to perceived stigma (Darbro, 2005; Lillibridge et al., 2002). Participants (*n* = 100) who sought treatment for SUD reported barriers to seeking treatment for SUD due to the responsibilities of raising a family, lack of childcare, stigma of being a parent with a SUD, and fear of losing custody of children (Agterberg et al., 2020). Nurses are often conflicted about seeking assistance or treatment for SUD due to a stigmatized culture of healthcare professionals towards individuals with SUD (Horton-Deutsch et al., 2011; Matthias-Anderson & Yurkovich, 2016) and fear of loss of nursing licensure and income (Brown et al., 2003; Cares et al., 2015; Dittman, 2012).

According to the National Council State Boards of Nursing (NCSBN; 2011), ATD programs were established to offer nurses a non-punitive option for treatment when practice is impaired or impacted by mind-altering substances. The NCSBN (2011) defines an alternative program for SUD as a "voluntary, non-public and non-disciplinary program, which offers an alternative to traditional discipline authorized in statute and rule by nursing or other regulatory board" (p. 235). A state must have statutory authority to implement an ATD program and must go through rulemaking processes to establish an ATD program (Dunn, 2005; NCSBN, 2011). An ATD program option is a more expedient approach to placing a nurse impaired by a SUD into a treatment program than a disciplinary approach that requires a formal investigation into the nurses' actions (Monroe & Kenaga, 2011; NCSBN, 2011; Privette et al., 2015). The enforcement of ATD programs can prevent delayed entry into treatment, reduce safety risks to the public, and return the nurse to practice (Brown et al., 2003; Fogger & McGuinness, 2009; Kunyk, 2015) as opposed to a punitive approach to addressing SUD. However, denial (Russell, 2017; Samuleson & Bryson, 2017) and perception that drug use can be controlled (Samuleson & Bryson, 2017)

may prevent a nurse from seeking treatment or entering an ATD program. Each state's ATD programs vary in structure and requirements, but all meet statutory requirements of public protection (NCSBN, 2011). Variations include length of programs, requirements for substance use treatment, stipulations, or restrictions upon re-entering the nursing workforce, and drug testing requirements (Matthias-Anderson & Yurkovich, 2016; Monroe et al., 2013; NCSBN, 2011). The differences in program structure of ATD programs make it difficult to compare factors and outcomes related to program completion and termination across programs (Matthias-Anderson & Yurkovich, 2016; Monroe et al., 2013). In addition to monitoring nurses with a diagnosis of SUD, some state ATD programs also monitor nurses who need structured support due to a primary mental health diagnosis (Mumba et al., 2019a).

According to Cadiz et al. (2015), there are 39 ATD programs in the U.S. that are operated by state boards of nursing or outsourced to peer assistance programs. Of the data available, 16 member boards do not have an ATD program (NCSBN, 2020a). In support of a non-disciplinary and non-punitive approach to how nurses with SUD are treated, a shift in the nursing profession from a stigmatized culture of SUD to an empathetic and evidence-based approach is necessary (Worley, 2017) and this can be accomplished through ATD programs and education.

The NCBON offers a non-disciplinary AP, also referred to as an ATD program, for NC licensed nurses with a SUD. The NC Nursing Practice Act (NPA) gives the NCBON the authority to offer a program "for aiding in the recovery of nurses who experience chemical addiction or abuse" and to monitor safe practice (NPA, 2019). The mission of the AP "is to protect the public by providing a structured approach to monitoring and returning the recovering chemically dependent nurse to safe nursing practice" (NCBON, 2020). The AP is a one-time opportunity for nurses in NC. The four objectives of the NCBON's AP are public safety through

monitoring of nurses, intervention to decrease time between nurses' acknowledgement of SUD and starting the treatment and recovery process, returning nurses to practice, and providing a non-punitive, non-public approach to recovery of nurses with SUD (NCBON, 2020).

Methods

The NCBON established an ATD program (AP) in 1995. Data were collected on a cohort of licensed nurses enrolled in the NCBON's non-disciplinary AP. The number of AP participants does not include nurses who chose to voluntarily relinquish their nursing license, did not respond to the NCBON's inquiry, or were not eligible for the AP. This study aimed to answer the follow question: What is the composition of licensed nurses participating in the North Carolina Board of Nursing's (NCBON) Alternative Program (AP) for SUD from January 2011 to December 2014?

Design

This was a descriptive, secondary analysis of a data set of nurses diagnosed with a SUD who entered an agreement with the NCBON to participate in the AP from January 1, 2011 to December 31, 2014.

Sample

The sample consisted of 285 nurses who entered the NCBON AP. The AP requires nurses to be monitored for at least 3-5 years (NCBON, 2020). Data collection concluded in 2018 after each nurse in this cohort either completed the AP or did not complete the AP. All nurses who met the inclusion criteria for participation in the AP from 2011-2014 were included in the data set. The sample consists of licensed nurses (Licensed Practical Nurses [LPN], Registered Nurses [RN], Advanced Practice Registered Nurses [APRN]). The data did not include any potentially identifying information.

Procedures

After obtaining University and Medical Center Institutional Review Board approval, data were de-identified by the NCBON by removing nurses' names, certificate numbers, dates of birth, and zip codes prior to analyses. A random number assignment process was used to identify each nurse in the data set and to communicate with the NCBON when missing data or additional data points were identified.

Statistical Analysis

Statistical analyses were performed utilizing SPSS version 26.0 and SAS version 9.4. The data were described by frequency and percentages for categorical variables, and mean, standard deviation, and interquartile range (IQR) were utilized to describe the continuous variables.

Results

The majority of the sample were female (81.1%; $n = 231$), White (87.4%, $n = 249$), and were licensed as a registered nurse (RN) in North Carolina (85.2%; $n = 243$; Table 1). North Carolina recognizes four advanced practice registered nurse (APRN) roles; however, only certified registered nurse anesthetists (CRNA) and nurse practitioners (NP) were identified in the sample of APRNs. Over half of the sample (56.8%; $n = 162$) had an associate degree in nursing and approximately 25% ($n = 24.6\%$) had a bachelor's degree in nursing. The largest age category was the 30-39-year-old group (40.4%; $n = 115$) followed by the 40-49-year-old group (27%; $n = 77$). The most common practice location at the time a nurse was reported to the NCBON was a hospital (72.6%; $n = 207$). The specific practice setting within a hospital was medical-surgical/oncology/cardiac (27%; $n = 77$), followed by the emergency department (17.9%; $n = 51$), and intensive care units (11.2%; $n = 32$). Approximately 27% ($n = 76$) were not practicing in a hospital setting. The shifts typically worked by nurses prior to entry into the AP were almost

evenly divided between 12-hour shifts (42.4%; *n* = 121) and 8-hour shifts 44.2%, *n* = 126). The

majority worked dayshift (7 am to 7 pm or 7 am to 3 pm; 52.3%; *n* = 149). Most nurses (58.6%;

n =167) who were identified in a complaint to the NCBON were terminated from employment.

The analysis identified that 126 (44.2%) of participants completed the AP.

Table 1

Participant Demographics ($N = 285$)

	n	*%*
Gender		
Male	54	18.9
Female	231	81.1
Race and Ethnicity		
White	249	87.4
Black	17	5.9
Biracial	6	2.1
Hispanic/Latino	5	1.7
Asian	3	1.1
Native American	3	1.1
Other	2	0.7
Highest Education		
Diploma-LPN	26	9.1
BSN	70	24.6
Diploma-RN	11	3.9
ADN	162	56.8
Masters	16	5.6
License Type		
LPN	26	9.1
RN	246	86.3
CRNA	7	2.5
NP	6	2.1
Years in Nursing		
0-5	98	34.4
6-10	83	29.1
11-15	40	14.0
16-20	26	9.1
≥21	38	13.3
Age Category		
20-29	52	18.2
30-39	115	40.4
40-49	77	27.0
≥50	41	14.4
Employment Status		
Leave of absence	63	22.1
Resigned	45	15.8
Terminated	167	58.6
Not reported	10	3.5

Note. LPN = Licensed Practical Nurse; RN = Registered Nurse; CRNA = Certified Registered Nurse Anesthetist; NP = Nurse Practitioner; AP = Alternative Program.

The mean age of a nurse when referred to the AP was 38.4 years (*SD* = 9.2; Table 2). The

years licensed as a nurse ranged from 0-40 (*M* = 10.4, *SD* = 8.6). The number of days from

enrollment in the AP to returning to nursing practice averaged 354.7 days (*IQR* = 170.5-441.0,

SD = 239.3). The time between formal complaint submitted to the NCBON by the reporting

agency and the nurse entering treatment (*n* = 280) averaged 44 days (*SD* = 71.8). The mean

length of time a nurse participated in the AP was 1946 days (*SD* = 39.8).

Table 2

Participant Characteristics

Variable	*N*	Missing Values	Min	Max	Q1	Q2	Q3	*M*	*SD*
Age at Referral	285	0	23	64	30.98	37.34	45.27	38.39	9.22
Years in Nursing at AP start	285	0	0	40	4.04	7.59	14.40	10.39	8.57
Enrollment to RTW (days)	154	131	0	1686	170.50	262.00	441.00	354.68	293.29
Length of time in AP (days)	275	10	15	1946	157	862	1386	835.22	639.78

Note. Q1 = first quartile' Q2 = second quartile; Q3 = third quartile (Q1, Q2, Q3 = Interquartile range); AP = Alternative Program; RTW = Return to work.

The primary drug of choice by the nurse in the AP was opioids (65.3%, *n* = 186)

followed by alcohol (20%, *n* = 57). The primary opiates reported as abused were oxycodone

(44.2%, *n* = 126), hydromorphone (34.7%, *n* = 99), , oxycodone/acetaminophen (23.9%, *n* = 68),

hydrocodone (22.8%, *n* = 65), and morphine (20.4%, *n* = 58). Nurses in the AP primarily

consumed opiates orally (*n* = 115), intravenous only (*n* =45) and through various combinations

of oral, intramuscular and/or intravenous routes (*n* =56). The illicit substances reported as abused

by nurses upon entry into the AP was marijuana (n = 12) followed by cocaine (n = 8) and crystal

methamphetamine (n = 1).

The primary method for how nurses obtained the substances used was by creating wastes

for controlled substances (32.3%, n = 92) followed by removing a substance under a patient's

name but not documenting the controlled substance as administered (26.3%, n = 75; see Table 3).

Some nurses reported obtaining their drug of choice illegally via a "street" purchase (17.2%, n =

49).

Table 3

Sources of Substances Obtained by Nurses

	n	$\%$
Used/Created Waste	92	32.3
Signed out, not administered	75	26.3
Street	49	17.2
Medications misused	48	16.8
Took family/friend medication	46	16.1
Doctor shopping	24	8.4
Pulled 2 C/S gave 1	17	6.0
Prescription forgery	14	4.9
Diverted from supply cabinet	13	4.6
Sharps container	6	2.1
Picked up meds from pharmacy	3	1.1
Used co-workers access info	3	1.1
Took SRK after patient expired	2	0.7
Diverted from patient supply	2	0.7
Diverted from intravenous line	2	0.7
Did not return meds to pharmacy	1	0.4
Used animal meds	1	0.4
Removed meds without orders	1	0.4

Note. C/S = controlled substance; Meds = medications; SRK = symptom relief kit

Nurses were detected by their employers, pharmacists, or law enforcement through

various mean (Table 4). The primary means of detection were impairment (24.6%, n = 70),

followed by audits conducted with identified discrepancies in documentation of controlled

substances (18.2%, *n* = 52), high user reports (15.4%, *n* = 44) and staff concerns (11.9%, *n* = 34).

Table 4

Substance Use Detection

	n	*%*
Impaired on duty	70	24.6
Audit with doc discrepancies	52	18.2
High user/waste report	44	15.4
Staff concerns	34	11.9
Patient complaint	16	5.6
Missing medications	16	5.6
Observed	15	5.3
DWI conviction	15	5.3
Pharmacist questioned Rx	14	4.9
Frequent bathroom breaks	9	3.2
Self-reported	8	2.8
Family member reported	8	2.8
Medicating pts not assigned	8	2.8
Found in desk/car/locker	5	1.8
Random drug test	4	3.2
Surveillance video	2	0.7
Pulling C/S off duty	1	0.4
Multiple pain meds to pts	1	0.4

Note. Doc = documentation; DWI = driving while impaired; Rx = prescription; Pts = patients; C/S = controlled substance; Meds = medications.

Discussion

The nursing community sometimes perceives state boards of nursing in a punitive light,

as agencies that have the authority to both issue and revoke nursing licenses under certain

circumstances such as a SUD. However, nurses whose practice is impacted by a SUD can

voluntarily enroll in a non-disciplinary ATD program to provide structured support and

staggered entry back into the nursing workforce. Research indicates about 41% of nurses

successfully complete ATD programs (Mumba et al., 2019a) and participation in these programs

outweighs the risk of continuing to allow impaired nurses to provide care for patients. The data

from this study identified 44% (*n* = 126) of nurses in the sample cohort completed the AP, resulting in an unencumbered license to practice nursing.

The percentages of nurses with a SUD in NC was not reflected in the number of the participants in this study. During the time period under investigation there were nurses who came to the attention of the NCBON for controlled substance diversion, impairment, or other concerns related to SUD; however, nurses may have chosen to voluntarily relinquish their nursing license rendering them ineligible for the AP program. In addition, a nurse's denial of a SUD may have resulted in a formal investigation and other potential licensure actions that rendered them ineligible for the AP program. Men account for approximately 8.5% of the nursing workforce in NC (NCBON, 2021) yet almost 19% of the nurses in this study were male. This was a consistent finding in other studies (McNelis et al., 2012; Mumba et al., 2019a). Men in the general population are more likely than women to have a SUD (Giacometti & Barker, 2020) but women are more likely to be diagnosed with a SUD and a co-occurring mental health diagnosis (Torrens et al., 2010) which may impact the decision to enter an ADP. The overrepresentation of males in the NCBON AP and the reasons for this overrepresentation requires additional investigation.

Both mental illness (psychiatric disorders) and SUD have a hallmark symptom of denial, and as a result, individuals often have limited insight into their exhibited behaviors and need for treatment (Malliarakis et al., 2012). The lack of specialized provider training about SUD with co-occurring diagnoses may pose barriers for individuals who need treatment for both SUD and other mental health illnesses (Blumenthal et al., 2001). Outpatient treatment services are limited for individuals with both SUD and mental health diagnoses as compared to inpatient or psychiatric services that may have established services specific for dual diagnoses (Timko et al., 2005).

The mean age of nurses in this study was 39 years with 10 years of nursing experience. This was similar to other studies of nurses in drug monitoring programs (Cares et al., 2015; Fogger & McGuinness, 2009; Mumba et al., 2019a). However, (Bowen et al., 2012) reported nurses in their study of nurses in an ATD program were slightly older at 41 years with only four years of nursing practice.

Of the 285 participants in this study only six were CRNAs. This was a concerning finding since the literature supports anesthesia providers have a higher rate of SUD than other healthcare professionals (Baldisseri, 2007; Bryson & Silverstein, 2008; Wright et al., 2012) and overdoses among CRNAs are often not identified until a near-death event (Wright et al., 2012). Easy access to controlled substances, specifically opiates such as fentanyl, places CRNAs at significant risk for SUD and drug overdose (Valdes, 2014; Wright et al., 2012). Additional investigation regarding risk factors for CRNAs and the substances abused is needed.

Although almost 73% of the nurses in this study were employed in a hospital setting at the time of the report to the NCBON, this does not mean that diversion, impairment, and nurses with SUD was not a significant issue in other healthcare settings. In practice settings other than hospitals there may be a knowledge deficit regarding the mandatory requirement to report "…misconduct or incapacity of a licensee or who has reasonable cause to suspect that any person is in violation…shall report the relevant facts to the Board" (NC Nursing Practice Act, 2019). Limited knowledge about what constitutes a violation, how to file a complaint, legal ramifications, and the culture of a facility were identified as barriers for not submitting complaints to a board of nursing (Martin et al., 2018).

The most common controlled substances diverted from healthcare facilities are opioids (Berge et al., 2012). Opioids have a high potential for abuse and are often diverted for personal

use to support an evolving SUD (Berge et al., 2012). Opiates and alcohol have consistently been reported in the literature as the top substances abused by nurses (McNelis et al., 2012; Mumba et al., 2019a; Pace et al., 2020). This study confirmed these findings with oxycodone and hydromorphone being abused by the majority of the sample. The primary means for obtaining controlled substances from the place of employment among participants in this study was creating wastes and removing but not administering the medication (diversion). These findings solidify the importance of monitoring removals, wastes, and documentation of controlled substances in the medical record through audits, high user reports, strong facility policies, and collaboration with pharmacy staff (New, 2014).

Conducting audits and monitoring activity related to controlled substances is a vital part of the identification; however, ensuring nurses have support for self-care are just as vital to the long-term health of the nurse and patient. Nurses and other healthcare workers have been at the forefront of the COVID-19 pandemic and have faced challenges to secure personal protective equipment, mental anguish due to patient medical complications and death, and fears related to uncertainty about the future. These challenges can lead to use of substances such as alcohol or opioids to combat feelings of despair or physical pain. Ongoing education about the signs and symptoms of SUD, impairment, and diversion are needed to identify and assist nurses with a SUD. High patient acuity and nurse staffing shortages that are typical in healthcare settings today can result in the symptoms of SUD being overlooked. Nursing leadership cannot let down their guard against SUD and must remain vigilant in monitoring nurses and educating staff to quickly identify and intervene to save patients' and nurses' lives. Nursing leadership should be knowledgeable of programs offered by state boards of nursing that explore SUD treatment options with nurses when concerns arise.

Conclusion

This study provides awareness of the characteristics of nurses who participated in an ATD program. Such awareness can begin to break away the stigma that is associated with individuals whose paths lead to abuse of substances. Paths can be altered without disciplinary licensure action that can pose harmful lasting effects on the lives of nurses. Although evidence is sparse regarding sentinel events that occur when nurses are impaired, this is a significant concern for nursing regulators, nursing leadership, and patients receiving nursing services.

Nursing leadership have a critical opportunity to identify nurses with a SUD, monitor nursing practice, develop strong policies to assist in identifying nurses with SUD, make referrals, and collaborate with a state boards of nursing to foster entry into an ATD program like AP. Submitting a complaint to a nursing board can be difficult, but there is a possibility that the complaint can be life-changing and even life-saving for nurses and patients.

Implications for Nursing Management

A comprehensive understanding of the characteristics of nurses with a SUD can assist nursing leadership in early identification and increase the speed of referrals to ATD programs, thereby promoting safe, quality care for patients, and rapid engagement of SUD treatment for nurses. Nursing leadership should periodically review and revise policies and procedures to identify drug diversion, collaborated with pharmacies to conduct audits, educate staff on identifying the hallmarks of nurse impairment, and conducting drug screening ensuring the drug of concern is included in the drug screen panel. Boards of nursing should ensure nursing leadership in all settings are aware of the means of entry, goals, and general length of APs as well as the potential for nurses in an AP to re-enter the nursing workforce. Most importantly, nursing leadership must create an environment that fosters willingness of staff members to report

concerns of diversion and impairment by providing consistent, evidence-based education and support.

CHAPTER 5: NORTH CAROLINA NURSES WITH SUBSTANCE USE DISORDER: A BIOPSYCHOSOCIAL EXPLORATION

Abstract

Objective: To explore the relationships among biopsychosocial variables in licensed nurses who enrolled in the North Carolina Board of Nursing's Alternative Program (AP) for substance use disorder (SUD) from January 2011 to December 2014.

Methods: A retrospective descriptive, correlational study was conducted of a sample of licensed nurses ($N = 285$) diagnosed with a SUD who enrolled in the AP.

Results: Returning to work, specifically nursing practice, while in the AP was highly correlated with completing the AP ($r = .94$). Additionally, prior treatment for SUD ($r = .12$), phentermine use ($r = .54$), prescribed controlled substances while in the AP ($r = .20$), and other abused drugs of choice (methamphetamines, amphetamines, polysubstance, and antihistamine; $r = -.43$) were correlated with completing the AP. A logistic regression analysis was performed that identified a unique statistically significant contribution of phentermine use and return to work. A concurrent mental health diagnosis and chronic pain were not statistically significant in relation to completing the AP.

Conclusion: These findings contribute to understanding the characteristics of nurses with SUD who enroll in an alternative to discipline (ATD) program like the North Carolina Board of Nursing's AP and the variables associated with completing the program. Returning to nursing practice while in an AP appears to be an important variable in the completion of an AP and possibly in the long-term maintenance of recovery for licensed nurses with a SUD. The unanticipated finding of an association between phentermine use and AP completion warrants further study.

Keywords: *substance use disorder*, *nurse*, *alternative to discipline program*, *returning to work*

Background

In the United States, it is estimated that 10-15% of nurses have a diagnosis of a substance use disorder (SUD; Bell et al., 1999; Bozimowski et al., 2014; Dunn, 2005; Monroe et al., 2013; Shaw et al., 2004) and these percentages have the potential to increase due to disruption in treatment services, loss of income, increased stress, and increased isolation related to the COVID-19 pandemic (Lopez-Pelayo et al., 2020). Nurses are reported to be affected by a SUD at a similar incidence as the general population (Kunyk, 2015; NCBSN, 2011), however, a nurse with an untreated SUD is in a direct position to negatively impact the health, safety, and welfare of patients. There is potential for patient injury or death (Foli et al., 2020; Kunyk, 2015), increased health care costs (Bowen et al., 2012), and nurse self-injury or death (Bowen et al., 2012; Monroe & Kenaga, 2010) when a licensed nurse has an undiagnosed or untreated SUD.

The neurobiology of SUD can be described as the impact on the brain and nervous system when addictive mind-altering substances are used (Koob & Volkow, 2016; Substance Abuse Mental Health Services Administration [SAMHSA], 2016). The brain's reward system is responsible for sensation of pleasure and is impacted when mind-altering substances cause a decrease in the effectiveness of dopamine in the reward center (NCSBN, 2011; NIDA, 2018; Wright et al., 2012). The three main areas of the brain that are involved in the development of a SUD are the basal ganglia, extended amygdala, and prefrontal cortex (SAMHSA, 2016). The basal ganglia control the reward center of the brain and are responsible for the pleasurable effects of substance use and the ongoing use of substances (SAMHSA, 2016). The extended amygdala is linked to feelings of stress and anxiety that are experienced with withdrawal (SAMHSA, 2016). The prefrontal cortex is known as the "executive function" of the brain and is responsible for

making decisions such as continued use of substances (SAMHSA, 2016). As an individual uses the substance(s) of choice, enjoys the feelings from the substance(s), and attempts to obtain the same sensations as from the first use, they begin to exhibit behaviors that lead to craving the substance(s) at incrementally higher amounts (NCSBN, 2011; Wright et al., 2012). As an individual develops a tolerance for the substance of choice, they require escalating amounts and increased frequency in substance use to get the same effect or feeling as the first time the substance was used (NIDA, 2018; SAMHSA, 2016). The "vicious circle of addiction" as described by Bettinardi-Angres and Angres (2010) involves a bio-genetic predisposition, initial use (reward), continued use (tolerance), escalation of use (chasing the feeling), maintenance use (withdrawal symptoms with impaired decision-making), and desperation use ("running on empty;" p. 34). Volkow et al. (2016) described three cyclic stages of addiction: "binge and intoxication," "withdrawal and negative effect," and "preoccupation and anticipation" (p. 365).

According to Miela et al. (2018), the neurobiological changes resulting from abuse of mind-altering substances are alteration of the reward system, overactivation of the brain stress system with compromised destressing, decreased impulse control, and inhibited response. The mesolimbic pathway or the reward pathway of the brain plays a significant role in the development of a SUD by increasing levels of dopamine (Massaly et al., 2016). The increase in dopamine results in drug seeking behaviors, less interest in life without drugs, and intense focus on use of the substance(s) of choice (Leyton & Vezine, 2014). As the cycle of substance use progresses, some individuals reach "a turning point" that leads to a change in behaviors and a desire to seek treatment (Darbro, 2005; Dittman, 2012; Ervin, 2015; Lillibridge et al., 2002; Pettersen et al., 2018). Volkow et al. (2016) found the development of addiction depends on varying genetic, environmental, and developmental factors such as family history of addiction,

exposure to drug use during adolescence, poor family support, socially stressful environments, easy access to drugs, an environment of socially acceptable drug use, and mental illness.

A commonly held belief prior to the 1980s was that an individual with an addiction had a moral defect, and their behaviors were a personal choice or individual issue with no external influencing factors (Heise, 2003; Kunyk et al., 2016). A transition in the philosophical approach to SUD in nurses began in the 1980s from disciplinary action, loss of licensure, and immediate criminal charges to understanding the biopsychosocial aspects of SUD (Heise, 2003). The currently accepted belief is that SUD is a behavior caused by a disease process with external contributing factors such as biological, psychological, and sociological influences (Kunyk et al., 2016).

There are several factors that contribute to the development of SUD in nurses such as workplace access, knowledge of controlled substances, a sense of immunity to addiction (Kenna & Lewis, 2008), demanding professional duties and long work hours (Schluter et al., 2012; Trinkoff et al., 2000). Nurses can be conflicted about admitting they need help or treatment for SUD due to a stigmatized culture of healthcare professionals towards individuals with SUD (Horton-Deutsch et al., 2011; Matthias-Anderson & Yurkovich, 2016) and fear of loss of nursing licensure and income (Brown et al., 2003; Cares et al., 2015; Dittman, 2012). A Joint Position Statement issued by the Emergency Nurses Association (ENA) and the International Nurses Society on Addictions (IntNSA) called for increased education regarding drug and alcohol abuse as a treatable disease process, the establishment of workplace and regulatory policies to promote retention and treatment, and support of alternative to discipline (ATD) approaches for SUD for both licensed nurses and student nurses (ENA & IntNSA, 2017).

An ATD approach rapidly removes a nurse from practice and engages the nurse in treatment for SUD instead of initiating a formal investigation into the nurses' actions which can delay treatment (Monroe & Kenaga, 2011; NCSBN, 2011; Privette et al., 2015). The opportunity to participate in ATD programs can prevent delayed entry into treatment, reduce safety risks to the public, and return nurses to practice safely as opposed to a punitive approach to addressing SUD (Brown et al., 2003; Fogger & McGuinness, 2009; Kunyk, 2015). However, returning to nursing practice generally occurs early in the SUD recovery journey and is marked by insecurity in relapse prevention, shame in having a SUD diagnosis, and being secretive about being in recovery (Matthias-Anderson & Yurkovich, 2016).

To understand the biopsychosocial variables impacting nurses with an SUD, a study of the participants of the North Carolina Board of Nursing Alternative Program (NCBON AP) was conducted. The NC Nursing Practice Act (NPA) gives the NCBON the authority to offer a program "for aiding in the recovery of nurses who experience chemical addiction or abuse" and to monitor for safe nursing practice (NPA, 2019). The mission of the AP "is to protect the public by providing a structured approach to monitoring and returning the recovering chemically dependent nurse to safe nursing practice" (NCBON, 2019a). The four objectives of the NCBON's AP are public safety through monitoring of nurses, intervention to decrease time between nurses' acknowledgement of SUD and starting the treatment and recovery process, returning nurses to practice, and providing a non-punitive, non-public approach to recovery of nurses with a SUD (NCBON, 2020). The AP, also referred to as an ATD program, is a non-disciplinary program for North Carolina licensed nurses with a SUD. The NCBON AP is not a treatment program. The NCBON monitors nurses for compliance with their provider

recommended level of treatment, attendance at self-help meetings like AA or NA, drug screening, and nursing practice upon return to the workforce.

Aims and objectives

The aims of this study were to identify biopsychosocial variables of nurses in the AP and variables associated with completion of the AP. The three objectives of the research were to (a) determine the relationships among the biopsychosocial domains among the nurses in the AP, (b) determine if there are differences among biopsychosocial variables in nurses who completed and did not complete the AP, and (c) determine if there is a relationship between a co-occurring mental health diagnosis or chronic pain and completion or non-completion of the AP.

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Methods

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Design

A retrospective descriptive correlational design was employed. This study was informed by the Biopsychosocial (BPS) Model developed by Dr. George L. Engel (1977) to explain health and illness within a holistic context. The BPS model is composed of three domains: biological, psychological, and sociological (Engel, 1977). These domains are believed to influence human behavior and response to medical conditions. In this study, biopsychosocial variables were analyzed in the context of SUD for nurses participating in the NCBON AP.

Participants and setting

The study utilized a data set of 289 nurses who entered the NCBON AP from January 1, 2011 to December 31, 2014. This timeframe permitted nurses to either complete or not complete the required components of the 3-5-year long program. Data collection for the study cohort ended in 2018. There were four nurses who transferred to another state board of nursing's ATD program and therefore were excluded from analysis. The total sample for this study was 285

nurses. The sample consisted of North Carolina licensed nurses (Licensed Practical Nurses [LPN], Registered Nurses [RN], and Advanced Practice Registered Nurses [APRN]). Each nurse in the sample was diagnosed with a SUD and signed an agreement to enter the AP. The number of AP participants in this study is not inclusive of all nurses the NCBON received a complaint about regarding a potential violation of the NPA related to abuse of substances. Some nurses may have chosen to voluntarily relinquish their nursing license, did not respond to the NCBON's inquiry, or were not eligible for the AP and therefore were excluded from AP participation.

Procedures

East Carolina University and Medical Center Institutional Review Board approval was granted for this study. The study was approved as exempt and not human subject research. Prior to releasing the data set to the researcher, data were de-identified by removing the participants' names, certificate numbers, dates of birth, and zip codes to avoid a potential breach of confidentiality. A random number was assigned to each participant by a NCBON staff member to facilitate requests for missing data. To prepare the data set for analyses, the data were cleaned and reviewed for missing data points. The complete data were transferred into SPSS Version 26 and SAS Software Version 9.4 for statistical analyses.

Missing data points were identified through frequencies in the descriptive data (Pallant, 2016). Descriptive statistics, frequencies, and percentages were obtained for each categorical variable. Descriptive statistics are used to describe and interpret the data to make inferences about the population being studied (Polit & Beck, 2017). For each continuous variable, minimum, maximum, interquartile range, mean, and standard deviation were calculated. Using SPSS, the split file function was utilized to divide the participants who completed the AP and did not complete the AP into groups. The split file was analyzed using descriptive statistics for both

the categorical and continuous variables. A statistical significance of (α) .05 was used for the analyses.

A researcher-developed survey was sent to 43 participants identified as experts in regulatory aspects of drug monitoring programs ($n = 27$), administrative law attorneys ($n = 3$), psychiatric mental health nurse practitioners who were both educators and clinicians treating individuals with SUD ($n = 5$), and researchers in the United States and Canada with publications related to nurses with SUD ($n = 8$). Of the 43 emails sent, three email messages were reported as undeliverable, reducing the number of potential respondents to 40. The participants were provided a list of 47 variables and were asked to select up to 25 variables as important variables in predicting AP completion. The response rate for the survey was 40% ($n = 16$). Variables selected by 8 or more participants were retained for analysis.

The variables selected by the expert panel as being relevant to the analysis of SUD in nurses were prior treatment for SUD, type of treatment, SUD diagnosis, months of abuse, family history of SUD, home life stress, work stress, primary reason for use (for example, pain), chronic medical conditions with prescribed controlled substances, and a mental health diagnosis. Based on the review of the literature, drug of choice category, return to work, history of mental, physical, or sexual abuse, and IV drug use were also retained for analysis.

Data analyses

Descriptive statistics including frequencies and percentages were calculated for each categorical variable, while the minimum, maximum, mean, standard deviation, and interquartile range were calculated for the continuous variable. Chi-square or Fisher's exact tests (when at least one of the expected cell counts was < 5), including odds ratios were performed to determine relationships between AP completion and each of the other variables identified as relevant to a

SUD diagnosis by the panel of experts or those retained by the researcher. For this study, the variables were classified as either dependent (response or outcome) or independent (explanatory or predictor). The dependent variable was AP completion. The independent variables were divided into the three domains of the BPS model (biological, psychological, and sociological). The biological variables considered in this study were family history of SUD, chronic medical conditions with prescribed controlled substances, age at referral to AP, gender, and phentermine use. The psychological variables were prior treatment for SUD, type of treatment (inpatient and outpatient), specific SUD diagnosis, primary reason for substance use identified as pain management, mental health diagnosis, months of abuse, and history of mental, physical, or sexual abuse. The sociological variables were home life stress, work stress, drug of choice category, return to work, and intravenous (IV) drug use. The relationship between AP completion and each of the biopsychosocial variables were investigated using Pearson product-moment correlation coefficient for the independent variables that were continuous and polychoric correlations for the remaining independent variables. To determine the strength of the relationship between variables the correlation coefficients were classified as small ($r = .10$ to .29), medium ($r = .30$ to .49), and large ($r = .50$ to 1.0), following Cohen's suggestions as described by Pallant(2016). Logistic regression was performed to determine predictive factors associated with AP completion. The variable selection for the predictive model was based on expert opinion and statistical significance.

Results

Table 5 displays the demographic characteristics of the participants. Approximately 81% of participants were female with 42.4% ($n = 98$) completing the AP. The participants who earned an associate degree in nursing were the largest group that did not complete the AP (58.5%, $n =$

93). Registered nurses accounted for 246 (86.3%) of the total participants; of these 88.1% ($n =$ 111) completed the AP and 84.9% ($n = 135$) did not complete. The largest category for years of nursing practice was 0-5 years with 32.5% ($n = 35$) who completed and 35.8% ($n = 58$) who did not complete. The 30-39 age group had the greatest number of participants who did not complete (39.6%, $n = 63$).

Table 5

Sample Demographics (*N* = 285)

Characteristic	Complete AP (*n* = 126)		Did Not Complete AP (*n* = 159)		Total Sample	
	n	*%*	*n*	*%*	*n*	*%*
Gender						
Male	28	22.2	26	16.4	54	18.9
Female	98	77.8	133	83.6	231	81.1
Race						
White	107	84.9	142	89.3	249	87.4
Black	7	5.6	10	6.3	17	6.0
Biracial	4	3.1	2	1.3	6	2.1
Hispanic/Latino	1	0.8	4	2.5	5	1.7
Asian	3	2.4	0	0.0	3	1.1
Native American	3	2.4	0	0.0	3	1.1
Other	1	0.8	1	0.6	2	0.7
Highest Education						
Diploma-LPN	5	3.9	21	13.2	26	9.1
Bachelors (Nursing)	35	27.8	35	22.0	70	24.6
Diploma-RN	4	3.2	7	4.4	11	3.9
Associate (Nursing)	69	54.8	93	58.5	162	56.8
Masters	13	10.3	3	1.9	16	5.6
License Type						
LPN	5	4	21	13.2	26	9.1
RN	111	88.1	135	84.9	246	86.3
CRNA	6	4.8	1	0.6	7	2.5
NP	4	3.2	2	1.3	6	2.1
Years in Nursing[a]						
0-5	41	32.5	57	35.8	98	34.4
6-10	35	27.8	48	30.2	83	29.1
11-15	21	16.7	19	11.9	40	14.0
16-20	12	9.5	14	8.8	26	9.1
≥21	17	13.5	21	13.2	38	13.3
Age Group[b]						
20-29	23	18.3	29	18.3	52	18.2
30-39	52	41.3	63	39.6	115	40.4
40-49	38	30.1	39	24.5	77	27.0
≥50	13	10.3	28	17.6	41	14.4

Note. LPN = Licensed Practical Nurse; RN = Registered Nurse; CRNA = Certified Registered Nurse Anesthetist; NP = Nurse Practitioner.
[a]*M*: 10.4 years (*SD* = 8.57, IQR = 10.36, range 0-40 years).
[b]*M*: 38.4 years (*SD* = 9.22, IQR = 14.29, range 23-64 years).

Table 6 presents the results of the correlations between AP completion and each domain of the BPS model. Among the variables within the biological domain, only two that correlated with AP status were statistically significant. There was a large positive correlation between AP completion and phentermine use, $r = .54$, $n = 285$, $p < .001$, with frequency of AP completion associated with the frequency of phentermine use. There was a small positive correlation between AP completion and having received prescriptions for controlled substances while in the AP, $r = .20$, $n = 285$, $p = .04$, with the frequency of AP completion associated with the frequency of prescribed controlled substances while in the AP.

Table 6

Pearson Correlations: AP Status and
Biopsychosocial Domains (N = 285)

Variable	r
Biological	
Family History of SUD	0.11
Chronic Med. Cond. w/ C/S	0.03
Age at Referral to AP	-0.05
Gender	-0.13
Phentermine Use	0.54**
Rx for C/S in the AP	0.20*
Psychological	
Prior SUD Treatment	0.21*
Inpatient Treatment	0.17
Opiate SUD Dx	-0.05
Alcohol SUD Dx	0.03
Illicit SUD Dx	-0.23
Polysubstance SUD Dx	0.22
Benzodiazepine SUD Dx	-0.14
Amphetamine SUD Dx	-0.32
Hypnotic/Sedatives SUD Dx	0.17
Other SUD Dx	-0.94
Pain	-0.02
Co-Occurring MH Dx	-0.15
History of Physical, Mental, or Sexual Abuse	0.04
Sociological	
Number of Months of Abuse	0.03
Home Life Stress	-0.17
Work Stress	-0.01
Opioid DOC	0.04
Alcohol DOC	0.09
Sedatives DOC	0.02
Illicit DOC	-0.12
Other DOC	-0.43*
Return to Work in the AP	0.94**
Intravenous Drug Use	0.08

Note. AP = Alternative Program; SUD = Substance use disorder; Med. Con. w/ C/S= Medical condition with controlled substance; Dx = diagnosis; MH = mental health; DOC = drug of choice.
*p<.05. **p<.001*

Among the variables within the psychological domain, only one variable that was correlated with AP status was statistically significant. There was a small positive correlation between AP completion and prior SUD treatment, $r = .21$, $n = 285$, $p = .04$, with the frequency of individuals who completed the AP associated with the frequency of having previous SUD treatment prior to enrolling in the AP.

Within the sociological domain, two variables that correlated with AP status were statistically significant. There was a large positive correlation between AP completion and returning to work while in the AP, $r = .94$, $n = 285$, $p < .001$, with the frequency of individuals who completed the AP associated with the frequency of returning to nursing practice while in the AP. There was a medium negative correlation between AP completion and other drug of choice (amphetamines, antihistamines, polysubstance, methamphetamines), $r = -.43$, $n = 285$, $p < .02$, with the frequency of AP completion associated with the frequency of the other drugs of choice variable. On the other hand, the correlation between AP completion and the variables inpatient treatment, illicit SUD diagnosis, polysubstance SUD diagnosis, and home life stress could be considered as marginally significant (greater than but close to the statistical significance of this study).

Table 7 consists of the crosstabs (or contingency tables) between the AP status and the BPS characteristics significant, or marginally significant, correlated with that status. Phentermine use was reported by 24 participants in which 83.3% ($n = 20$) completed the AP. Forty-four (53.7%) of participants who completed the AP ($n = 126$) reported obtaining legitimately prescribed controlled substances. Previous treatment for SUD prior to entering the AP was reported by 57 participants, of which 56.1% ($n = 32$) completed the AP. Of the 155 participants who returned to work as a licensed nurse, 78% ($n = 121$) completed the AP.

Four of the nine variables examined were statistically significant for the AP completion: phentermine use, prescriptions for controlled substances while in AP, prior SUD treatment before entering AP, and returning to nursing practice [work]. Phentermine use was significantly associated with completion of the AP (x^2 = 16.26, df = 1, p <.001). Obtaining legitimately prescribed controlled substances while in the AP was statistically significant for AP completion (x^2 = 4.17, df = 1, p =.04). Prior treatment for SUD prior to entering the AP was statistically significant for AP completion (x^2 = 4.11, df = 1, p =.04). Returning to work as a licensed nurse while in the AP was also statistically significant for AP completion (x^2 = 157.9, df = 1, p <.001). There was no statistical significance between AP completion and inpatient treatment (p = .09), illicit drug SUD diagnosis (p = .05), polysubstance SUD diagnosis (p = .09), home life stress (p = .07), and the other category for drug of choice (p = .08).

Table 7

Characteristics of Participants (Complete and Did not Complete)

Characteristic	Complete (N = 126) n (%)	Did Not Complete (N = 159) n (%)	$\chi^2(1)$	Odds Ratio (95% CI)
Phentermine Use			16.26‡	7.31(2.4,22)
Yes	20 (83.3)	4 (16.7)		
No	106 (40.6)	155 (59.4)		
Prescription for C/S in AP			4.17†	1.71(1.0,2.9)
Yes	44(53.7)	38(46.3)		
No	82(40.4)	121(59.6)		
Prior Treatment SUD			4.11†	1.82(1.0,3.3)
Yes	32(56.1)	25(43.9)		
No	94(41.2)	134(58.8)		
Inpatient Treatment			2.76	1.59(0.9,2.7)
Yes	36(52.9)	32(47.1)		
No	90(41.5)	127(58.5)		
Illicit SUD Dx			3.61	0.49(0.2,1.0)
Yes	11(29.7)	26(70.3)		
No	115(46.4)	133(53.6)		
Polysubstance SUD Dx			2.77	2.01(0.9,4.7)
Yes	15(60)	10(40)		
No	111(43)	149(57)		
Home life stress			3.37	0.64(0.4,1.0)
Yes	64(40)	98(60)		
No	62(50)	61(50)		
DOC-other			.08*	0.15(.02,1.2)
Yes	1(11)	8(89)		
No	125(45)	151(55)		
Return to Work			157.90‡	89(33.7,235)
Yes	121(78)	34(22)		
No	5(4)	125(96)		

Note. CI = confidence interval; C/S = controlled substance; AP = Alternative Program; SUD = substance use disorder; Dx = diagnosis; DOC = drug of choice.

*Fisher's Exact Test

†p<.05. ‡p<.001

To determine which variables were predictive of AP completion, a stepwise logistic regression analysis was conducted among the following variables: phentermine use, prescriptions for controlled substances in the AP, prior SUD treatment, inpatient treatment, polysubstance SUD, illicit SUD, return to work, home life stress and drug of choice-other using SAS (Version 9.4). Table 8 presents the only two independent variables that made a unique and statistically significant contribution to the predictive model (phentermine use and return to work). The strongest predictor of AP completion was returning to work (nursing practice) while in the AP. The Hosmer and Lemeshow Goodness of Fit Test ($\chi^2 = 1.14$, 2, $p = .57$) result supports that the model adequately fits the data.

Table 8

Logistic Regression Predicting AP Completion

Predictor	*B*	*SE*	Wald	*df*	*p*	Odds Ratio (95% CI)
Phentermine Use	1.31	.45	8.36	1	.003	13.8(2.3,81.8)
Return to Work	2.32	.27	72.20	1	<.001	104.1(35.7,304.0)

Note. CI = confidence interval; AP = Alternative Program.

Table 9 consists of the crosstabs (or contingency tables) between the AP status and mental health diagnosis and chronic pain. Neither of these variables were statistically significant; however, 226 (79%) of the total sample who reported having a mental health diagnosis and over half of the total sample (58%, $n = 131$) did not complete the AP. Chronic pain was reported by 81 (28.4%) of the total participant sample. Of these 81 participants, a slightly higher number did not complete the AP (54.3%, $n = 44$) as compared to those who did complete (45.7%, $n = 37$).

Table 9

Characteristics of Participants (Complete and Did not Complete)

Characteristic	Complete (N = 126) n (%)	Did Not Complete (N = 159) n (%)	$\chi^2(1)$	Odds Ratio (95% CI)
Mental Health Diagnosis			2.09	1.53(0.86,2.71)
Yes	95(42)	131(58)		
No	31(52.5)	28(47.5)		
Chronic Pain			0.1	0.92(0.55,1.54)
Yes	37(45.7)	44(54.3)		
No	89(43.6)	115(56.4)		

Note. CI = confidence interval.

Discussion

Understanding the biopsychosocial characteristics of nurses diagnosed with a SUD and the variables associated with completion of an ATD program is vital to meeting the regulatory mandate of public protection. Each state board of nursing must structure their ATD program based on legal authority in their jurisdiction (Russell, 2020). The wide variations in legal authority among states to administer and regulate ATD programs makes comparison of ATD programs and the outcomes of such programs between states a difficult task.

Most nurses in this study were female registered nurses which is consistent with the demographics of licensed nurses in North Carolina (NCBON, 2021). However, while males accounted for 19% of the study sample only 9% of the nursing workforce in North Carolina are men (NCBON, 2021). Males being overrepresented in reports of ATD programs is consistently identified in the literature (Clark and Farnworth, 2006; McNelis et al., 2021; Mumba et al., 2019a) and should be further investigated to gain more insight into this phenomenon. A focus could be the differences between practice settings for males and females to determine if males tend to gravitate towards areas with high acuity patients.

The NCBON AP is not a total abstinence program, as nurses are permitted to obtain legitimately prescribed controlled substances. The nurse must inform their provider of the specific SUD diagnosis, drug of choice, and participation with the NCBON AP. If there is a pattern of obtaining multiple controlled substances or prescriptions for the substance of choice, a nurse may be required to be evaluated by an addictionologist (NCBON, 2020).

The association between phentermine use and AP completion in this study was an unexpected finding. Phentermine is typically prescribed for with weight loss (Ahmed et al., 2017) and is generally prescribed for a period of up to 12 weeks (Rueda et al., 2013). In this sample, phentermine use was not associated with a history of gastric bypass surgery (GBS). Of the 20 participants who reported a history of GBS only 2 reported that they were using phentermine, however several ($n = 11$) admitted to marijuana use and alcohol use beginning prior to age 19 ($n = 13$). The literature suggests a link between GBS and alcohol use disorder (AUD; Backman et al., 2016; Ivezaj et al., 2014; King et al., 2017; Saules et al., 2010; Wiedmann et al., 2013). King et al. (2017) identified post-GBS, specifically Roux-en-Y, increased the risk of AUD and abuse of illicit substances with a four-time risk of entering SUD treatment over the seven years post-surgery. Additionally, King et al. (2017) identified psychiatric treatment prior to GBS was a strong predictor of future SUD treatment episodes.

There are shared characteristics between SUD and obesity such as poor impulse control, emotionally driven behaviors, and maladaptive coping skills which would suggest similarities in the neurobiology of the two disorders (Hardy et al. 2018, Volkow et al., 2016). Additional research is needed regarding phentermine use and GBS in the context of a SUD diagnosis in the nursing population. The statistical significance of phentermine use in this sample as a predictor of AP completion was a surprising finding that requires further exploration in other studies.

The association between continued use of legitimately prescribed controlled substances and AP completion in this study was statistically significant although the continued use of controlled substances as occurred in this sample is contrary to recommendations in the literature about abstinence and improved quality of life in individuals with a SUD (Vederhus et al., 2016).

According to the National Institute on Drug Abuse (n.d.) relapse is a return to substance use after attempting to refrain from use and is a common occurrence in the recovery journey for individuals. Mumba et al. (2019b) reported that nurses in an ATD program on average relapsed within 62 months of starting treatment. This finding suggests that nurses can have extended periods of sobriety and that the phenomenon of relapse needs further exploration in this population.

Returning to work was a statistically significant predictor of AP completion. Barriers faced by nurses when returning to the workforce are documented in the literature. Matthias-Anderson and Yurkovich (2016) reported barriers to returning to work such as stigma, difficulty changing behaviors that led to SUD, inability to change self-image persistent collegial SUD knowledge deficits, financial difficulties, and lengthy wait times for decisions by nursing boards regarding licensure or program participation. Carter et al. (2019) identified personal barriers (shame, stigma, or fear of relapse), professional barriers (punitive licensure actions and employment barriers), and practice barriers (work culture, lack of education, and support by colleagues) faced by nurses re-entering the workforce. Additionally, Cares et al. (2015) found that individuals were denied employment due to employers being unwilling to work with nurses in a drug monitoring program because of the perceived impact of increased workload on co-workers. While returning to work is positively associated with ATD program completion, returning to nursing practice too soon after a diagnosis of SUD can have detrimental impacts on

the recovery journey (Crowley & Morgan, 2014). However, there are potential nursing employment opportunities that could be considered low-risk for a nurse in recovery such as settings with no controlled substances or strict employment structures in place to restrict the access of controlled substances.

As identified in the logistic regression model both phentermine use ([OR = 13.8; 95% CI 2.3, 81.8] p <.001) and returning to working while in AP ([OR = 104.1; 95% CI 35.7, 304.0] p < .001) had wide confidence intervals. The wide confidence intervals for these variables suggests reduced precision in estimation of effect. A consideration for future studies would be to include a larger sample with additional demographics such as geographic region, marital status, income, and family status to further explore the characteristics associated with nurses who are prescribed phentermine while in the AP or other drug monitoring programs.

Limitations

The primary limitation of this study was the use of a preexisting data set. Follow-up with AP participants to clarify data or ask additional questions was not possible. Many items in the data set relied on self-report. Nurses who enter an AP may not be completely truthful regarding substance use for fear of the impact on returning to nursing practice or the risk of legal consequences. These findings are limited to nurses in the NCBON AP and may not be generalizable to other nurses participating in another state board of nursing program.

A larger sample analyzing these same data points could validate these results or provide additional predictive variables. The logistic regression model in this study included only nine variables. Additional variables may yield a more robust prediction model.

Conclusions

Nurses who care for patients in an impaired state due to a SUD contribute to patient care deficiencies and poor quality of nursing care. In addition, ensuring the biopsychosocial health of nurses with an SUD, and mitigating risks to the professional image of nursing due to nurses with an untreated SUD who care for patients while impaired is of paramount interest to nursing. In this study, returning to nursing practice was identified as a statistically significant predictor of AP completion and could be a critical aspect of maintaining sobriety. Retaining qualified nurses with a SUD in the workforce while being monitored in an ATD program can have lasting benefits for nurses in their recovery journey. Contrary to what is widely believed, appropriately managed controlled substance prescribing by providers may not negatively impact the recovery process for a nurse in an ATD program as was supported in this study. Providers should follow nationally vetted controlled substance prescribing guidelines, continue to monitor for signs of abuse, conduct random drug screens, and review the prescription monitoring program database prior to prescribing. Nurses are valuable contributors to the healthcare system. Returning to nursing practice while being monitored in an ATD is an important predictor of recovery in nurses with a SUD. A state board of nursing's mission to ensure public protection can ensure this protection through ATD programs that improve recovery and quality of life for nurses seeking treatment for SUD.

REFERENCES

Agrawal, A., & Lynskey, M. T. (2008). Are there genetic influences on addiction: Evidence from family, adoption and twin studies. *Addiction, 103*(7), 1069-1081. http://doi.org/bh7hs3

Agterberg, S., Schubert, N., Overington, L., & Corace, K. (2020). Treatment barriers among individuals with co-occurring substance use and mental health problems: Examining gender differences. *Journal of Substance Abuse Treatment, 112*, 29-35. http://doi.org/ggq26j

Ahmed, R., Marte, E., Ghanim, H., Chaudhuri, A., & Dandona, P. (2017). Effect of phentermine on weight loss in the obese in an active clinical practice. *Endocrine Practice, 23*, 129.

Álvarez, A. S., Pagani, M., & Meucci, P. (2012). The clinical application of the biopsychosocial model in mental health: A research critique. *American Journal of Physical Medicine & Rehabilitation, 91*(13 Suppl 1), S173-S180. http://doi.org/fzdvgr.

American Addictions Centers. (2019). *Co-occurring & dual diagnosis treatment guide*. https://americanaddictioncenters.org/co-occurring-disorders

American Nurses Association (ANA). (2015). *Code of Ethics for Nurses, with Interpretive Statements*. Silver Spring, MD: American Nurses Association, Nursebooks.org, publishers. https://www.nursingworld.org/coe-view-only

American Psychiatric Association (APA). (2012). *Position statement on substance use disorders.* https://www.psychiatry.org/home/policy-finder?g=38290bf9-33a9-4137-b0c6-572d040aae92&Page=5

American Society of Addition Medicine (ASAM). (2020). *Resources: What is the ASAM criteria?* https://www.asam.org/resources/the-asam-criteria/about

Angres, D. H., Bettinardi-Angres, K., & Cross, W. (2010). Nurses with chemical dependency: Promoting successful treatment and reentry. *Journal of Nursing Regulation, 1*(1), 16-20. http://doi.org/dv47

Backman, O., Stockeld, D., Rasmussen, F., Näslund, E., & Marsk, R. (2016). Alcohol and substance abuse, depression and suicide attempts after Roux-en-Y gastric bypass surgery. *British Journal of Surgery, 103*(10), 1336-1342. https://doi.org/f3sf2c

Baldisseri, M. R. (2007). Impaired healthcare professional. *Critical Care Medicine, 35*(2 Suppl), S106-S116. http://doi.org/fsqhvf

Bazazan, A., Dianat, I., Bahrampour, S., Talebian, A., Zandi, H., Sharafkhaneh, A., & Maleki-Ghahfarokhi, A. (2019). Association of musculoskeletal disorders and workload with work schedule and job satisfaction among emergency nurses. *International Emergency Nursing, 44*, 8-13. http://doi.org/dwgx

Bell, D. M., McDonough, J. P., Ellison, J. S., & Fitzhugh, E. C. (1999). Controlled drug misuse by certified registered nurse anesthetist. *AANA Journal, 67*(2), 133–140.

Berge, K. H., Dillon, K. R., Sikkink, K. M., Taylor, T. K., & Lanier, W. L. (2012). Diversion of drugs within health care facilities, a multiple-victim crime: Patterns of diversion, scope, consequences, detection, and prevention. *Mayo Clinic Proceedings, 87*(7), 674-682. http://doi.org/f36nhq

Bettinardi-Angres, K., & Angres, D. H. (2010). Understanding the disease of addiction. *Journal of Nursing Regulation, 1*(2), 31-37. http://doi.org/dv48

Bettinardi-Angres, K., & Bologeorges, S. (2011). Addressing chemically dependent colleagues. *Journal of Nursing Regulation, 2*(2), 10-17. http://doi.org/dv49

Bettinardi-Angres, K., Pickett, J., & Patrick, D. (2012). Substance use disorders and accessing

alternative-to-discipline programs. *Journal of Nursing Regulation, 3*(2), 16-23.

    http://doi.org/dv5b

Bevilacqua, L., & Goldman, D. (2009). Genes and addictions. *Clinical Pharmacology &*

    Therapeutics, 85(4), 359-361. http://doi.org/b3nvkh

Bierut, L. J., Dinwiddie, S. H., Begleiter, H., Crowe, R. R., Hesselbrock, V., Nurnberger, J. I.,

    Porjesz, B., Schuckit, M.A. & Reich, T. (1998). Familial transmission of substance

    dependence: Alcohol, marijuana, cocaine, and habitual smoking: A report from the

    collaborative study on the genetics of alcoholism. *Archives of General*

    Psychiatry, 55(11), 982-988. http://doi.org/bjqhg3

Birtel, M. D., Wood, L., & Kempa, N. J. (2017). Stigma and social support in substance abuse:

    Implications for mental health and well-being. *Psychiatry Research, 252*, 1-8.

    http://doi.org/gbh59z

Blumenthal, D., Gokhale, M., Campbell, E. G., & Weissman, J. S. (2001). Preparedness for

    clinical practice: Reports of graduating residents at academic health

    centers. *JAMA, 286*(9), 1027-1034. http://doi.org/bkggwz

Booth, J.V., Grossman, D., Moore, J., Lineberger, C., Reynolds, J.D., Reves, J.G., & Sheffield,

    D. (2002). Substance abuse among physicians: A survey of academic anesthesiology

    programs. *Anesthesia & Analgesia, 95*(4), 1024-1030. https://doi.org/fsc2km

Borrell-Carrio, F., Suchman, A., & Epstein, R. (2004). The biopsychosocial model 25 years

    later: Principles, practice and scientific inquiry. *Annals of Family Medicine, 2*(6), 576-

    582. https://doi.org/b85fq7

Bowen, M. K., Taylor, K. P., Marcus-Aiyeku, U., & Krause-Parello, C. A. (2012). An

    examination of stress, coping, and adaptation in nurses in a recovery and monitoring

program. *Journal of Addictions Nursing, 23*(3), 159-166.

http://doi.org/dv6d

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.

Brown, J. G., Trinkoff, A., & Smith, L. (2003). Nurses in recovery: The burden of life problems

and confidence to resist relapse. *Journal of Addictions Nursing, 14*(3), 133-137.

http://doi.org/dp46hs

Brummond, P.W., Chen, D.F., Churchill, W.W., Clark, J.S., Dillon, K.R., Dumitru, D.,

Eschenbacher, L., Fera, T., Fortier, C.R., Gullickson, K.K., Jurakovich, K., Kent, S.,

Keonavong, J., Marchese, C., Meyer, T., Murdaugh, L.B., Ogden, R.K., O'Neal, B.C.,

Rough, S., Saenz, R. & Smith, J.S (2017). ASHP guidelines on preventing diversion of

controlled substances. *American Journal of Health-System Pharmacy, 74*(5), 325-348.

http://doi.org/dv6f

Bryson, E. O., & Silverstein, J. H. (2008). Addiction and substance abuse in

anesthesiology. *Anesthesiology, 109*(5), 905-917. http://doi.org/bth6kw

Buchman, D. Z., Leece, P., & Orkin, A. (2017). The epidemic as stigma: The bioethics of

opioids. *The Journal of Law, Medicine & Ethics, 45*(4), 607-620.

http://doi.org/dv6g

Buckner, J. D., Heimberg, R. G., Ecker, A. H., & Vinci, C. (2013). A biopsychosocial model of

social anxiety and substance use. *Depression and Anxiety, 30*(3), 276-284.

http://doi.org/f4p84h

Cadiz, D. M., O'Neill, C., Schroeder, S., & Gelatt, V. (2015). Online education for nurse

supervisors managing nurses enrolled in alternative-to-discipline programs. *Journal of*

Nursing Regulation, 6(1), 25-32. http://doi.org/dv6h

Cares, A., Pace, E., Denious, J., & Crane, L. A. (2015). Substance use and mental illness among

    nurses: Workplace warning signs and barriers to seeking assistance. *Substance*

    Abuse, 36(1), 59-66. http://doi.org/dv6j

Carey, K. B., Purnine, D. M., Maisto, S. A., Carey, M. P., & Simons, J. S. (2000). *Treating*

    substance abuse in the context of severe and persistent mental illness: Clinicians'

    perspectives. United States: Elsevier Inc. https://doi.org/b2wwdz

Carter, T., McMullan, S. P., & Patrician, P. A. (2019). Barriers to reentry into nurse anesthesia

    practice following substance use disorder treatment: A concept analysis. *Workplace*

    Health & Safety, 67(4), 189-199. https://doi.org/gfzq5g

Cataldo, I., Azhari, A., Coppola, A., Bornstein, M. H., & Esposito, G. (2019). The influences of

    drug abuse on mother-infant interaction through the lens of the biopsychosocial model of

    health and illness: A review. *Frontiers in Public Health, 7*, 45.

    http://doi.org/dv6k

Center for Behavioral Health Statistics and Quality (CBHSQ). (2020). 2019 National Survey on

    Drug Use and Health: Methodological summary and definitions. Rockville, MD:

    Substance Abuse and Mental Health Services Administration.

    https://www.samhsa.gov/data/

Centers for Medicare and Medicaid Services (CMS). The Center for Consumer Information &

    Insurance Oversight. The Mental Health Parity and Addiction Equity Act. (2014).

    https://www.cms.gov/CCIIO/PROGRAMS-AND-INITIATIVES/OTHER-

    INSURANCE-PROTECTIONS/MHPAEA_FACTSHEET

Chilton, J., Crone, D. M., & Tyson, P. J. (2019). 'The group was the only therapy which

supported my needs, because it helped me feel normal and I was able to speak out with a

voice': A qualitative study of an integrated group treatment for dual diagnosis service

users within a community mental health setting. *International Journal of Mental Health

Nursing.* http://doi.org/dv6m

Chou, C., Robb, J. L., Clay, M. C., & Chronister, J. A. (2013). Social support as a mediator

between internalized stigma and coping behaviors of individuals with substance abuse

issues. *Rehabilitation Research, Policy, and Education, 27*(2), 104-107.

http://doi.org/dv6n

Citizen Advocacy Center (CAC). (2019). *Mission*. https://www.citizenadvocacycenter.org/

Clark, C., & Farnsworth, J. (2006). Program for recovering nurses: An evaluation. *Medsurg

Nursing, 15*(4), 223.

Clark, L., & Goudriaan, A. E. (2018). The neuroscience and neuropsychology of gambling and

gambling addiction: An introduction to the special issue. *International Gambling

Studies, 18*(2), 173-177. http://doi.org/dv6p

Cloud, W., & Granfield, R. (2008). Conceptualizing recovery capital: Expansion of a theoretical

construct. *Substance Use & Misuse, 43*(12-13), 1971-1986.

http://doi.org/dzdrk2

Cook, L.M. (2013). Can nurses trust nurses in recovery reentering the workplace? *Nursing,

43*(3), 21-24. http://doi.org/dv6q

Comín, M., Braquehais, M. D., Valero, S., Bel, M. J., Navarro, M. C., Díaz, A., Nasillo, V.,

Padrós, J., Bruguera, E., & Casas, M. (2014). Inpatient physicians and nurses with dual

diagnosis: An exploratory study. *Journal of Dual Diagnosis, 10*(3), 156-161.

https://doi.org/10.1080/15504263.2014.933031

Crowley, K., 1955, Morgan, C., 1957, & Sigma Theta Tau International. (2014). *Re-entry: A guide for nurses dealing with substance use disorder*. Sigma Theta Tau International.

Dahlhamer, J., Lucas, J., Zelaya, C., Nahin, R., Mackey, S., DeBar, L., Kerns, R., Von Korff, M., Porter, L., & Helmick C. (2018). Prevalence of chronic pain and high impact chronic pain among adults – United States, 2016. *MMWR*. https://www.cdc.gov/mmwr/volumes/67/wr/mm6736a2.htm?s_cid=mm6736a2_w.

Darbro, N. (2005). Alternative diversion programs for nurses with impaired practice: Completers and non-completers. *Journal of Addictions Nursing, 16*, 169–185. http://doi.org/dh2dhf.

Darbro, N. (2011). Model guidelines for alternative programs and discipline monitoring programs. *Journal of Nursing Regulation, 2*(1), 42-49. http://doi.org/dv6s

Darbro, N., & Malliarakis, K. D. (2012). Substance abuse: Risk factors and protective factors. *Journal of Nursing Regulation, 3*(1), 44–48. http://doi.org/dv6t

Davenport, S., Weaver, A., & Caverly, M. (2019). *Economic impact on non-medical opioid use in the United States.* https://www.soa.org/globalassets/assets/files/resources/research-report/2019/econ-impact-non-medical-opioid-use.pdf

Davidson, J. E., Proudfoot, J., Lee, K., Terterian, G., & Zisook, S. (2020a). A longitudinal analysis of nurse suicide in the United States (2005–2016) with recommendations for action. *Worldviews on Evidence-Based Nursing, 17*(1), 6-15. http://doi.org/dv6v

Davidson, J. E., Ye, G., Deskins, F., Rizzo, H., Moutier, C., & Zisook, S. (2020b). Exploring nurse suicide by firearms: A mixed-method longitudinal (2003-2017) analysis of death investigations. *Nursing Forum,* 1-9. https://doi.org/fqh6

Davis, K., Powers, C., Vuk, J., & Kennedy, R. (2014). Predictors of substance use recidivism

among Arkansas nurses. *Journal of Nursing Regulation, 5*(2), 39-44.

https://doi.org/10.1016/S2155-8256(15)30075-2

Dittman, P. W. (2012). Mountains to climb: Male nurses and their perspective on professional

impairment. *International Journal of Human Caring, 16*(1), 34-41. http://doi.org/dv6w

Domino, K. B., Hornbein, T. F., Polissar, N. L., Renner, G., Johnson, J., Alberti, S., & Hankes,

L. (2005). Risk factors for relapse in health care professionals with substance use

disorders. *JAMA, 293*(12), 1453-1460. http://doi.org/cx3xqq

Dowell, D., Arias, E., Kochanek, K., Anderson, R., Guy, G. P., Losby, J. L., & Baldwin, G.

(2017). Contribution of opioid-involved poisoning to the change in life expectancy in the

United States, 2000-2015. *JAMA, 318*(11), 1065-1067. http://doi.org/dv6x

Dunn, D. (2005). Substance abuse among nurses--defining the issue. *AORN Journal, 82*(4), 573.

Eisenmann, N. (2020). *Differences between licensed healthcare professionals with substance

use-related licensure discipline.*

Emergency Nurses Association (ENA) & International Nurses Society on Addictions

(IntNSA). (2017). Joint position statement: Substance use among nurses and nursing

students. *Journal of Emergency Nursing, 43*(3), 259-263. http://doi.org/dv6z

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science,

196*(4286), 129-136. http://doi.org/dhmdsk

Engel, G. L. (1979). The biopsychosocial model and the education of health professionals.

General Hospital Psychiatry, 1(2), 156-165. http://doi.org/c8pxb2

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of

Psychiatry, 137*(5), 535-544. http://doi.org/gffn3q

Epstein, R. M. (2014). Realizing Engel's biopsychosocial vision: resilience, compassion, and

quality of care. *International Journal of Psychiatry in Medicine, 47*, 275-287.

http://doi.org/f596w5

Ervin, S. M. (2015). *The lived experience of registered nurses with substance use disorder who*

complete an alternative to discipline program through a state board of nursing

Franklin, G. M., Mercier, M., Mai, J., Tuman, D., Fulton-Kehoe, D., Wickizer, T., & Sears, J. M.

(2019). Brief report: Population-based reversal of the adverse impact of opioids on

disability in Washington state workers' compensation. *American Journal of Industrial*

Medicine, 62(2), 168-174. https://doi.org/fqh7

Freimann, T., Pääsuke, M., & Merisalu, E. (2016). Work-related psychosocial factors and mental

health problems associated with musculoskeletal pain in nurses: A cross-sectional

study. *Pain Research and Management, 2016*, 1-7. http://doi.org/dwhp

Fogger, S. A., & McGuinness, T. (2009). Alabama's nurse monitoring programs: The nurse's

experience of being monitored. *Journal of Addictions Nursing, 20*(3), 142-149.

http://doi.org/dfbfgs

Foli, K. J., Reddick, B., Zhang, L., & Krcelich, K. (2020). Substance use in registered nurses: "I

heard about a nurse who . . .". *Journal of the American Psychiatric Nurses*

Association, 26(1), 65-76. http://doi.org/dv62

Ghaferi, H. A., Bond, C., & Matheson, C. (2016). Does the biopsychosocial-spiritual

model of addiction apply in an Islamic context? A qualitative study of Jordanian addicts

in treatment. *Drug and Alcohol Dependence, 172*, 14-20.

http://doi.org/f9xg6k

Giacometti, L., & Barker, J. (2020). Sex differences in the glutamate system: Implications for

addiction. *Neuroscience and Biobehavioral Reviews, 113*, 157-168.

doi:10.1016/j.neubiorev.2020.03.010

Green, A. I., Drake, R. E., Brunette, M. F., & Noordsy, D. L. (2007). Schizophrenia and co-

occurring substance use disorder. *American Journal of Psychiatry, 164*(3), 402-408.

https://doi.org/fqh8

Griffith, J. (1999). Substance abuse disorders in nurses. *Nursing Forum, 34*(4), 19-28.

http://doi.org/cqw2vz

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial framework.

Journal of Substance Use, 10(4), 191-197. http://doi.org/b7jmhm

Gropelli, T. M., & Corle, K. (2010). Nurses' and therapists' experiences with occupational

musculoskeletal injuries. *AAOHN Journal, 58*(4), 159-166. http://doi.org/bd42q6

Haack, M. R., & Yocom, C. J. (2002). State policies and nurses with substance use

disorders. *Journal of Nursing Scholarship, 34*(1), 89-94. http://doi.org/ddg8gs

Hamza, H. & Bryson, E. O. (2011). Exposure of anesthesia providers in

recovery from substance abuse to potential triggering agents. *Journal of Clinical

Anesthesia, 23*(7), 552-557. http://doi.org/bg5bvq

Han, Benjamin H., MD, MPH, & Moore, Alison A., MD, MPH. (2017;2018;). Prevention and

screening of unhealthy substance use by older adults. *Clinics in Geriatric Medicine,

34*(1), 117-129. https://doi.org/10.1016/j.cger.2017.08.005

Hardy, R., Fani, N., Jovanovic, T., & Michopoulos, V. (2018). Food addiction and substance

addiction in women: Common clinical characteristics. *Appetite, 120*, 367-373.

https://doi.org/fxdh

Hawkins, D., Roelofs, C., Laing, J., & Davis, L. (2019). Opioid-related overdose deaths by

industry and occupation—Massachusetts, 2011-2015. *American Journal of Industrial Medicine, 62*(10), 815-825. https://doi.org/fqh9

Heath A. C., Bucholz K. K., Madden P. A., Dinwiddie S. H., Slutske W. S., Bierut L. J., Statham, D.J., Dunne, M.P., Whitfield, J.B., & Martin, N.G. (1997). Genetic and environmental contributions to alcohol dependence risk in a national twin sample: consistency of findings in women and men. *Psychological Medicine 27*(6), 1381–96. http://doi.org/fvxxnr

Hedegaard, H., Miniño, A.M., Warner, M. (2018). *NCHS Data Brief: Drug overdose deaths in the United States from 1999-2017*. https://www.cdc.gov/nchs/data/databriefs/db329-h.pdf

Heise, B. (2003). The historical context of addiction in the nursing profession: 1850-1982. *Journal of Addictions Nursing, 14*(3), 117-124. http://doi.org/ffcrg9

Horton-Deutsch, S., McNelis, A., & Day, P. (2011). Enhancing mutual accountability to promote quality, safety, and nurses' recovery from substance use disorders. *Archives of Psychiatric Nursing, 25*(6), 445-455. http://doi.org/b2phrq

Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression, third edition* (3rd ed.). Hoboken, NJ: John Wiley and Sons. http://doi.org/dv63

Hunter, S. B., Watkins, K. E., Wenzel, S., Gilmore, J., Sheehe, J., & Griffin, B. (2005). Training substance abuse treatment staff to care for co-occurring disorders. *Journal of Substance Abuse Treatment, 28*(3), 239-245. http://doi.org/c5ddbh

Hyman, S. E., & Malenka, R. C. (2001). Addiction and the brain: The neurobiology of compulsion and its persistence. *Nature Reviews. Neuroscience, 2*(10), 695-703. https://doi.org/cnc6qr

Ivezaj, V., Saules, K. K., & Schuh, L. M. (2014). New-onset substance use disorder after gastric

    bypass surgery: Rates and associated characteristics. *Obesity Surgery, 24*(11), 1975-1980.

    https://doi.org/f6ms4j

John, W. S., & Wu, L. (2020). Chronic non-cancer pain among adults with substance use

    disorders: Prevalence, characteristics, and association with opioid overdose and

    healthcare utilization. *Drug and Alcohol Dependence, 209*, 107902-107902.

    https://doi.org/10.1016/j.drugalcdep.2020.107902

Jiang, R., Lee, I., Lee, T. A., & Pickard, A. S. (2017). The societal cost of heroin use disorder in

    the United States. *PloS One, 12*(5), e0177323. http://doi.org/f98wzv

Ke, Y., Feng, I., Hsu, C., Wang, J., Su, S., Huang, C., & Lin, H. (2018). Nurses have a four-fold

    risk for overdose of sedatives, hypnotics, and antipsychotics than other healthcare

    providers in Taiwan. *PloS One, 13*(8), e0202004. doi:10.1371/journal.pone.0202004

Kelly, T. M., & Daley, D. C. (2013). Integrated treatment of substance use and psychiatric

    disorders. *Social Work in Public Health, 28*(3-4), 388-406.

    http://doi.org/dv64

Kenna, G. A., & Lewis, D. C. (2008). Risk factors for alcohol and other drug use by healthcare

    professionals. *Substance Abuse Treatment, Prevention, and Policy, 3*(1), 3-3.

    http://doi.org/c2htkj

Kenna, G. A., & Wood, M. D. (2005). Family history of alcohol and drug use in healthcare

    professionals. *Journal of Substance use, 10*(4), 225-238.

    http://doi.org/cpxh82

King, W. C., Chen, J., Courcoulas, Anita P., Dakin, G. F., Engel, S. G., Flum, David R.,

Hinojosa, M. W., Kalarchian, M. A.,Mattar, S. G., Mitchell, J. E., Pomp, A., Pories, W.

    J., Steffen, Kristine J., White, G. E., Wolfe, B. M., & Yanovski, S. Z. (2017). Alcohol

    and other substance use after bariatric surgery: Prospective evidence from a U.S.

    multicenter cohort study. *Surgery for Obesity and Related Diseases, 13*(8), 1392-1402.

    https://doi.org/gfxszf

Koob, G. F. & Volkow, N. D. (2016). Neurobiology of addiction: A neurocircuitry

    analysis. *Lancet Psychiatry, the, 3*(8), 760-773. http://doi.org/f84gq2

Kunyk, D. (2015). Substance use disorders among registered nurses: Prevalence, risk, and

    perceptions in a disciplinary jurisdiction. *Journal of Nursing Management, 23*(1), 54-64.

    http://doi.org/ggvgkx

Kunyk, D., Milner, M., & Overend, A. (2016). Disciplining virtue: Investigating the discourses

    of opioid addiction in nursing. *Nursing Inquiry, 23*(4), 315-326. http://doi.org/f9fwcj

Levy, S. (2020). State-funded drug rehabilitation programs: How to find govern-funded

    treatment. https://addictionresource.com/drug-rehab/state-funded/

Leyton, M., & Vezina, P. (2014). Dopamine ups and downs in vulnerability to addictions: A

    neurodevelopmental model. *Trends in Pharmacological Sciences (Regular Ed.), 35*(6),

    268-276. https://doi.org/fqjb

Lindsay, E. (2016). The high cost of drug diversion.

    https://www.pharmacytimes.com/contributor/erica-lindsay-pharmd-mba-jd/2016/01/the-

    high-cost-of-drug-diversion

Lipscomb, J., Trinkoff, A., Brady, B., & Geiger-Brown, J. (2004). Health care system changes

    and reported musculoskeletal disorders among registered nurses. *American Journal of*

    Public Health, 94(8), 1431-1435. http://doi.org/c9jgzt

Lillibridge, J., Cox, M., & Cross, W. (2002). Uncovering the secret: Giving voice to the

    experiences of nurses who misuse substances. *Journal of Advanced Nursing, 39*(3), 219-

    229. http://doi.org/cmf9p8

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology, 27*(1),

    363-385. http://doi.org/cr3rb3

López-Pelayo, H., Aubin, H., Drummond, C., Dom, G., Pascual, F., Rehm, J., . . . Gual, A.

    (2020). "The post-COVID era": Challenges in the treatment of substance use disorder

    (SUD) after the pandemic. *BMC Medicine, 18*(1), 1-8. https://doi.org/gg6vrv

Mackridge, A., & Rowe, P. (2018). *A practical approach to using statistics in health research:*

    from planning to reporting. Hoboken, NJ: Wiley.

Maher-Brisen, P. (2007). Addiction: An occupational hazard in nursing. *AJN, American Journal*

    of Nursing, 107(8), 78-79. http://doi.org/d4j4px

Malliarakis, K. D., Smith, V., & Darbro, N. (2012). Regulatory management of substance use in

    high-risk nurse populations. *Journal of Nursing Regulation, 2*(4), 32-39.

    http://doi.org/dv65

Martin, B., Reneau, K., & Jarosz, L. (2018). Patient safety culture and barriers to adverse event

    reporting: A national survey of nurse executives. *Journal of Nursing Regulation, 9*(2), 9-

    17. doi:10.1016/S2155-8256(18)30113-3

Massaly, N., Morón, J. A., & Al-Hasani, R. (2016). A trigger for opioid misuse: Chronic pain

    and stress dysregulate the mesolimbic pathway and kappa opioid system. *Frontiers in*

    Neuroscience, 10, 480. http://doi.org/dv66

Matthews, S., Dwyer, R., & Snoek, A. (2017). Stigma and self-stigma in addiction. *Journal of*

    Bioethical Inquiry, 14(2), 275-286. http://doi.org/dv67

Matthias-Anderson, D., & Yurkovich, E. (2016). Work reentry for RNs after substance use

    disorder treatment: Implications for the nursing profession. *Journal of Nursing*

    Regulation, 7(3), 26-32. http://doi.org/dv68

McLellan, A. T., Skipper, G. S., Campbell, M., & DuPont, R. L. (2008). Five-year outcomes in a

    cohort study of physicians treated for substance use disorders in the united

    states. *BMJ, 337*(nov04 1), a2038-a2038. https://doi.org/drw3bq

McNelis, A. M., Horton-Deutsch, S., O'Haver Day, P., Gavardinas, T., Outlaw, C., Palmer, R., &

    Schroeder, M. (2012). Indiana state nurses assistance program: Identifying gender

    differences in substance use disorders. *Perspectives in Psychiatric Care, 48*(1), 41-46.

    http://doi.org/bpw3tq

Merikangas, K.R., Stolar, M., Stevens, D.E., Goulet, J., Preisig, M.A., Fenton, B., Zhang, H.,

    O'Malley, S.S. & Rounsaville, B.J. (1998). Familial transmission of substance use

    disorders. *Archives of General Psychiatry, 55*(11), 973-979. http://doi.org/cj3zr9

Merlo, L. J., Cummings, S. M., & Cottler, L. B. (2014). Prescription drug diversion among

    substance-impaired pharmacists: Pharmacist diversion. *The American Journal on*

    Addictions, 23(2), 123-128. http://doi.org/dv69

Miela, R., Cubała, W. J., Mazurkiewicz, D. W., & Jakuszkowiak-Wojten, K. (2018). The

    neurobiology of addiction. A vulnerability/resilience perspective. *The European Journal*

    of Psychiatry, 32(3), 139-148. http://doi.org/gfp3hh

Monroe, T., & Kenaga, H. (2011). Don't ask don't tell: Substance abuse and addiction among

    nurses. *Journal of Clinical Nursing, 20*(3-4), 504. http://doi.org/ft83rt

Monroe, T. B., Kenaga, H., Dietrich, M. S., Carter, M. A. & Cowan, R. L. (2013). The

    Prevalence of Employed Nurses Identified or Enrolled in Substance Use Monitoring

Programs. *Nursing Research*, *62*(1), 10–15. http://doi.org/f4hc8q

Monroe, T., Pearson, F., & Kenaga, H. (2008). Procedures for handling cases of substance abuse among nurses: A comparison of disciplinary and alternative programs. *Journal of Addictions Nursing, 19*(3), 156-161. http://doi.org/c2jskv

Morrow, J. D., & Flagel, S. B. (2016). Neuroscience of resilience and vulnerability for addiction medicine: From genes to behavior. *Progress in Brain Research, 223*, 3. https://doi.org/fqjc

Mueser, K. T., Drake, R. E., & Wallach, M. A. (1998). Dual diagnosis: A review of etiological theories. *Addictive Behaviors, 23*(6), 717-734. doi:10.1016/S0306-4603(98)00073-2

Mumba, M. N. (2018). Employment implications of nurses going through peer assistance programs for substance use disorders. *Archives of Psychiatric Nursing, 32*(4), 561-567. http://doi.org/gd3m5s

Mumba, M. N., & Kraemer, K. R. (2019). Substance use disorders among nurses in medical-surgical, long-term care, and outpatient services. *MedSurg Nursing, 28*(2), 87-118.

Mumba, M. N., Baxley, S. M., Snow, D. E., & Cipher, D. J. (2019a). A retrospective descriptive study of nurses with substance use disorders in Texas. *Journal of Addictions Nursing, 30*(2), 78-86. http://doi.org/ggvgcp

Mumba, M. N., Baxley, S. M., Cipher, D. J., & Snow, D. E. (2019b). Personal factors as correlates and predictors of relapse in nurses with impaired practice. *Journal of Addictions Nursing, 30*(1), 24-31. https://doi.org/10.1097/JAN.0000000000000262

Naegle, M. A. (2003). An overview of the American Nurses' Association's action on impaired practice with suggestions for future directions. *Journal of Addictions Nursing, 14*(3), 145-147. http://doi.org/b3zjm2

National Alliance on Mental Illness (NAMI). (2017). *Dual diagnosis*.

    https://www.nami.org/learn-more/mental-health-conditions/related-conditions/dual-

    diagnosis

National Council State Board of Nursing (NCSBN). (2020a). *Alternative to Discipline*

    Programs for Substance Use Disorder. https://www.ncsbn.org/alternative-to-

    discipline.htm

National Council State Boards of Nursing (NCSBN). (2020b). *Nursing Regulation*.

    https://www.ncsbn.org/boards.htm

National Council State Boards of Nursing (NCSBN). (2011). *Substance use disorder in*

    nursing: *A resource manual and guidelines for alternative and disciplinary monitoring*

    programs. Chicago, Illinois.

National Council State Boards of Nursing (NCBSN). (2021). The national nursing database.

    https://www.ncsbn.org/national-nursing-database.htm

National Institute on Drug Abuse (NIDA). (2020). *Drugs, brains, and behavior: The science*

    of addiction. https://www.drugabuse.gov/publications/drugs-brains-

    behavior-science-addiction/treatment-recovery

National Institute on Drug Abuse (NIDA). (2019). *North Carolina opioid summary*.

    https://www.drugabuse.gov/opioid-summaries-by-state/north-carolina-opioid-summary

National Institute on Drug Abuse (NIDA). (2018). *Understanding drug use and addiction*.

    https://www.drugabuse.gov/publications/drugfacts/understanding-drug-use-addiction

National Institute of Neurological Disorders and Stroke. (2019). Chronic pain.

    https://www.ninds.nih.gov/Disorders/All-Disorders/Chronic-Pain-Information-Page

National Institute on Drug Abuse. (n.d.). What is a relapse?

https://easyread.drugabuse.gov/sites/default/files/node_pdf/61-what-is-a-relapse.pdf

New, K. (2014). Preventing, detecting, and investigating drug diversion in health care

    facilities. *Journal of Nursing Regulation, 5*(1), 18-25. doi:10.1016/S2155-

    8256(15)30095-8

North Carolina Board of Nursing (NCBON). (2020). *Drug monitoring programs:*

    Alternative Program (AP). https://www.ncbon.com/discipline-compliance-drug-

    monitoring-forms-alternative-program-ap

North Carolina Board of Nursing (NCBON). (2021). *Licensure statistics*.

    https://www.ncbon.com/news-publications-statistics-statistics-statistics-by-nursing-

    designation

North Carolina Controlled Substance Reporting System Act (NC CSRS Act). (2017).

    https://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_90/Article

    _5.html

North Carolina Department of Health and Human Services (NC DHHS). (2021). North Carolina

    Emergency Department (ED) Visits for Opioid Overdose: January 2021.

    https://injuryfreenc.ncdhhs.gov/DataSurveillance/StatewideOverdoseSurveillanceReports

    /OpioidOverdoseEDVisitsMonthlyReports/StatewideOpioidOverdoseSurveillanceED-

    Data-Jan2021.pdf

North Carolina Department of Health and Human Services (NC DHHS). (n.d.-a). Grants.

    https://www.ncdhhs.gov/divisions/mhddsas/grants

North Carolina Department of Health and Human Services (NC DHHS). (n.d.-b). *N.C. Opioid*

    Action Plan Data Dashboard. https://www.ncdhhs.gov/about/department-

    initiatives/opioid-epidemic/opioid-action-plan-data-dashboard

North Carolina Office of the Governor. (2019). *Governor Cooper Signs the Opioid Response act and other bills into law.* https://governor.nc.gov/news/governor-cooper-signs-opioid-response-act-and-other-bills-law

North Carolina Office of the Governor. (2017). *Strengthen Opioid Misuse Prevention (STOP) Act.* https://governor.nc.gov/news/stop-act-provision-takes-effect-jan-1-will-limit-opioid-prescriptions

Nursing Practice Act (NPA). (2019). *State of North Carolina-Nursing Practice Act.* https://www.ncleg.net/enactedlegislation/statutes/html/byarticle/chapter_90/article_9a.html

National Safety Council (2015). *Press release: National Safety Council calls for workplace policies around opioid painkiller use.* https://www.prnewswire.com/newsreleases/national-safety-council-calls-forworkplace-policies-around-opioid-painkiller-use300112150.html

Occupational Health and Safety Administration (OHSA). (n.d.). *Safe patient handling.* https://www.osha.gov/SLTC/healthcarefacilities/safepatienthandling.html

Office of Disease Prevention and Health Promotion. (2020). *Healthy People 2020.* https://www.healthypeople.gov/

Oreskovich, M.R., Kaups, K.L., Balch, C.M., Hanks, J.B., Satele, D., Sloan, J., Meredith, C., Buhl, A., Dyrbye, L.N. & Shanafelt, T.D. (2012). Prevalence of alcohol use disorders among American surgeons. *Archives of Surgery, 147*(2), 168-174. http://doi.org/gfzq2j

Pace, E. M., Kesterson, C., Garcia, K., Denious, J., Finnell, D. S., & Bayless, S. D. (2020). Experiences and outcomes of nurses referred to a peer health assistance program: Recommendations for nursing management. *Journal of Nursing Management, 28*(1), 35-

42. http://doi.org/dv7b

Pagé, M. G., Saïdi, H., Ware, M. A., & Choinière, M. (2016). Risk of opioid abuse and

biopsychosocial characteristics associated with this risk among chronic pain patients

attending a multidisciplinary pain treatment facility. *The Clinical Journal of Pain, 32*(10),

859-869. http://doi.org/f855b6

Pallant, J. (2016). *SPSS survival manual: A step by step guide to data analysis using IBM*

SPSS (6th ed.). Maidenhead, Berkshire, England: McGraw-Hill Education.

Persolja, M., Marin, M., Caporale, L., Odasmini, B., Scarsini, S., Fiorella, V., Lucia, P., &

Palese, A. (2020). Chief nurse executives involuntary turnover in times of health care

reforms: Findings from an interpretative phenomenology study. *Health Services*

Management Research. 33(4):172-185. https://doi.org/fqjd

Pettersen, H., Landheim, A., Skeie, I., Biong, S., Brodahl, M., Benson, V., & Davidson, L.

(2018). Why do those with long-term substance use disorders stop abusing substances? A

qualitative study. *Substance Abuse: Research and Treatment, 12*, 1178221817752678.

http://doi.org/gdpdxs

Pilgrim, J. L., Dorward, R., & Drummer, O. H. (2017). Drug-caused deaths in Australian

medical practitioners and health-care professionals. *Addiction, 112*(3), 486-493.

http://doi.org/dv7c

Polit, D. F. & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for*

nursing practice (10th ed.). Wolters Kluwer. ISBN 978-1496300232

Privette, K. G., Kiefer, S. A., & Burhans, L. D. (2015). Using an external review to promote

transparency of an alternative program for chemical dependency. *Journal of Nursing*

Regulation, 5(4), 11-16. http://doi.org/dv7d

Probst, C., Manthey, J., Martinez, A., & Rehm, J. (2015). Alcohol use disorder severity and

    reported reasons not to seek treatment: A cross-sectional study in European primary care

    practices. *Substance Abuse Treatment, Prevention and Policy, 10*(1), 32-32.

    https://doi.org/fqjf

Protenus Diversion Digest (PDD). (2020). 2020 Drug diversion digest.

    https://www.protenus.com/resources/2020-drug-diversion-digest/

Przekop, P., Przekop, A., Haviland, M. G., & Oda, K. (2018). Comprehensive treatment for

    patients with chronic pain in a 12-step based substance use disorder program. *Journal of*

    Bodywork and Movement Therapies, 22(3), 685-692.

    https://doi.org/10.1016/j.jbmt.2017.08.009

Rojas, J., Brand, M., Fareed, S., & Koos, E. (2013). Psychiatric comorbidity in health care

    professionals with substance use disorders. *Addictive Disorders & their Treatment, 12*(2),

    51-57. http://doi.org/dv7f

Rosen, D., Warner, L. A., & Tolman, R. M. (2006). Comparing psychiatric service use among

    low-income women and women in a general household population. *Social Work*

    Research, 30(4), 223-232. http://doi.org/fzw98x

Ross, C. A., Jakubec, S. L., Berry, N. S., & Smye, V. (2018). "A two glass of wine shift":

    Dominant discourses and the social organization of nurses' substance use. *Global*

    Qualitative Nursing Research, 5. http://doi.org/ggbg7h

Ross, S., & Peselow, E. (2012). Co-occurring psychotic and addictive disorders: Neurobiology

    and diagnosis. *Clinical Neuropharmacology, 35*(5), 235-243.

    http://doi.org/f383j4

Rueda-Clausen, C. F., Padwal, R. S., & Sharma, A. M. (2013). New pharmacological approaches

for obesity management. *Nature Reviews. Endocrinology, 9*(8), 467-478.

https://doi.org/10.1038/nrendo.2013.113

Rummans, T. A., Burton, M. C., & Dawson, N. L. (2018). How good intentions contributed to

bad outcomes: The opioid crisis. *Mayo Clinic Proceedings, 93*(3), 344-

350. http://doi.org/gc5xjc

Russell, K. A. (2017). Nurse practice acts guide and govern: Update 2017. *Journal of Nursing*

Regulation, 8(3), 18-25. doi:10.1016/S2155-8256(17)30156-4

Russell, K. (2020). Components of nurse substance use disorder monitoring programs. *Journal of*

Nursing Regulation, 11(2), 20-27. https://doi.org/fs2m

Samenow, C. P. (2010). A biopsychosocial model of hypersexual Disorder/Sexual

addiction. *Sexual Addiction & Compulsivity, 17*(2), 69-81. http://doi.org/chjrrz

Samuelson, S. T. & Bryson, E. O. (2017). The impaired anesthesiologist: What you should know

about substance abuse. *Canadian Journal of Anesthesia/Journal Canadien*

d'Anesthésie, 64(2), 219-235. http://doi.org/f9msw4

Saules, K. K., Wiedemann, A., Ivezaj, V., Hopper, J. A., Foster-Hartsfield, J., & Schwarz, D.

(2010). Bariatric surgery history among substance abuse treatment patients: Prevalence

and associated features. *Surgery for Obesity and Related Diseases, 6*(6), 615-621.

https://doi.org/cvhsht

Savych, B., Neumark, D., & Lea, R. (2019). Do opioids help injured workers recover and get

back to work? The impact of opioid prescriptions on duration of temporary disability.

Industrial Relations (Berkeley), 58(4), 549-590. https://doi.org/fqjg

Schaefer, M. K., & Perz, J. F. (2014). Outbreaks of infections associated with drug diversion by

US health care personnel. *Mayo Clinic Proceedings, 89*(7), 878.

Schiller E.Y. & Mechanic, O.J. (2019).   *Opioid Overdose*. [Updated 2019 Mar 2]. In: StatPearls

[Internet]. StatPearls Publishing. Available from:

https://www.ncbi.nlm.nih.gov/books/NBK470415/

Schluter, P. J., Turner, C., & Benefer, C. (2012). Long working hours and alcohol risk among

Australian and New Zealand nurses and midwives: A cross-sectional study. *International

Journal of Nursing Studies, 49*(6), 701-709. http://doi.org/f4cmxk

Shaw, M. F., McGovern, M. P., Angres, D. H., & Rawal, P. (2004). Physicians and nurses with

substance use disorders. *Journal of Advanced Nursing, 47*(5), 561-571.

http://doi.org/dpvq6p

Shaw, W. S., Roelofs, C., & Punnett, L. (2020). Work environment factors and prevention of

opioid-related deaths. *American Journal of Public Health*, *110*(8), 1235-1241.

doi:10.2105/AJPH.2020305716

Skewes, M. & Gonzalez, V. (2013). *The biopsychosocial model of addiction. Principles of

Addiction.*

https://is.muni.cz/el/1423/jaro2018/PSY109/um/68207459/Biopsychosocial_Model_of_A

ddiction_Miller_P__2013__Principles_of_Addiction.pdf

Skipper, G. E., Campbell, M. D., & Dupont, R. L. (2009). Anesthesiologists with substance use

disorders: A 5-year outcome study from 16 state physician health programs. *Anesthesia

and Analgesia, 109*(3), 891-896. http://doi.org/bss66k

Smiley, R., & Reneau, K. (2020). Outcomes of substance use disorder monitoring programs for

nurses. *Journal of Nursing Regulation, 11*(2), 28-35. https://doi.org/fqjj

Soylar, P., & Ozer, A. (2018). Evaluation of the prevalence of musculoskeletal disorders in

nurses: A systematic review. *Medicine Science International Medical Journal, 7*(3), 1-85.

http://doi.org/dwg3

St. Marie, B. (2014). Health care experiences when pain and substance use disorder coexist:

"Just because I'm an addict doesn't mean I don't have pain". *Pain Medicine*, *15*(12),

2075-2086. https://doi.org/10.1111/pme.12493

St. Marie, B. (2016). The experiences of advanced practice nurses caring for patients with

substance use disorder and chronic pain. *Pain Management Nursing, 17*(5), 311-321.

https://doi.org/10.1016/j.pmn.2016.06.001

Squires, A., & Dorsen, C. (2018). Qualitative research in nursing and health professions

regulation. *Journal of Nursing Regulation, 9*(3), 15-26. http://doi.org/dv7g

Substance Abuse and Mental Health Services Administration (SAMHSA). (2016). *Impact of

the DSM-IV to DSM-5 Changes on the National Survey on Drug Use and Health

[Internet]. Substance Abuse and Mental Health Services Administration (US). Executive

Summary.* https://www.ncbi.nlm.nih.gov/books/NBK519700/

Substance Abuse and Mental Health Services Administration. (2020a). *Key substance use and

mental health indicators in the United States: Results from the 2019 National Survey on

Drug Use and Health* (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55).

Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse

and Mental Health Services Administration. https://www.samhsa.gov/data/

Substance Abuse and Mental Health Services Administration Center for Substance Abuse

Prevention (SAMHSA). (2018). *Medical review officer guidance manual for federal

workplace drug testing programs.*

https://www.samhsa.gov/sites/default/files/workplace/mro_guidance_manual_508_final_march_2018.pdf

Substance Abuse and Mental Health Services Administration (SAMHSA). (2020b). *Mental health and substance use disorders*. https://www.samhsa.gov/find-help/disorders

Substance Abuse and Mental Health Services Administration: The Opioid Crisis and the Black/African American Population: An Urgent Issue. (2020c). Publication No. PEP20-05-02-001. Office of Behavioral Health Equity. Substance Abuse and Mental Health Services Administration.

Tabachnick, B. G., 1936, & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Pearson/Allyn & Bacon.

Timko, C., Dixon, K., & Moos, R. H. (2005). Treatment for dual diagnosis patients in the psychiatric and substance abuse systems. *Mental Health Services Research, 7*(4), 229-242. http://doi.org/d9p9q2

Tipton, P. H. (2005). *Predictors of relapse for nurses participating in a peer assistance program*

Torrens, M., Gilchrist, G., Domingo-Salvany, A., & psyCoBarcelona Group. (2010). Psychiatric comorbidity in illicit drug users: Substance-induced versus independent disorders. *Drug and Alcohol Dependence, 113*(2), 147-156. https://doi.org/dpvxjj

Treede, R., Rief, W., Barke, A., Aziz, Q., Bennett, M. I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N. B., First, M. B., Giamberardino, M. A., Kaasa, S., Korwisi, B., Kosek, E., Lavand'homme, P., Nicholas, M., Perrot, S., Scholz, J., Schug, S., . . . Wang, S. (2019). Chronic pain as a symptom or a disease: The IASP classification of chronic pain for the international classification of diseases (ICD-11). *Pain (Amsterdam), 160*(1), 19-27. https://doi.org/10.1097/j.pain.0000000000001384

Trinkoff, A. M., Zhou, Q., Storr, C. L., & Soeken, K. L. (2000). Workplace access, negative

    prescriptions, job strain, and substance use in registered nurses. *Nursing Research, 49*(2),

    83-90. http://doi.org/fpfc5t

Tsui, J. I., Lira, M. C., Cheng, D. M., Winter, M. R., Alford, D. P., Liebschutz, J. M., Edwards,

    R. R., & Samet, J. H. (2016). Chronic pain, craving, and illicit opioid use among patients

    receiving opioid agonist therapy. *Drug and Alcohol Dependence, 166*, 26-31.

    https://doi.org/10.1016/j.drugalcdep.2016.06.024

United States Bureau of Labor Statistics (U.S. BLS). (2018). *Occupational injuries and*

    illnesses among registered nurses.

    https://www.bls.gov/opub/mlr/2018/article/occupational-injuries-and-illnesses-among-

    registered-nurses.htm

United States Department of Health and Human Services (U.S. DHHS). (2017). *Strategy to*

    combat opioid abuse, misuse, and overdose: A framework based on the five-point

    strategy. https://www.hhs.gov/opioids/sites/default/files/2018-09/opioid-fivepoint-

    strategy-20180917-508compliant.pdf

United States Department of Health and Human Services. National Institutes of Health. (2020).

    What does it mean to have a genetic predisposition to a disease?

    https://ghr.nlm.nih.gov/primer/mutationsanddisorders/predisposition

United States Department of Health and Human Services (HHS), Office of the Surgeon General,

    Facing Addiction in America: The Surgeon General's Spotlight on Opioids. Washington,

    DC: HHS, September 2018.

    https://www.addiction.surgeongeneral.gov/sites/default/files/Spotlight-on-

    Opioids_09192018.pdf

United States Department of Health and Human Services (U.S. DHHS). (2019). Pain

 Management Best Practices Inter-Agency Task Force Report: Updates, Gaps,

 Inconsistencies, and Recommendations. https://www.hhs.gov/ash/advisory-

 committees/pain/reports/index.html

United States Substance Abuse and Mental Health Services Administration, & United States.

 Public Health Service. Office of the Surgeon General. (2016). *Facing addiction in*

 America: The surgeon general's report on alcohol, drugs and health. U.S. Department of

 Health and Human Services, Office of the Surgeon General.

 https://addiction.surgeongeneral.gov/index.php/executive-summary/report

United States Department of Justice. Drug Enforcement Agency (U.S. DOJ DEA). *Diversion*

 Control Center. (2016). Title 21 United States Code (USC) Controlled Substance Act.

 https://www.deadiversion.usdoj.gov/21cfr/21usc/

United States Department of Transportation (U.S. DOT). (2018). *Urine specimen collection*

 guidelines.

 https://www.transportation.gov/sites/dot.gov/files/docs/resources/partners/drug-and-

 alcohol-testing/2567/urine-specimen-collection-guidelines-january-2018.pdf

Valdes, J. A. (2014). The concept of reentry in the addicted anesthesia provider. *AANA*

 Journal, 82(2), 95.

Vayr, F., Herin, F., Jullian, B., Soulat, J. M., & Franchitto, N. (2019). Barriers to seeking help

 for physicians with substance use disorder: A review. *Drug and Alcohol*

 Dependence, 199, 116-121. https://doi.org/gghnpq

Vederhus, J., Birkeland, B., & Clausen, T. (2016). Perceived quality of life, 6 months after

 detoxification: Is abstinence a modifying factor? *Quality of Life Research, 25*(9), 2315-

2322. https://doi.org/10.1007/s11136-016-1272-z

Versalles, L. (2019). *Pre-employment drug screening*.

https://www.accesalabs.com/blog/pre-employment-drug-screening/

Vink, J. M. (2016). *Genetics of addiction: Future focus on gene × environment interaction?*.

United States: http://doi.org/f8z745

Volkow, N. D., Koob, G. F., & McLellan, A. T. (2016). Neurobiologic advances from the brain

disease model of addiction. *The New England Journal of Medicine, 374*(4), 363-371.

http://doi.org/gcwbv4

von Bertanlanffy, L. (1972). The history and status of general systems theory. *The Academy of

Management Journal, 15*(4), 407-426. http://www.perflensburg.se/Bertalanffy.pdf

Weiss, P., Potter, J., Griffin, M., McHugh, R., Haller, D., Jacobs, P., Gardin, J., Fischer, D., &

Rosen, K. (2014). Reasons for opioid use among patients with dependence on

prescription opioids: The role of chronic pain. *Journal of Substance Abuse Treatment,

47*(2), 140-145. https://doi.org/10.1016/j.jsat.2014.03.004

White, W.L. (2007). Addiction recovery: Its definition and conceptual boundaries. *Journal of

Substance Abuse Treatment, 33*(3), 229-241. http://doi.org/drz49k

Wiedemann, A. A., Saules, K. K., & Ivezaj, V. (2013). Emergence of new onset substance use

disorders among post-weight loss surgery patients. *Clinical Obesity, 3*(6), 194-201.

https://doi.org/fxdf

Wiss, D. A. (2019). A biopsychosocial overview of the opioid crisis: Considering nutrition and

gastrointestinal health. *Frontiers in Public Health, 7*, 193. http://doi.org/dv7h

World Health Organization (WHO). (2002). *Towards a common language for functioning,*

disability and health. *World Health Organization.*

https://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1

Worley, J. (2017). Nurses with substance use disorders: Where we are and what needs to be

done. *Journal of Psychosocial Nursing and Mental Health Services, 55*(12), 11-14.

http://doi.org/gcpvqx

Wright, E. L., McGuiness, T., Moneyham, L. D., Schumacher, J. E., Zwerling, A., &

Stullenbarger, N. E. (2012). Opioid abuse among nurse anesthetists and

anesthesiologists. *AANA Journal, 80*(2), 120-8. Retrieved from

https://search.proquest.com/docview/1022709637?accountid=10639

Zhang, H., Tan, L., Hao, W., & Deng, Q. (2017). Evaluation of a community-based integrated

heroin addiction treatment model in Chinese patients. *Oncotarget, 8*(33), 54046.

http://doi.org/gd3zhz

APPENDIX A: UNIVERSITY AND MEDICAL CENTER INSTITUTIONAL REVIEW BOARD APPROVAL

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** ·
www.ecu.edu/ORIC/irb

Not Human Subject Research Certification

From: Social/Behavioral IRB
To: Sara Griffith
CC:
Pamela Reis
Date: 6/28/2019
Re: UMCIRB 19-001393
Social/Behavioral IRB

On 6/28/19, the IRB Staff reviewed your proposed research and determined that it does not meet the federal definitions of research involving human participants, as applied by East Carolina University.

Therefore, it is with this determination that you may proceed with your research activity and no further action will be required. However, if you should want to modify your research activity, you must submit notification to the IRB before amending or altering this research activity to ensure that the proposed changes do not require additional UMCIRB review.

The UMCIRB appreciates your dedication to the ethical conduct of research. It is your responsibility to ensure that this research is being conducted in accordance with University policies and procedures, the ethical principles set forth in the Belmont Report, and the ethical standards of your profession. If you have questions or require additional information, please feel free to contact the UMCIRB office at 252-744-2914.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

APPENDIX B: LETTER FROM NCBON APPROVING UTILIZATION OF DATA SET

Frank DeMarco, MSN, RN, NEA-BC
Chair
Yolanda VanRiel, PhD, RN-BC, OCN, CNE, ANEF
Vice-Chair
Julia L. George, RN, MSN, FRE
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June 19, 2019

East Carolina University
Office of Research Integrity & Compliance
Brody Medical Services Building, 4N-64
600 Moye Boulevard
Greenville, NC 27834

Re: Alternative Program for Chemical Dependency UMCIRB 19-001393

Dear University and Medical Center Institutional Review Board:

Sara A. Griffith, PhD Student with the College of Nursing at East Carolina
University, has permission to access and use pre-existing dataset. The dataset
consists of participants from the North Carolina Board of Nursing's Alternative
Program for Chemical Dependency during the timeframe 2011 to 2014.

Sincerely,

Julia L. George

Julia L. George, RN, MSN, FRE
Chief Executive Officer
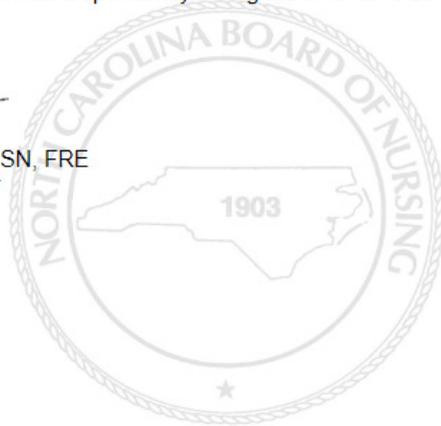
Serving the Public through Regulatory Excellence

APPENDIX C: NCBON ADDICTIONOLOGIST INSTRUCTIONS

The North Carolina Board of Nursing Alternative Program, Chemical Dependency Discipline Program, Intervention Discipline Sanction and Probationary License Sanction require an evaluation by a Board approved Addictionologist. Please provide a typed report and recommendations using the following Addictionologist Evaluation form. Please return the typed evaluation results to:

Regulatory Compliance Coordinator
North Carolina Board of Nursing
P.O. Box 2129
Raleigh, North Carolina 27602-2129

ADDICTIONOLOGIST EVALUATION FORM

A. Substance Use Disorder with severity or Diagnosis (AXIS I - V)

B. Acute Dimension Criteria 1-6

    1. Acute intoxication and /or withdrawal:

    2. Biomedical conditions and complications:

    3. Emotional/Behavioral:

    4. Treatment acceptance/resistance:

    5. Relapse potential:

    6. Recovery environment:

C. Past and present substance use, physical, psychosocial, and mental health history

D. Verification of your review for the last 12 months of the NC Controlled Substance Report Summary (CSRS)

E. Current medications (prescribed and OTC)

F. If on controlled substances, do you recommend an evaluation by a pain management physician?

G. Ability to safely and competently practice nursing to include:

- Mental status
- Cognitive functioning

- Sound judgment
- Problem solving ability
- Ability to cope with stressful situations
- Decision making in a crisis

H. Recommendations for level of treatment, if applicable.

I. Need for further evaluations or specific testing

APPENDIX D: BIOPSYCHOSOCIAL VARIABLES

Biological

Variable	Operational Definition	Measurement	Reference
Age Category	Age of nurse at time of entry (signing AP consent) divided into categories	20-29, 30-39, 40-49, >50	Categories of ages
Gender	Gender of each nurse in the AP	Reported gender (male, female)	NCLEX application; self-report
Race	Race of each nurse in the AP	White, Black, other	Race entered by self-report on NCLEX examination (NURSYS system)
Age at referral	Age at time of referral to the AP program	Reported age/birthdate	Birthdate listed in Licensure system
Category of the drug of choice	Drug of choice divided into drug categories based on the commonly known class of the medications	Opioid Narcotic, Alcohol, Sedatives/antianxiety, illicit drugs, poly, antihistamine, amphetamine, other	DEA
Prescription for controlled substances while in the AP	Based on the nurses' mandatory report of receipt of controlled substances while in program	Yes or no	Controlled substance document provider completes; CSRS reports
Phentermine use	Weight loss medication (stimulant)	Yes or no	CSRS, self-report; intake by NCBON staff; treatment records
Family history of substance use disorder	Gathered by treatment provider regarding immediate family members who have substance use disorders (parents, siblings, grandparents, aunts/uncles)	Yes or no	Self-report; treatment records; addictionologist report

Medical condition with a prescribed controlled substance	Reported medical conditions as reported by nurse to treatment provider	Yes or no	Reported by nurse to compliance monitor, treatment provider and addictionologist
AP Status	Status of nurse in the AP	Complete or did not complete	NCBON case file

Psychological

Variable	Operational Definition	Measurement	Reference
Mental health diagnosis	Mental health diagnosis obtained from treatment provider DSM V section	DSM IV or V	Addictionologist evaluation; treatment records
SUD diagnosis	Diagnosis by treatment provider regarding which dependence the nurse has based on the provider assessment (axis I)	Opioid, benzodiazepine, illicit, alcohol, amphetamines, anxiolytic, or Polysubstance	Addictionologist report
Prior SUD treatment	A nurse's prior treatment for SUD prior to AP (no violation of Nursing Practice Act prior)	Yes or no	Self-report, treatment providers, addictionologist
Type of treatment program	Treatment level is determined by treatment facility; nurse must follow the treatment path as it is recommended by the providers	Inpatient or outpatient	Established list of Board approved providers with the recommendation
History physical/mental/ sexual abuse	Sexual, physical, or mental abuse as described by the licensee in his/her past	Yes or no	treatment records; addictionologist report
Family history of substance use disorder	Gathered by treatment provider regarding immediate family members who have substance use disorders (parents, siblings, grandparents, aunts/uncles)	Yes or no	Self-report; treatment records; addictionologist report
Chronic Pain History	Report by nurse related to primary	Pain	Self-report

	reason for use of substance(s) or development of SUD		
Home life stress issues	Reports by nurse of stress at home	Yes or no	Self-report
Work Stress	Reports by nurse of stress at work	Yes or no	Self-report
AP Status	Status of nurse in the AP	Complete or did not complete	NCBON case file

Social Environmental			
Variable	**Operational Definition**	**Measurement**	**Reference**
License type	License type issued at time of entrance into AP	RN, LPN, CRNA, NP (No CNM or CNS in cohort)	Licensure is required by state law and based on educational preparation
Highest education	Highest educational degree reported by nurses	Degree listed which might correspond to level of practice (LPN vs RN vs APRN)	Self-report on renewal application
Years in Nursing Category	Length of years in nursing divided into categories	Date of initial licensure	Licensed date in NCBON internal system
Years in nursing	Years in nursing at the time entering AP	Calculated years based on time of entry into program and initial license	Licensure system
Practice prior to AP	Practice location of the nurse prior to AP and at the time of the complaint	Location of event that led to report of potential violation of NPA	Self-report; complaint; treatment records
Specific hospital location prior to AP	Specific location of the nurse in the hospital setting prior to entering AP	Acute Care, ED, Cardiac, Med/surg, Oncology, OB/L&D, anesthesia/OR/Endo, Psych, non-clinical, Peds, clinic, Float pool, unspecified, N/A, data unknown transferred from another program	Self-report; complaint; treatment records
Shift	Specific shift the nurse was working	Shift assigned to work when reported events occurred (i.e.. 7am to 7pm, 12 hour shifts)	Complaint; self-report
Employment status	Status of employment at the time of complaint being submitted to the NCBON	leave of absence, resigned, Terminated, Unknown	Complaint
How obtained drugs	How controlled substances or other medications were obtained by the nurse	N/A, used/created waste, Wrote/called in Rx (forgery), Rx meds misused, Street, Pulled 2 gave 1, mishandled CS- picked up patient meds	Self-report

		from pharmacy, Took family and friends meds, Dr shopping, substitution, signed out for patient didn't give, 1diverted from supply cabinet, tampered, took symptom relief kit & meds after pts expired, used co-workers code to access meds, sharps container/trash, diverted from patient supply, diverted from IV line, meds being returned to pharmacy, used animal meds, no orders	
How detected	How the nurse was identified by the agency; what prompted a further review or conversation related to nursing practice issues/concerns	audit Pandora /CDAR report w/discrepancies in doc, high user/waste report, patient complaint, impaired on duty, missing meds, DWI, Pharmacist questioned Rx, N/A, left treatment AMA, observed, found in desk/locker/car, arrested, in BR frequent and long time - late wastes, self-reported, Staff concerns, medicating pts not assigned, video tape, random drug test, Family member/other reported, worker's comp prompted review, pulling meds off duty, provider identified multiple meds, multiple pain meds to one patient	Self-report; treatment records; complaint
Method of Use	How the nurse used substances	IV, PO, IM, Combinations of IV, PO or IM, Snorted, Smoked, Subcutaneously	Self-report
Drug of choice Category	Nurse identified substance of abuse-category	Opioid, Alcohol, Sedative, Illicit (i.e. cocaine, marijuana, methamphetamines), Other	Self-report; treatment records; addictionologist report
Months of drug use	Number of months acknowledged by the nurse regarding length of use of the substance(s) of choice	Number of months (numerical value)	Self-report; treatment record; intake document-NCBON staff

Home life stress issues	Reports by nurse of stress at home	Yes or no	Self-report
Work Stress	Reports by nurse of stress at work	Yes or no	Self-report
Return to work	Nurse returned to nursing practice while in the AP	Yes or no	Worksite interview; compliance documentation; work performance report
Days between Enrollment and RTW	Length of time in days from enrollment in the AP until nurse returned to work	Number of days	Compliance documentation: consent date signed and return to work forms
Length of time in the AP (days)	Number of days nurse participated in the AP	Number of days	AP documents
RTW Setting Category	The setting the nurse in the AP returned to work	Hospital, LTC, Dialysis, Office, MH/Treatment, other, N/A	Return to work forms, compliance documentation
AP Status	Status of nurse in the AP	Complete or did not complete	NCBON case file

APPENDIX E: SUBSTANCE USE DISORDER IN NURSING: PREDICTORS FOR

COMPLETION OF ALTERNATIVE PROGRAM SURVEY

I am writing to invite you to participate in a Modified Delphi Survey process to support my research study at East Carolina University (ECU) in Greenville, North Carolina. The title of my doctoral dissertation is A Retrospective Analysis of Characteristics Associated with Completion of the North Carolina Board of Nursing's Alternative Program (AP) for Chemical Dependency. I am analyzing a secondary data set of deidentified data collected at the NCBON from January 2011 to December 2014 and includes nurses who were involved in the Alternative Program for Chemical Dependency. This study has been approved as exempt by the University and Medical Center Institutional Review Board at ECU (UMCIRB 19-001393) since it is secondary research of deidentified data that does not require consent.

The purpose of this Modified Delphi Survey process is to determine variables that would most likely predict program completion (success) in nurses enrolled in the NCBON Alternative Program. Reference to these characteristics appears to be absent in the nursing regulatory literature. To reach consensus on this topic, two to three email survey responses may be required.

The initial survey should take you around 10 to 15 minutes to complete. Your participation in this survey is voluntary and you can withdraw or decline to participate at any point during the process. The Principal Investigator of this study is Sara Griffith and can be contacted griffiths95@students.ecu.edu.

By completing this survey, you are confirming your willingness to participate in this Modified Delphi Survey process.

Based on your expertise, please select the **top 25 variables** in predicting the likelihood of a nurses' completion of an Alternative Program for Chemical Dependency. In order to complete this section of the survey, click on the box next to the variables selected. You may select up to 25 variables.   The items do not have to be ranked in any specific order. All variables will not be used. The goal is to retain 10-15 variables for analysis.

- [ ] License Type (RN, LPN, APRN)
- [ ] Highest Educational Level
- [ ] Age
- [ ] Age at Referral to Alternative Program (AP)
- [ ] Years in Nursing
- [ ] Gender
- [ ] Race
- [ ] Practice Setting Prior to AP
- [ ] Specific Hospital Setting Prior to AP
- [ ] Shift worked Prior to AP
- [ ] Employment Status at Start of AP
- [ ] Prior Treatment for Substance Use Disorder (SUD)
- [ ] Type of Treatment for SUD (ex. inpatient, outpatient)
- [ ] How nurse learned about AP
- [ ] Who referred nurse to AP
- [ ] How nurse obtained controlled substances
- [ ] How nurse was detected
- [ ] Substances of Concern
- [ ] Nurse's Drug of Choice (specific substance)
- [ ] Drug of Choice Category (opioid, illicit, alcohol)
- [ ] How nurse used (ex. intravenous, oral)
- [ ] Initial Use of controlled substances by valid prescription
- [ ] Nurse's Initial Response to NCBON regarding SUD
- [ ] SUD Diagnosis (ex. opioid use disorder)
- [ ] Months of Abuse
- [ ] Age of Initial Alcohol use
- [ ] Nicotine Use
- [ ] Marijuana Use
- [ ] Phentermine Use
- [ ] History of physical, sexual, or mental
- [ ] Family History of SUD

- ☐ Home Life Stress
- ☐ Work Stress
- ☐ Sleep Problems
- ☐ Primary Reason for Use (ex, pain, depression)
- ☐ Primary Reason for SUD
- ☐ Chronic Medical Conditions with use of Controlled Substances
- ☐ Specific Medical Conditions
- ☐ Prescriptions for Controlled Substances while in AP
- ☐ Mental Health Diagnosis
- ☐ Medication Assistive Treatment Use
- ☐ History of Gastric Bypass
- ☐ Criminal Charges
- ☐ Nurse Returned to Work While in AP
- ☐ Days between entering AP and Returning to Work
- ☐ Return to Work Setting (ex. hospital, LTC, dialysis)
- ☐ Substances of concern identified by employer