Decreasing Opioid Prescriptions Through Formal Screening

Submitted by

Joelle Marie Carson

A Direct Practice Improvement Project Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Nursing Practice

Grand Canyon University

Phoenix, Arizona

January 26, 2021

GRAND CANYON UNIVERSITY

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Joelle Marie Carson

has been approved

January 26, 2021

APPROVED:

Linda Price DNP, DPI Project Chairperson

Chris S. Nelson MD, Committee Member

ACCEPTED AND SIGNED:

[redacted]

Lisa G. Smith, PhD, RN, CNE
Dean and Professor, College of Nursing and Health Care Professions

2/19/2021

Date

Abstract

It is known in today's healthcare that opioid abuse is on the rise in the United States. The project site noted aberrant behaviors and the seeking of narcotics from certain clients in the occupational health clinic. The purpose of this quantitative quasi-experimental quality improvement project was to determine if the implementation of Webster's *Opioid Risk Tool* (ORT) would impact the number of opioid prescriptions written for acute pain among patients seen an occupational health clinic in central Indiana over four-weeks. The theoretical frameworks utilized in the project included Skinner's behaviorist theory, Bandura's social cognitive theory, and Orem's self-care deficit theory. The sample population included 46 patients n=22 in the comparative group and n=24 in the implementation group. Data was obtained from the electronic medical record. A chi-square test revealed a statistical and clinically significant decline in opioid prescription rates from the comparative (n =22, 100%) to the implementation group (n= 9, 37.5%), X^2 (1, N=46) = 20.40, p = .000. The results indicated the implementation of Webster's ORT may reduce the number of opioid prescriptions for acute pain patients in the occupational health setting. Recommendations include sustaining the project, disseminate the findings along other settings where acute pain prescriptions are utilized, and future research to include implementation of multiple care modalities in patients with aberrant behavior.

Keywords: Webster's Opioid Risk Tool, ORT, modalities of care, PTSD, stress, and diversion, opioid prescriptions, Skinner's behaviorist theory, opioid addiction, opioid use, chronic pain, acute pain, Bandura's social cognitive theory, Orem's self-care deficit theory.

Dedication

The direct project improvement, Decreasing Opioid Prescriptions Through Formal Screening, is dedicated to the men and women of the military, past and present, who endure the residual effects of selfless service and war.

Acknowledgments

I would like to thank Chris Nelson, MD, who has been a mentor and friend through my doctorate adventure. Dr. Nelson's ability to explain the biochemical physiology in a patient with opioid addiction is what led to the subject of the direct project improvement topic. I would also like to thank Linda Price, DNP, CPNP who did not allow for any substandard work. The continuation of pushing to achieve a higher level than originally thought possible, has led to a project I am proud of. Finally, I would like to thank my husband Bryan, who has been my biggest fan, and never once doubted my ability to complete my doctorate.

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Chapter 1: Introduction to the Project

Opioid abuse is a national healthcare crisis that has effects on all demographics of the general population (Center for Disease Control and Prevention [CDC], 2020). Mismanagement of chronic pain has been shown to lead to severe opioid misuse and be caused by the inappropriate writing of prescriptions for the opioid medication (CDC, 2020). Between the years 2006 to 2012, there was a steady increase in opioid prescriptions written (CDC, 2020). The total number of opioid medication prescriptions in the U.S. peaked in 2012 at 255 million, which was 81 prescriptions per 100 people (CDC, 2020). In 2018, 11% of counties in the United States had enough opioid prescriptions that every person in the assigned county could have received an opioid (CDC, 2020). Through the utilization of screening tools, such as Webster's Opioid Risk Tool (ORT), a patient is evaluated for post-traumatic life events, addictive tendencies, or symptoms of mental illness (Webster, 2005). Not recognizing these issues that can lead to opioid misuse. However, screening has been shown to allow a provider and patient the opportunity to develop a plan of care that supports them mentally and physically without creating opioid dependency (Webster, 2005).

This DPI project aimed to provide education about pain theory, social cognitive therapy, modalities of care, and implement the intervention tool Webster's ORT at an occupational health clinic in central Indiana over four weeks. Through the implementation of Webster's ORT, the expectation was a reduction in the rate of opioid prescriptions as the first-line treatment. Provider and patient education about stress and how it can affect the body provided an opportunity to successfully approach alternative care modalities at the project site. The early identification of individuals with a higher

probability of developing an opioid addiction could prevent long-term physical and psychosocial problems.

Physical and psychological stress, and how a patient perceives it, relates to the amount of adaptational energy the patient must utilize (Slavich et al., 2020). Positive stress and negative stress require the ability to adapt and change to the present circumstances (Slavich et al., 2020). Notably, there are stressors that one can adapt to easily and others that are not. Entrapment stressors include problems with stable housing, and interpersonal relationships (Slavich et al., 2020). The person experiencing extreme stress has a threshold of tolerance. Once the stress level is maximized, the person experiences entrapment (Slavich et al., 2020). The outcome of the response to the stress (effective or harmful) relates to the timing the event occurs in the patient's life. A patient experiencing stress that evokes a fight or flight reaction is benefited by the adrenaline and cortisol surge (Slavich et al., 2020). The patient who cannot resolve the stressor afterward continues to live in constant fear and will exhibit maladaptive behaviors (Slavich et al., 2020). The significance of this maladaptive behavior and how it relates to the improvement project is patients will look for outlets that help in the coping mechanism through chemical escape, leading to the potential of opioid misuse.

In this chapter, the background of the project, including the problem and the purpose it addressed, are discussed. The clinical questions that guided the project are provided. Then, how the project advanced science and its significance are presented. The rationale for the methodology and design are presented prior to a discussion of key terms used in the project. The chapter ends with a discussion of the assumptions, limitations, and delimitations of the project before providing a summary and organization of the remainder of the project.

Background of the Project

Opioid use disorder (OUD) is the intentional misuse of opiate medication or drugs (Ho & Rosenheck, 2018). In one study, 94% of patients examined inpatient had symptomology of post-traumatic stress disorder (PTSD) and misuse of opiates (Schifano, Papanti, Corkery, & Orsolini, 2018). Active PTSD was found in 38.5%, while 51.9% had chronic PTSD (Schifano et al., 2018). The use of alcohol and opioids is a self-destructive, self-prescribed treatment that patients self-administer to help cope with the hypervigilance of PTSD (Schifano et al., 2018). The severity of PTSD correlates with the misuse of opioids alone to the use of opioids with sedatives or opioids and cocaine (Schifano et al., 2018). The research demonstrated that the relationship between acute pain and PTSD suggests that severe psychological stress and pain circuits converge in individuals and can lead to opioid misuse (Schifano et.al., 2018).

Post-traumatic stress disorder is the result of a traumatic event experienced directly by the individual or by the fear of what could happen in stressful circumstances (Bernardy & Montano, 2019). The patient experiences the symptomology of exaggerated startle reflex and hypervigilance (Bernardy & Montano, 2019). The brain processes experience people endure daily. Reliving the memory can convert the mind to a status of hypervigilance (Bernardy & Montano, 2019). The patient with PTSD has increased anxiety during the thought process and remembrance of a traumatic event (Tull, Forbes, Weiss, & Gratz, 2019). Intrusive thoughts, survivors' guilt, and avoidance of activities complete the symptomology of PSTD (Tull, Forbes, Weiss, & Gratz, 2019).

Webster’s ORT has been shown to provide information to healthcare providers regarding the need for mental health, physical therapy, or other modalities that provide collaborative care for the patients in this project (Webster, 2005). Recognizing the risk

factors that can lead to the development of opiate use disorder was the focus of the DPI project. A gap was identified in the literature that reflected that the regular use of a screening tool helps ensure patients are provided medications that will be effective for their chronic pain without the development of OUD (Webster, 2005). Multiple screening tools are present and available for use; however, Webster's ORT was peer-reviewed and validated in multiple articles that reviewed opioid assessment tools (Lawrence, 2017). The questions are asked in a non-intrusive, non-judgmental manner, and the integrated approach opens avenues the provider and patient may not have addressed without the screening questions. By understanding the risk of OUD, the provider can integrate public health nursing and mental health theory to successfully retrain and motivate a patient to deal with the mental stress related to or associated with pain.

Problem Statement

It was not known if or to what degree the implementation of Webster's Opioid Risk Tool would impact the opioid prescription rate among healthcare providers in an occupational health care clinic in central Indiana over four weeks. Research revealed pain is exacerbated by stress and individuals with chronic pain, which causes stress, are at-risk for opioid abuse (Lawrence, 2017). According to the CDC, the general population affected by the opioid crisis has continued to grow (CDC, 2020). Opioid prescriptions are associated with opioid use disorder, and the Surgeon General has the goal reducing the number of prescriptions to reduce opioid addiction (Cicero & Ellis, 2017).

Opioid assessment tools administered by primary care providers, such as Webster's ORT, have been shown to significantly predict future opioid use disorder diagnosis (Lawrence, 2017). Webster's ORT opioid assessment tool provides a healthcare

provider with a series of questions that identify addictive tendencies or mental health concerns without being intrusive or threatening towards the patient. This DPI project aim was to reduce the opioid prescription rate among healthcare providers in an occupational healthcare clinic in central Indiana and thereby reduce the potential for future diagnoses of opioid use disorder.

The clinic chosen to participate in the DPI project was associated with an addictive medicine clinic. The treating physician recognized the importance of screening patients for their history and the start of opioid misuse. Literature and personal experience demonstrated the high risk an initial opioid prescription produces in patients with addictive tendencies. To ensure best practice, the clinic authorized the DPI project, recognizing the importance and validity of the results could bring to the practice of safe opioid prescribing.

Purpose of the Project

The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in central Indiana over four weeks. At the project site, the problem identified was patients with acute pain from an industry accident would receive a prescription for an opioid medication without being screened for other health or addictive tendencies. The independent variable was the implementation of Webster's ORT opioid assessment tool, and the dependent variable was the opioid prescription rate. Webster's ORT has been peer reviewed and is supported by the literature as an effective assessment tool for opioid misuse screening (see Appendix B) (Jones et al., 2015; Lawrence et al., 2017; Webster, 2005).

After receiving IRB approval, charts were assessed for prior injuries resulting in the prescribing of an opioid medication. The next four-week period demonstrated the implementation of Webster's ORT, and the opioid prescriptive rate was measured over four weeks. The project population was patients ranging in age from 19 to 99, acutely injured in an industrial accident. The providers working at the occupational health clinic volunteered to participate in this DPI project. This DPI project aimed to decrease the opioid prescription rate for patients with acute pain who screened as an elevated risk for opioid misuse. Alternative treatments, such as utilizing non-steroidal anti-inflammatory medications and promoting referrals for mental health care or social services, were used in place of prescriptions when an elevated risk for OUD was determined.

Clinical Question

The clinical question for this DPI project was:

Q. Does the implementation of Webster's ORT opioid assessment tool, impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks?

This DPI project aimed to decrease the opioid prescription rate for patients with acute pain who demonstrate a high risk for opioid misuse. The clinical question addressed the concerns of the purpose stated by the successful implementation of Webster's ORT and receiving clinical significance as an outcome. Occupational health providers were identified as uniquely positioned to help reduce opioid use disorder since they can identify individuals with a likelihood for abuse and refer those patients to alternative therapies (Higgins, 2019).

The independent variable was the implementation of Webster's ORT, and the dependent variable was the opioid prescription rate. Webster's ORT is peer reviewed and

demonstrated efficiency in providing accurate formal screening for opioid misuse (see Appendix B). The dependent variable was measured in a four-week interval. Webster's ORT was utilized during the four-week improvement project time interval, providing pre- and post-intervention nominal data.

Advancing Scientific Knowledge

The healthcare outcome of the DPI project related to a significant decrease in opioid misuse. People with undiagnosed, chronic mental illness were shown to be more likely to have alcohol and chemical dependency in the literature (Rogers et al., 2019). The pressure and demand of the contemporary workforce can result in an individual unsuccessfully maintaining meaningful employment and resulting in homelessness (National Institutes of Health [NIH], 2020). The migration of the homeless was found to lead to poor follow-up care in comparison to non-vulnerable individuals (Finlay, 2020). The value of community-based care has not been recognized due to the demonstrated short-term impact of these projects (Green, 2016). Wellness strategies, clinical prevention programs, and non-clinical prevention programs affect the cost of healthcare spending (Green, 2016). According to the NIH (2020), sustainable programs require a framework that captures the intricate necessities of the public and the stakeholders. This DPI project advanced scientific knowledge by implementing Webster's ORT opioid assessment tool to a high-risk population and formally screening for opioid misuse.

Several theoretical foundations provided the framework for this project: Skinner's behaviorist theory, Bandura's social cognitive theory, and Orem's self-care deficit theory. The behaviorist theory was developed by B.F. Skinner (1976) who stated individuals can unlearn a learned behavior. For this project, this theory was used to help individuals learn new coping mechanisms for pain versus relying on an opioid substance (Skinner, 1976).

Social cognitive theory (SCT) defines how an individual continues or modifies behavior concerning the response received from peers or society (Bandura, 1986). This theory was utilized in assisting the modification of how the patient related to the use of an opioid, how they expected the medication to help, and to what degree. Dorothea Orem's (1971) self-care deficit nursing theory presented that individuals desire to have regular feedback from their environment (Orem, 1971). In this project, the self-care deficit theory was used to recognize patients' needs and to allow for supportive and adaptive interventions to promote self-reliance and sustainability (Orem, 1971). The improvement project advances the use of behaviorist theory, social cognitive theory, and self-care deficit theory through manifesting a clear understanding of patient behavior, how to promote sustained change, promoting the investigation of family dynamics, and the expectations they have on pain management.

Significance of the Project

In the short-term, the significance of this project was a decreased risk of opioid addiction for patients who were formally screened with Webster's ORT and identified as high-risk for opioid misuse. The potential long-term benefits may have included healthcare cost savings due to reducing mental and physical health issues for an at-risk population, avoidance of depression and suicide, and reduced loss of quality of life (Shiner et al., 2017). Evidence-based education and assessments are effective in a variety of settings across populations (Cicero & Ellis, 2017; Nichter et al., 2019).

The decision to conduct a DPI project that focused on the provider understanding the pathophysiology, biochemical effects of stress on the mind, and the use of multiple theories in patients with chronic pain was chosen due to the daily request's patients make for narcotics in the occupational care setting. Shmagel et al. (2016) reinforced that the

relationship of opioid use disorder and lack of psychological care, physical therapy, or occupational therapy is the gap in literature, which this improvement project helped to fill. Patients with acute pain not related, not supported with imaging, or trauma require additional research to determine the cause of exaggerated pain response (Webster,2005) which was performed in this project by using Webster's ORT screening tool.

As demonstrated in the literature, providers who utilize Webster's ORT assessment tool can recognize patients who have addictive behaviors, mental stressors (anxiety, depression, PTSD) that could lead to opioid use disorder if prescribed a narcotic for pain (Webster, 2005). Therefore, implementing Webster's ORT at the project site may have provided significant health outcomes for patients. Further, by knowing these high-risk outcomes, providers could engage in additional care services or community services that could help guide the patient to improved mental health, while in conjunction, decreasing their pain.

Rationale for Methodology

Based on the purpose statement and clinical question for this DPI project, a quantitative methodology was employed. Quantitative methods are used with empirical data, collected using valid and reliable sources, to determine if causality is necessary and use inferential statistics to prove findings to a scientific degree (Leedy, Ormrod, & Johnson, 2019). Quantitative methods employ rigorous data collection and analysis procedures that can be duplicated exactly by another investigator (Leedy et al., 2019). Quantitative methods are used to measure the change in a dependent variable attributable to an independent variable (Polit & Beck, 2017). Based on the foregoing concepts, the most appropriate method to addresses the clinical question for this DPI project was quantitative as the project sought to determine how implementation of Webster's ORT

(independent variable) impacted the rate of opioid prescriptions (dependent variable) over four weeks.

A qualitative methodology would have been an alternative method to use. A qualitative method is phenomenological, ethnographic, and utilizes grounded theory (Wilson, 2020). This type of methodology investigates individuals' lived experiences, conditions, or situations and assesses groups or individuals and how they evolve as a culture (Wilson, 2020). The theoretical stance is derived from a research problem, and through interviews, review of the literature, and observing the study participants, a theory is developed (Wilson, 2020). Qualitative methods are subjective, whereas quantitative methods are objective and measurable (Wilson, 2020). A quantitative methodology was best for this DPI due to the nature of needing measurable results, validity, and reproducibility. Quantitative methods produce a power analysis and use a *p*-value (Wilson, 2020). The ability to reproduce the clinical and statistical results by using Webster's ORT for opioid use disorder screening determined the use of a quantitative method in this project.

Nature of the Project Design

A quasi-experimental design was selected to enable the use of inferential statistical procedures to examine how the impact of Webster's ORT opioid assessment tool (independent variable) would impact the opioid prescription rate (dependent variable) among healthcare providers in an occupational health care clinic (Polit & Beck, 2017). A quasi-experimental design involves the use of non-random samples in a controlled environment to measure the change in a dependent variable. A convenience sample of patients who experienced acute pain because of an industrial accident participated in the DPI project. A convenience sample is derived from a non-probability

sampling of individuals who meet the inclusion criteria and can be included efficiently (Leedy et al., 2019).

Data for the dependent variable, opioid prescription rate, were collected pre- and post-intervention from each of the participating providers at the project site. The initial phase of the improvement project was conducted by performing a chart review for injuries resulting in an opioid prescription. Next, the staff received education about Webster's ORT and the theories which served as the framework for the quality improvement project. The implementation of Webster's ORT began and concluded after four-weeks of use.

The patients filled out Webster's ORT immediately after the implementation information had been provided (see Appendix B). The form received a total score, indicating whether the patient was an elevated risk for opioid use disorder if prescribed an opioid medication. The forms were completed and collected for four weeks. These were then used to determine how many opioid prescriptions (dependent variable) were provided to patients with an elevated risk. The opioid prescription rate was calculated for the number of opioid prescriptions to patients presenting to the occupational health clinic for acute injury with pain before and after the implementation of the pain medication questionnaire. This was calculated as the ratio of opioid prescriptions for new patients to total new patients for the period. A Chi-square statistic was conducted using the Statistical Package for the Social Sciences (SPSS) version 27 to determine whether any change in the mean opioid prescription rate for the provider's pre- and post-intervention was statistically significant.

This DPI project aimed to measure the effectiveness of an interventional method with a quasi-experimental design. Given the aim of this DPI project, descriptive and

correlational designs were considered but ruled out based on the clinical question and the aim to demonstrate causality (Leedy et al., 2019). The purpose of showing causality was to answer the question, does the intervention affect the outcome or was there a variable that could affect the results solely due to the relationship between another common denominator (Taylor, 2019)? Variables that are correlated cannot be assumed to have causation (Taylor, 2019). The impact of the results under this design may demonstrate clinical significance without statistical significance (Taylor, 2019).

Definition of Terms

The following terms were used operationally in this project, providing the foundation for the improvement project. The theory selected as the framework was chosen after considering the logical progression patients can make by identifying and changing behaviors. Webster's ORT was chosen after being recognized by peers and validated against multiple assessment tools (Lawrence, 2017).

Social Cognitive Theory. The social cognitive theory (SCT) was used to guide health promotion and disease prevention programs (Bandura, 1986). The model explains and predicts individual changes in health behaviors. Bandura's SCT was used to understand health behaviors (Bandura, 1986).

Webster's Opioid risk tool (ORT). Webster's Opioid Risk Tool is an opioid assessment tool that assesses the psychosocial aspects of the patient, pain medication use, and addictive tendency of a patient (Webster & Webster, 2005). Lynn R. Webster and Rebecca M. Webster developed the ORT. The assessment tool has been shown to be beneficial in helping providers determine if an opioid prescription is safe for a patient experiencing an acute episode of pain (Webster & Webster, 2005).

Opioid use disorder (OUD). Opioid use disorder (OUD) involves the chronic misuse of opioid medications (prescribed or acquired) that affects mental, physical, and emotional health. It is typically a chronic, relapsing illness, associated with significantly increased rates of morbidity and mortality **(**Ho & Rosenheck, 2018).

Post-traumatic stress disorder (PTSD). Post-traumatic stress disorder is a disorder that develops after a person experiences an actual shocking, scary, dangerous event or when they relive an event that happened, resulting in an unhealthy stress response (NIH, 2020).

Stressors. Interpersonal stressors are emotional. Interpersonal stressors involve actions or reactions received from the individual's environment (Butts & Rich, 2013). Extra personal stressors are activities or policies outside of the individual (Butts & Rich, 2013).

Drug diversion. Drug diversion is obtaining or utilizing a medication inappropriately (Arbuck et al., 2019).

Assumptions, Limitations, Delimitations

There were several assumptions in this project:

1. The primary methodological assumption was ethical participation by the selected providers. Providers employed by the project site health clinic were required to report their opioid prescription rate before and after the educational intervention was presented. Prior studies suggested that conformity bias may have affected reporting (Delhomme, 1991). Participants were employed at the occupational health care clinic in Indiana, and individuals tend to conform in two ways: compliance and identification. In the case of this DPI, compliance meant that participants reported improvement as

a means of complying with the process and demonstrating their efficacy. Identification refers to the tendency to identify with significant peers. However, it was assumed that the participants were honest and open with their responses.

2. The primary theoretical assumption was that participants did not confer with one another before reporting data. The providers understood this project was not an attempt to demean or chastise their prescriptive decisions. Instead, it demonstrated how formal screening can identify potential problems due to medical or psychological issues the patient was having.
3. Another theoretical assumption was that providers, who practice ethically, would be willing to change their behavior based on the intervention Webster's Opioid Risk Tool (ORT) outcomes. Safe prescribing and preventing harm are the goals of healthcare. A provider is first sworn to do no harm.

Also, there were several limitations to this project:

1. The amount of time allotted to measure the impact of Webster's ORT on the opioid prescription rate was a limitation. The consequence for the length of the improvement project was the longevity of change and the use of alternative pain medication when a patient has a high Webster's ORT score. Solid statistics that supported the use of Webster's ORT as an addictive behavior tool would benefit from a minimum six-month period of screening.
2. Additional inquiries into the State of Indiana's prescription monitoring site would have validated the outcomes of patients with higher risk scores and the continuation to seek out additional prescriptions from multiple providers (Webster & Webster, 2005).

3. The reduction of workforce-related to COVID-19 may have limited the sample size and affected opioid prescription rates. The longevity of the results was not able to be recognized as the period for conducting the DPI project did not allow for chart reviews of the providers participating in the initial study.

There were several delimitations or aspects of the improvement project that could not be controlled:

1. The first delimitation was related to the problem. Inappropriate opioid prescriptions being prescribed for acute pain without formal screening and identification of patients at-risk for developing opioid use disorder was the problem, but this was controlled by implementing an evidence-based screening tool, Webster's ORT.
2. All patients were being treated in an occupational health care clinic for acute pain related to an industrial accident.
3. The affect the limitations, delimitations, and the methodology had on the outcome of the improvement project all related to the dependent variable (opioid prescriptions for acute pain) and whether the provider was able to formally screen the patient for an elevated risk of developing opioid use disorder if provided an opioid prescription.

Summary and Organization of the Remainder of the Project

Opioid use disorder has been identified as a problem that continues to climb despite the requirements of shortened prescription lengths and pressure from licensing agencies on providers to reduce opioid prescriptions (CDC, 2020). As demonstrated, there was an unknown effect on opioid use disorder and the effects of OUD when providers routinely utilizing an assessment tool and recognize potential OUD in patients

before this project (Arbuck & Fleming, 2019). The prescriptive rate of narcotics in the United States in 2012 peaked at 255,207,954 (CDC, 2020). The education of providers regarding the chemical changes the brain undergoes when exposed to stress throughout life has been shown to help provide effective care for patients with OUD (Lupien, Juster, Raymond, & Marin, 2018). The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in central Indiana over four-weeks. The clinical question was: does the implementation of Webster's ORT opioid assessment tool, impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks?

The behaviorist theory provided a baseline and understanding of how individuals associate stimuli and responses (Butts & Rich, 2013). Learning is related to performance versus the logic of thinking (Butts & Rich, 2013). The change in the thought process and emotional recognition progress as the individual becomes confident in the change through this framework. The improvement in confidence leads to the desire to continue changing (Butts & Rich, 2013). The significance of using the behaviorist theory as a framework for determining the risk for opioid use disorder was related to the person's ability to deal with stressors. Webster's ORT was shown to be effective in screening patients for the triggers that could lead to the development of opioid use disorder (Webster & Webster, 2005).

The SCT revolves around the concepts that individuals learn through their life experiences, observation, and results of actions (Butts & Rich, 2013). The SCT correlated

to the misuse of opioids as it provided a framework for understanding an individual's personal circumstances that may impact their behaviors. Behavioral interventions include self-control, reinforcement, and self-efficacy (Butts & Rich, 2013). Dorothea Orem's self-care deficit theory was used as the nursing theory as it aligned with SCT. Both concepts relate to the benefit of the patient working to self-promote healing and self-efficacy (Irshad, 2018).

A quantitative, quasi-experimental design was most appropriate to answer the clinical question, which focused on the impact of the independent variable on the dependent variable. The independent variable was the implementation of Webster's ORT (see Appendix B). The dependent variable was the rate of opioid prescriptions for acute pain, which was measured using completed Webster's ORT worksheets and collected from the primary care providers. This was measured over four weeks.

Chapter 2 presents a review of the literature that laid the groundwork for this DPI project. The literature review discussed stress, PTSD, social cognitive theory, mental illness, and how they all contributed to the decreased tolerance of pain and the increased misuse of opioids. Chapter 3 presented the methodology of the project in more detail. Chapter 4 provided the results of data collection and analysis. Chapter 5 included the interpretation of the findings and recommendations for future projects and practice.

Chapter 2: Literature Review

The management of chronic pain, not related to cancer, has led to severe opioid misuse and inappropriate writing of prescriptions for the opioid medication (CDC, 2020). The surge of prescriptions was related to aggressive marketing and the production of a new medication called Oxycodone (Higgins, 2019). Hospitals and pharmacies increased their orders for narcotics from the years 1999 to 2010 by 400% (Higgins, 2019). Pain became the fifth vital sign (Higgins, 2019). The recommendation for aggressive use of opioids was made by pain management providers and healthcare facilities (Higgins, 2019). The prescriptions of narcotics increased from the encouragement of pain management leaders (Higgins, 2019). The increase was steady from 2006 (72.4 prescriptions per 100 persons) through 2012 (80.0 prescriptions per 100 persons) (Higgins, 2019). The areas of medicine prescribing the most narcotics were pain medicine (48.6%), surgery (36.5%), and physical medicine (35.5%) (Higgins, 2019). The CDC reported a decline in prescriptions for narcotics; however, Higgins et al. (2016) noted the rate was still elevated at 66.5 per 100 persons. The purpose of this quantitative quasi-experimental quality improvement project is to determine if or to what degree the implementation of Webster's Opioid Risk Tool would impact the opioid prescription rate among healthcare providers compared to current practice in an occupational care clinic in Indiana over four weeks.

A literature review of peer-reviewed articles was completed using CINAHL, Medline, and PubMed. The keywords included musculoskeletal pain, post-traumatic stress disorder (PTSD), anxiety, depression, conditioning, opiate use disorder (OUD), and cognitive behavior therapy. There was a total of 2,984 sources returned. Inclusion and exclusion criteria were applied, resulting in 2,334 sources; however, only 150 were

reviewed. Inclusion criteria were adults 18 to 99 years of age, PTSD, anxiety, stress, and pain. Ensuring the quality measure of 85% articles were published within five years, exclusion criteria were articles with publication dates greater than five years, long-term narcotic prescriptions, and pregnancy.

There was a total of seven themes identified in the literature and related subthemes. The themes included stress and opioid use disorder, the relation between trauma and opioid use disorder, anxiety and opioid misuse, nonpharmacological treatment of chronic pain, diversion of medicine, chronic polysubstance use disorder, and chronic pain. The subthemes included effects of stress through the life span, hypervigilance in pain, cognitive behavior therapy, PTSD and substance abuse, treatment of substance use disorder with PTSD, cognitive and mindfulness-based therapy for adolescents with PTSD and substance use disorder, psychiatric severity, comorbidity, cognitive behavior therapy, prevention and treatment of opioid misuse and addiction, alcohol, benzodiazepines, musculoskeletal pain, illicit substance use in U.S adults with chronic lower back pain, opioid use disorder assessment tools and drug screening, and pain assessment tools.

Pain is multi-sensory and manifests in numerous ways (Arbuck et al., 2019). Individuals may exhibit functional loss, emotional instability, physical symptoms, and behavior changes when in pain (Arbuck et al., 2019). The inconsistent use of pain scales, reliance on self-reporting of pain, and the inexperience of managing chronic pain have led to opioid use disorders (Arbuck et al., 2019). Opioid use disorder (OUD) is the intentional misuse of opioid medication or drugs (Arbuck et al., 2019).

In one study, patients examined during an inpatient hospitalization had a 94% symptomology of post-traumatic stress disorder (PTSD) and misuse of opioids (Schifano

et al., 2019). Of those 94%, 38% had active PTSD, while 51.9% had chronic PTSD (Schifano et al., 2018). The severity of PTSD has been correlated with the misuse of opioids alone or in combination with the use of opioids and sedatives or with cocaine (Schifano et al., 2018). The use of alcohol and opioids is a self-destructive, self-prescribed treatment that patients self-administer to help cope with the hypervigilance of PTSD (Schifano et al., 2018). The research emphasized that a relationship exists between chronic pain and PTSD, which also emphasized how severe psychological stress and pain circuits converged (Schifano et al., 2018).

Guidelines from the Center for Disease Control and Prevention and the recommendations for opioid prescriptions have renewed the attention of a complete treatment plan and responsible prescribing for chronic pain management (Arbuck & Fleming, 2019). Between the years 2006 to 2012, a steady increase in opioid prescriptions was observed (Higgins, 2019). The total number of prescriptions in 2012 peaked at 255,207,954 (CDC, 2020). The prescription rate was equivalent to 81.3 per 100 persons receiving a prescription for an opioid medication (CDC, 2020). In 2018, providers in 11% of counties in the United States wrote opioid prescriptions in such high quantities that every person in the assigned county could have received an opioid medication (CDC, 2020).

Recent education regarding chronic pain has incorporated the emotional, sensory, and objective aspects of a patient's pain experience (Arbuck & Fleming, 2019). Through the utilization of screening tools, assessing the patient for post-traumatic life events, addictive tendencies, or symptoms of mental illness, the provider and patient can develop a plan of care that supports the strategic plan, process, and outcome criteria directed from the Centers for Medicare and Medicaid Services and reduce the patient’s risk of opioid

misuse (CDC, 2020). The identification of patients with underlying mental health problems or addictive behaviors can prevent a provider from prescribing a medication that could result in an opioid use disorder for a patient (Arbuck & Fleming, 2019).

The rest of this chapter presents a review of the literature. It begins by addressing the theoretical foundations, behaviorist theory, and social cognitive therapy. Then, it presents the current studies which informed this project. The literature was categorized into the themes, the relationship between stress and opioid use disorder, the relationship between trauma and opioid use disorder, anxiety and opioid misuse, nonpharmacological treatment of chronic pain, diversion of medicine, chronic polysubstance use disorder, chronic pain, and the related subthemes. The chapter ends with a summary that illustrates how the literature informed this project.

Theoretical Foundations

The theoretical frameworks for the DPI project were behaviorist theory, as developed by B. F. Skinner (Skinner, 1976), and social cognitive theory, developed by Albert Bandura (1971). Dorothea Orem's self-care deficit theory provided the nursing framework. Behaviorist theories suggest that learned behaviors can become unlearned by modifying stimulus and conditions (Skinner, 1976). Therefore, the person can adjust the behavior. Social cognitive theory suggests that learning occurs based on social interactions between individual action and the responding environment reaction (Bandura, 1971). Orem's theory discusses the evaluation of the patient's abilities to care for themselves, the development of a plan of care that promotes and guides the patient into increased ability to perform their activity of daily living (ADL) tasks (Orem, 1971).

Skinner's behaviorist theory. In Skinner's (1976) behaviorist theory, actions displayed by a person relates to their thought process. The stimulus calling the patient

into action corresponds to the environment and conditions (Skinner, 1976). How an individual respond to situations often is a learned response (Skinner, 1976). The model of learning hypothesizes life is a habit, requiring a small amount of thinking (Skinner, 1976). Learned behaviors can become unlearned. Modification of stimulus, conditions, and response adjusts the behavior (Skinner, 1976). The redirection of action directs the emotional response. Continued practice is followed by positive emotions (Butts & Rich, 2013).

Patients change actions with greater comfort as they discuss intimate, raw feelings using this framework (Lunde, Nordhus & Palleson, 2009). However, the patient must have the desire to change, followed by the therapist changing the stimulus and response (Butts & Rich, 2013). Secondly, the patient must understand the difference between primary and secondary drives, which are related to survival instincts (thirst, hunger, and sex) (Butts & Rich, 2013). Culture strongly affects the secondary drive. Patients struggle during times of satiety to make a change (Butts & Rich, 2013). The primary drive, the desire for food, housing, avoidance of pain, and sex, are natural biological responses; therefore, they are unlearnable (Butts & Rich, 2013). The primary response follows the all or nothing principle. Learning is achieved when a person does not possess a skill and then accomplishes the task (Butts & Rich, 2013). Practice cements the knowledge base through continued stimulus and response (Butts & Rich, 2013). Learning is meant to translate outside of oneself (Butts & Rich, 2013).

The behaviorist theory was shown to be useful in the treatment of PTSD and OUD (Lunde, Nordhus & Palleson, 2009). This quantitative study evaluated the effects of cognitive behavior therapy on the elderly population with chronic pain. The study

ascertained the effects of challenging the patient to alter their thoughts and fear of pain (Ounde, Nordhus & Palleson, 2009).

Care provided to the inpatient for PTSD and OUD is designed to help the patient once they leave inpatient status. Success in behaviorist theory treatment mostly focuses on the ability of the therapist to read the reactions of the patient (Butts & Rich, 2013). Approaches in behaviorist theory include classical conditioning, operant conditioning, increasing a response, and decreasing a response (Butts & Rich, 2013). Classical and operant conditioning response is a reinforcement-based treatment (Butts & Rich, 2013). Reinforcement is either positive or negative, but research showed that positive reinforcement promotes learning best (Butts & Rich, 2013). Increasing or decreasing a response will reinforce behavior or deter it (Butts & Rich, 2013).

In this project, the behaviorist theory was used to help understand the patients and promote meaningful conversations with patients who have higher Webster's ORT scores. Patients who feel they are being understood, interpret the discussion as receive education versus judgment, and are prepared to work with different care modalities and seek additional assistance for mental health care as indicated.

Bandura's social cognitive theory. The social cognitive theory (SCT) promotes health change by working with personal factors, environmental and behavioral interactions (Bandura, 1986). Learning is individualized, a process working through assessment and performance. Observational learning, reinforcement, self-control, and self-efficacy construct the SCT (Bandura, 1986). Behavioral contracts establish goals and guidelines for the patient (Butts & Rich, 2013). Individual recognition of reaching attaining short-term goals enhances an individual's self-esteem (Bandura, 1986). Positive reinforcement encourages the patient to continue efforts towards recovery. The

incorporation of problem-solving, self-reflection, and personal responsibility is infused as goals are achieved (Bandura, 1986). Recovery from OUD frequently requires patients to change their living environment, role models, and places of socialization (Butts & Rich, 2013). Additional support groups, such as narcotics anonymous, promote healthier conditions, resulting in more robust results and relationships (Butts & Rich, 2013).

Social cognitive theory has been utilized in the practice of decreasing alcohol intake in adolescents (Hayden, 2009). The results reflected the community attitude about adolescent alcohol consumption needed changing before the change would be effective in the school grades 6-12 (Hayden, 2009). Additionally, SCT was utilized in a study affecting Acquired Immune Disease (AIDS) in inner-city teenagers (Hayden, 2009). The recognition of support from a peer source and the responsibility of proper precautions improved the overall new case number statistics (Hayden, 2009).

SCT was used in this project to evaluate the expectations the patient had about pain control, what was acceptable, and how they dealt with pain in general (did they always need to take medicine, or could they distract the pain with other activities). The patient's overall fear of actual or anticipated pain reflects on overall pain management ability (Hayden, 2009). The modification of a patient's thoughts about pain, assisted the patient with elevated risk scores accepts alternative methods for managing acute pain.

Orem’s self-care deficit theory. Dorothea Orem's self-care deficit theory demonstrates that patients have a responsibility to participate in their care (Orem, 1971). Self-care is a learned skill and success relates to performing the tasks with a purpose (Orem, 1971). Nursing theories establish the structure, organization, and systematic means of collecting data (Gligor & Domnariu, 2020). Orem's theory is layered (Gligor &

Domnariu, 2020). Initially, the need and limitations of the patient are explored. The patient may need complete care, partial or limited nursing care (Orem, 1971).

Orem's self-deficit care theory has been utilized in studies that assessed nurse's anxiety, nursing burnout, management of schizophrenia, heart failure, and hypertension (CINHAL, 2020). Orem's theory spans across multiple fields of nursing and medicine. The continuation of assessment, adjusting the intervention, and re-evaluating the progress and improvement of decline in the patient's self-care is base for patient care (Orem, 1971).

Dorothea Orem's nursing theory applied to the DPI. The self-care deficit was used as a screening foundation, and produced a measurable outcome (Orem, 1971). This was significant to the goals of the DPI, identifying the level of care the patient would require achieving self-actualization (Orem, 1971).

Review of the Literature

A thorough review of the literature was completed and established the need for the DPI project. In the literature, seven themes were found. The first theme was relationships between stress and opioid use disorder. The subthemes were the effects of stress throughout the life span, hypervigilance in pain, cognitive behavior therapies. The second theme was the relationship between trauma and opioid use disorder. The subthemes included PTSD and substance abuse, treatment of substance use disorder with PTSD, treatment study of cognitive and mindfulness-based therapy for adolescents with PTSD and substance use disorder. The third theme was anxiety and opioid misuse. The subthemes were psychiatric severity and comorbidity. The fourth theme was nonpharmacological treatment of chronic pain with the subthemes of cognitive behavior therapy and mindfulness-based stress reduction. The fifth theme was the diversion of

medicine with the subtheme opioid medication and prevention and treatment of opioid misuse and addiction. The sixth theme was chronic polysubstance use with subtheme alcohol and benzodiazepines. The seventh theme was chronic pain. The subthemes were musculoskeletal pain, illicit substance use in U.S (United States). adults with chronic lower back pain, opioid use disorder, drug screening, pain assessment tools, an opioid medication, and prevention and treatment of opioid misuse and addiction.

Deaths from drug overdoses increased by over 11% between 2014 and 2015, supporting the need for identification of problematic opioid use in additional health care settings (Lindley, Cox, & Cochran, 2019). Opioid use can be identified using screening tools and evaluating prescription drug monitoring systems (Lindley et al., 2019). Assessment tools have been trialed in community pharmacies, primary care clinics, and in hospitals (Lindley et al, 2019). While an assessment tool is effective in screening for both the psychosocial aspects of OUD and addictive tendencies, a complete physical assessment, utilization of laboratory testing for illicit substance and social service interviews are useful in a complete assessment of a patient with chronic pain (Arbuck & Fleming, 2019).

Many people in the U.S. experience problems related to the unhealthy use of illegal drugs and the nonmedical use of prescription psychoactive medications (U.S. Preventive Services Task Force [USPSTF], 2020). Unhealthy drug use is more commonly reported by young adults aged 18 to 25 years (USPSTF, 2020). An estimated 8 million persons 12 years or older met diagnostic criteria for drug dependence or abuse of drugs in the past year (USPSTF, 2020). Opioid drug use can cause many serious health effects that vary by drug type, administration mode, amount, and frequency of use as well

as pregnancy status (USPSTF, 2020). Opioid use can cause drowsiness, slowed breathing, constipation, coma, and fatal overdose (USPSTF, 2020).

Relationship between stress and opioid use disorder. Opioid use disorder is a highly disabling psychiatric disorder. The disruption of the patient's ability to care for themselves can have negative health outcomes and show relation to infectious disease and fatal overdose (McHugh et al., 2017a). It was shown in a cross-sectional study that the use of benzodiazepine medication places the patient at high risk for overdose (McHugh et al., 2017a). The purpose of this cross-sectional study was to describe the rationale and methods for behavioral treatment development versus the use of benzodiazepine medications in patients to manage anxiety diagnosed with opioid use disorder. The study was designed to develop and test an integrated cognitive-behavioral therapy in patients with OUD and anxiety disorders. It was discussed and theorized that cognitive behavioral therapy (CBT) was effective in assisting in the management of opioid use disorder, and patients utilizing a benzodiazepine for anxiety or nonmedical use were at an increased risk for overdose when combined with alcohol or other narcotic medication. The DPI benefited from this article by supporting Webster's ORT and how at-risk behavior is assessed.

Effects of stress throughout the lifespan on the brain, behavior, and cognition. Lupien, Juster, Raymond, and Marin (2018) proposed there are three factors relating to stress that affect the brain in humans and animals. The effects of stress in the different sexes showed females develop depression in a 2:1 ratio (Lupien, Juster, Raymond, & Marin, 2018). Interfamily stress, self-awareness, and the early start of menses increased the risk of depression in females (Lupien et al., 2018). Environmental toxins, such as elevated lead levels, have been shown to cause increased cortical responses in children

(Lupien et al., 2018). The third factor involved the sleep cycle, or circadian rhythm (Lupien et al., 2018). The understanding of the developmental phases that acute and chronic stress can impose on the cognitive status of individuals must be investigated so proper interventions can be put in place to reduce individuals' risk for chemical dependency (Lupien et al., 2018). The authors stated there are further studies that are required to further understand the effects of pathology on the brain stress produces). The article was limited as statistical validation was not present. A collateral study with clear variables of comparison would have enhanced the strength of the article. The benefit the DPI project gained from the information was the understanding that early in life, stress can start the process of developing a higher risk of addiction. The providers should ensure they are exploring the history of the patient's family, age of menarche (if female), and risk of environmental exposures

A motivational account of attention to pain. The anticipation and fear of pain can place the patient in a state of hypervigilance. Van Damme, Legrain, Boit, and Crombez (2010) stated the utilization of attentional distraction utilizes techniques that can decrease the pain the patient perceives. The focus of the study was to ascertain if pain can be reduced by focusing attention on different objects or thoughts (Van Damme, Legrain, Vogt, & Crombez, 2010). The rationale was designed to evaluate chronic pain and how pain is perceived. The results show an individual response to pain is directed by the personnel history to pain. Hypervigilance or perception of the threat of pain exacerbated the perceived pain experienced by the patient (Van Damme et al., 2010). Keywords included pain, attention, hypervigilance, motivation, and distraction. The relationship of this article to the DPI project was an assessment tool was used to identify elevated psychosocial scores are indicative of a high risk of OUD if a narcotic was prescribed.

Youngcharoen, Vincent, and Park (2017) incorporated two different behavior models to assess how nurses provided pain management postoperatively. This was a cross-sectional study, and 140 nurses participated. The results of the study demonstrated that the nurse's beliefs, attitudes, perceived normal behavior of pain were related to how they provided pain management to postoperative patients (Youngcharoen, Vincent, & Park, 2017). The article hypothesis inferred the level of nurse's experience, type of hospital the nurse practiced at, and personnel beliefs of opioid use determined whether the nurse administered opioids to their elderly patients (Youngcharoen et al., 2017). The limitations of the study were related to the bias the nurse could have about opioid addiction versus the actual risk the patient exhibited to developing an opioid disorder. The benefit to the DPI project was the investigators' use of an assessment tool to help determine the risk for the patient instead of the staff's personnel beliefs about opioids.

Cognitive-behavioral therapy for pain management. Lupien et. al (2018) discussed the effects of stress on the mind's ability to manage pain. The hypervigilance of perceived pain raises the cortisol levels, which over a period, decreases the mind's ability to process pain appropriately (Okkersen et al., 2018). The anticipation of pain, or pain related to past events, can lead to an exacerbation of pain without significant cause (Okkersen et al., 2018). The understanding of positive and negative stress, and the patient's adaptability, relates to the amount of adaptation the patient must utilize (Slavich et al., 2020).

Positive stress and negative stress require the ability to adapt and change to the present circumstances. A patient's mental status reflects how well they can manage stressors. Stressors easily managed can include hunger and thirst. Entrapment stressors include problems a patient may have with stable housing and interpersonal relationships

(Slavich et al., 2020). As the level of stress builds, a person's threshold of tolerance and manageability may be maximized (Slavich et al., 2020). The article supported the outcome of the response of the stress (effective or harmful) can be reflected on the timing the event occurs in the patient's life. Maladaptive behaviors can develop after a person experiences a dangerous event, and the fight or flight response is invoked (Slavich et al., 2020). The patient who cannot resolve the stressor afterward and lives in continuous fear exhibits maladaptive behaviors (Slavich et al., 2020).

This was a correlational study using parametric information from persons recruited to the study. Pearson's correlation analysis was used to assess the pre-cognitive behavior therapy values (Slavich et al., 2020). The age of the patients between male and female were homogenous ± 3 years difference. Females scored higher in emotional dimensions, and men scored higher in chronic pain syndrome (Slavich et al., 2020). The outcomes demonstrated females had a greater empathic domain versus men, yet it could not significantly find clinical improvement in pain. The study did achieve the goal of showing cognitive behavior therapy was effective in how a patient interprets pain and manages it. The benefits and strengths of this article show, again, the importance of including Webster’s ORT for patients exhibiting pain that is not matching the clinical picture. Limitations to the study included the size of participants, placing it at risk for bias (Slavich et al., 2020). The variables were not independent of each other, and chronic pain patients were not assessed with normal parameters. It was recommended that longitudinal studies for long-term effectiveness be considered (Slavich et al., 2020).

In summary, the articles of the theme concerning the relationship between stress and opioid use disorder is beneficial to the DPI as they demonstrated that stress

(perceived or actual) can have long-term effects on an individual. The articles also supported the use of an assessment tool, such as Webster's ORT, to evaluate mental health concerns or other addictive tendencies a patient exhibit. A weakness in the studies was a gap between insignificant statistical values or sample groups that could withstand scrutiny for bias.

The relation between trauma and opioid misuse. Post-traumatic stress disorder can be a self-limiting psychiatric disorder. Per Frijling Olff, and van Zuiden (2019), 10% of people exposed to trauma develop PTSD, and early intervention is the key to preventing a medication reliance to manage the PTSD. A systematic review of the literature was performed, and propranolol, escitalopram, and benzodiazepines were found not to be likely to reduce the development of PTSD (Frijling et al., 2019). It was concluded that there were no pharmacological preventive interventions ready for routine clinical practice immediately following a traumatic event, preventing PTSD from manifesting (Frijling et al., 2019). This supported the DPI project, demonstrating the importance of screening for life-altering events that will need psychosocial support, and not prescribing medications that have addictive properties during the initial examination.

Post-traumatic stress and substance misuse. Schifano et al. (2018) stated there are four characteristics of PTSD: the intrusion of thoughts, avoidance of situations, changes in mood/cognition, and hypervigilance. The authors focused on presenting a thorough overview of the several types of PTSD, the use of illicit drugs, and high-risk behavior that predisposed a person to trauma (Schifano et al., 2018). A Bayesian meta-analysis and meta-regression was used to evaluate the consumption of alcohol, and findings showed an increase within two years of experiencing a traumatic event (Schifano et al., 2018). A cross-sectional study evaluated veterans with alcohol use disorder and the

correlation of having substance use disorder as well. It was noted that 55% to 75% of veterans with alcohol use disorder or substance use disorder were also diagnosed with PTSD and depression (Schifano et al., 2018). Opioid misuse was associated with PTSD whether by prescription or illicit use (Schifano et al., 2018). The strength of the study was the findings correlating the excessive use of pharmacological products to manage the symptoms of PTSD (chronic pain, insomnia, and anxiety) and the increased risk for diversion behaviors. Alternative treatments included medical marijuana, oxytocin, and beta-blockers (Schifano et al., 2018). The DPI project benefited from this study as the authors concluded the stressors of PTSD do not stop at a personal experience but can include manifestations of fears of being exposed to trauma also (Schifano et al., 2018). These findings supported the DPI through the understanding of the psychological aspects that can affect how patients process traumatic events.

Complex trauma, posttraumatic stress disorder (PTSD), and substance use disorder (SUD) are like parts of a prism—different lenses from which to see into clients' often-tragic past. Though they may have formal diagnostic representations that lead us to view them as separate entities, they are highly related in the day-to-day experience of clients' lives. Complex trauma, posttraumatic stress disorder (PTSD), and substance use disorder (SUD) are like parts of a prism—different lenses from which to see into clients' often-tragic past. Though they may have formal diagnostic representations that lead us to view them as separate entities, they are highly related in the day-to-day experience of clients' lives. Complex trauma, posttraumatic stress disorder (PTSD), and substance use disorder (SUD) are like parts of a prism—different lenses from which to see into clients' often-tragic past.

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Treatment of substance use disorder and PTSD. Najavits and Hien (2013) conducted a review, combining substance use disorder (SUD) and posttraumatic stress disorder (PTSD). Patients can develop PTSD from a traumatic event, such as military combat, or acquire PTSD from repeated invasive thoughts about an event that occurred to someone else (Najavits & Hien, 2013). Patient's experiencing PTSD along with opioid use disorder (OUD) require treatment that encompasses both issues (Najavits & Hien, 2013). The review of the treatment studies reflected treatment should be individually devised (Najavits &Hien, 2013).

Mills et al. (2016) examined the change in PTSD symptom severity with the use of integrated exposure-based psychotherapy. The outcomes were measured using two different assessment tools. The difference in the scores between the two tools reflected half of the participants had clinically significant improvement in PTSD symptoms and severity (Mills et al., 2016). The use of the tools improved the predictors of PTSD, therefore improving treatment. The article supported the DPI project due to proving the use of assessment tools help providers identify risk factors, resulting in faster initiation of care, decreasing the risk of OUD.

Cognitive and mindfulness-based therapy for substance use disorder. Fortuna, Porche, and Padilla (2018) utilized descriptive statistics and a paired sample *t*-test to evaluate the feasibility, safety, and potential clinical effectiveness of integrated therapy for adolescents with PTSD, depression, and substance use. Thirty-seven participants began the study with a retention of 62% (Fortuna et al., 2018). It was found there was a high risk for poor treatment retention and poor clinical outcomes among adolescents with

PTSD and co-occurring disorders (Fortuna et al., 2018). The outcomes for patients who were retained in the therapy achieved meaningful improvement in PTSD and depression symptom severity after receiving the cognitive and mindfulness dual diagnosis approach (Fortuna et al., 2018).

In summary, the articles of the second theme, the relationship between trauma and opioid use disorder, supported the use of Webster's ORT opioid assessment tool at the project site. The support was most prevalent in the subtheme articles that discussed the correlational relationship of PTSD and OUD occurring simultaneously. Screening for these aberrant behaviors ensures timely treatment. The weakness of the literature was that, again, the sample sizes were small.

Anxiety and opioid misuse. Chronic pain has been associated with the misuse of opioids (Rogers et al., 2019). Anxiety sensitivity (fear of anxiety-related physical sensations) is linked to pain experience (Rogers et al., 2019). A non-parametric study was conducted, utilizing 429 adults with chronic pain and prescribed long-term opioids (Rogers et al., 2019). The article examined how chronic pain is exacerbated by anxiety, and how the combination of medications utilized to treat anxiety can potentiate the effects of opioids. The study directly correlated to the DPI project and the use of Webster's ORT, finding the potentiality for OUD, and altering the plan of care.

An increase in anxiety sensitivity (fear of anxiety symptoms and sensations) can cause primary stress, motivating a behavior trend that leads to avoiding distressing states (McHugh et al., 2017b). Acquired versus traumatic post-traumatic stress disorder leads to heightened anxiety when the patient is presented with the stimulating factor and accordingly, is associated with coping motives for substance use (McHugh et al., 2017b). Women reported using substances to cope with negative emotions more often than men

(McHugh et al., 2017b). The aim of this study was to examine whether nonmedical benzodiazepine use was associated with higher anxiety sensitivity diagnosed with opioid use disorder (McHugh et al., 2017b). The article supported the DPI project screening tool as the authors screened for anxiety and addictive behaviors.

Psychiatric severity. Weinstock, Alessi, and Petry (2007) assessed the relationship between psychiatric severity and substance use disorders treatment outcomes. The sample was divided into groups of low, moderate, and high psychiatric severity based upon baseline Addiction Severity Index psychiatric composite scores. Participants in the high psychiatric severity group reported a greater prevalence of psychiatric hospitalization, psychiatric medications, and suicide attempts as well as poorer baseline psychosocial functioning (Weinstock et al., 2007). In terms of treatment outcomes, a significant interaction between psychiatric severity and treatment modality was found concerning treatment retention. Participants in the standard treatment condition were more likely to drop out of treatment earlier as psychiatric severity increased, while retention was similar across the psychiatric severity groups in the contingency management condition (stimulus control and consequences to modify behavior) (Weinstock et al., 2007). Psychiatric severity was not linked to the longest duration of abstinence achieved during treatment or adherence with contingency management procedures. Overall, these findings suggested contingency management was an efficacious and appropriate intervention for individuals across a wide range of psychiatric problems. These findings supported the use of cognitive behavior therapy in the DPI project and the endorsement of unlearning behaviors for long-lasting change.

Comorbidity. Opioid use disorder and anxiety disorders are highly associated. Anxiety and OUD are marked by severe clinical presentation and a poorer prognosis for

treatment. The morbidity and mortality between the two are substantial (Langdon, Dove, & Ramsey, 2019). Understanding the factors related to the high rate of occurrence was the aim of the article by Langdon, Dove, and Ramsey (2019). The treating and addressing of opioid-related and anxiety-related symptoms included how a patient processes intolerance distress and pain-related anxiety. Future work was needed to identify other mechanisms as well as develop specialized treatments to augment standard medication-assisted treatment (Langdon et al., 2019).

Anxiety is an emotion that can cripple an individual mentally (Langdon et al., 2019). Increased anxiety exacerbates pain (Langdon et al., 2019). The attempt to manage the anxiety with the use of medication is frequently in the benzodiazepine medication family (Langdon et al., 2019). The use of an opioid is potentiated by benzodiazepine, causing a euphoric state of mind (Langdon et al., 2019). Patients with an intolerance to stress will seek methods to escape the distressing thoughts. Anxiety is recognized as a precursor to OUD (Langdon et al., 2019). Webster's ORT screens the patient for addictive behaviors, anxiety, and pain (Webster & Webster, 2005). The elevated scores on Webster's ORT are recognition of the need to offer alternative methods of treatment instead of opioids for pain or benzodiazepine for anxiety (Webster & Webster, 2005).

Opioid drug use and the measurement of use in chronic pain and in the general population was the focus of this study as they are the patients at the greatest risk for misuse. Providers in pain clinics, based on studies, have not received adequate training to effectively manage patients with chronic pain (Webster, 2005). The measures one study utilized a list of prescriptive and illicit drugs, alcohol, and benzodiazepine class medications (Mojtabai, Amin-Esmaeili, Nejat, & Olfson, 2019). Illegal activities, healthcare visits, use of medical marijuana, mental health stress, and suicidal ideation

were studied (Mojtabai et al., 2019). Statistical analysis included information from sociodemographic and health characteristics. The authors concluded addictive tendencies increase the risk of opiate use disorder (Mojtabai et al., 2019).

Prescription of opioids for the treatment of chronic pain, updating the practice of pain management, and co-morbid mental illness was the focus of Bernardy and Montano (2019) in their article. The definition of PSTD, the co-dependence of alcohol, use of benzodiazepine class medications while taking an opiate for chronic pain tripled from 2003 to 2017 (Bernardy & Montano, 2019). The article summarized that the treatment of PTSD incorporated OUD, but the treatment of OUD did not investigate the patients' histories to assess for PTSD. Recent studies focused on evidence-based treatment and utilizing psychotherapy, which demonstrated improvement in symptoms of PTSD (Bernard & Montano, 2019).

In summary, the third theme, anxiety and opioid misuse and the subthemes, supported the DPI project by demonstrating the risk of stress, illicit drugs, and traumatic events that can lead to OUD. The importance of screening was indicated and supported the use of Webster's ORT. The weakness of the articles relates to the lack of additional studies the subthemes could be measured against.

Non-pharmacological treatment of chronic pain. Alternative therapy for the treatment of pain versus only pharmacological treatment has been studied through literature reviews and non-parametric evaluations. While cognitive behavior therapy has not been demonstrated to decrease pain, it has been demonstrated to have positive effects in how patients cope with their pain (Lunde et al., 2009). Cognitive behavioral therapy offers patients the ability to learn new coping skills instead of relying on an opioid (Lunde et al., 2009).

Cognitive-behavioral therapy. Cognitive therapy was effective in self-reported pain experience but did not affect symptoms of depression, physical functioning, or medication use (Lunde et al., 2009). The literature review by Lunde et al. (2009) aimed to evaluate whether cognitive and behavioral therapy would affect chronic pain experiences in the elderly. The scope of the study was an elderly population living in a community or institution. Rationale involved the evaluation of how living with pain affects the overall function and quality of life of an individual (Lunde et al., 2009). The authors found CBT has a greater effect on older adults, women, and individuals with higher education. The outcomes of CBT are affected by the level of psychiatric severity the person exhibits, and whether there are additional care modalities incorporated (Lunde et al., 2009).

Mindfulness-based stress reduction. Mindfulness-based stress reduction (MBSR) is beneficial to patients as it can enhance their lives as they learn to live with chronic pain. Peterson and la Cour (2016) evaluated the purposefulness and effectiveness of MBSR. The scope was quantitative and included data collection from 58 persons followed for six months (Petersen & la Cour, 2016). The rationale for the study was to evaluate and predict the effectiveness of MBSR, the benefits, and conditions, or timing for optimal benefit. The hypothesis was that MBSR would have a positive effect and be associated with older age, female sex, higher formal education, shorter duration of pain and opioid treatment, employed work status, and married marital status would affect the effectiveness of MBSR (Petersen & la Cour, 2016).

Mehl-Madrona, Mainguy, and Plummer (2016) aimed to gather information and statistical values to the alternative use of exercise, yoga, or cognitive behavior techniques to promote the decrease in the use of opiates to control lower back pain. The scope of the study included two groups that either conducted group therapy, an hour of exercise

weekly, and had regular follow-up visits vs. patients not willing to seek alternative therapy or group therapy (Mehl-Madrona et al., 2016). The rationale of the study was to demonstrate that the use of opioids did not control the diagnosis of low back pain, and the need to incorporate alternative therapy to help decrease opioid dependency. The hypothesis incorporates the statement, complementary and alternative medicine therapies are effective in the decrease of opioid use while managing long-term back pain (Mehl-Madrona et al., 2016).

In summary, the fourth theme, non-pharmacological treatment of chronic pain, and the subthemes supported the use of cognitive behavior therapy and alternative modalities of care. While the level of the pain the person was experiencing was still rated the same, the ability to find self-relaxation through mind exercises, deep breathing of exercise, distracted the individual, allowed for increased coping, and decreased opioid use. The use of alternative treatment modalities including exercise, cognitive behavior therapy, and relaxation has been proven effective in behavior modification.

Diversion of medicine. The diversion of medications includes patients seeking early refills, use of a friend or family member's prescriptions, or buying the medication on the street (Webster, 2005). Aberrant behaviors can be recognized in-clinic visits with formal screening (Webster, 2005). Patients' unable to full fill their opioid need via prescription medications, turn to illicit drugs such as heroin (Higgins, 2019).

***Opioid medication*.** Persons in Kentucky have reverted to heroin from prescription opiates due to the restriction and difficulty to obtain prescription opioids (Victor, Walker, Cole, & Logan, 2017). The study aimed to examine self-reported drug misuse trends among clients entering state-funded substance misuse treatment from 2010 to 2013. An evaluation was also made to assess the result of individuals living in

Kentucky (Victor et al., 2017). The scope was designed by interviewing individuals participating in a state-funded rehabilitation program. Legislation invoked policies to mandate provider and pharmacy reporting of opioid prescription or dispersion. The hypothesis for the study was that, due to the constraints on prescription opioids, residents were turning to illicit drugs (Victor et al., 2017). Key concepts discussed the results of how when a decrease in opioid or benzodiazepine prescriptions were reported, an increase in the use of heroin is noted. The use of the prescriptive drug monitoring program (PDMP) has increased by providers before prescribing narcotics. This supports the DPI project as the PDMP was a source that allowed providers to access and assess whether the patient is seeking and receiving additional narcotics from other providers.

Prevention and treatment of opioid misuse and addiction. Opioid drugs are among the most powerful and effective medications for pain, but also among the most addictive (Volkow, Jones, Einstein, & Wargo, 2019). The opioid crisis was triggered by over-prescription. The overuse facilitated their diversion and misuse and has expanded to heroin and illicit synthetic opioids (Volkow et al., 2019). Alternative medications to treat OUD (methadone hydrochloride, buprenorphine, and naltrexone hydrochloride), are underused, therefore, the risk of relapse is high (Volkow et al., 2019). Strategies to expand medication use and treatment retention include greater involvement of health care professionals (including psychiatrists) and approaches to address comorbidities (Volkow et al., 2019). The high prevalence of depression and suicide among patients with OUD, if untreated, contributes to relapse and increases the risk of overdose fatalities (Volkow et al., 2019). Preventative interventions include screening and early detection of psychiatric disorders. Improving opioid prescription practices for pain management was determined to be important for addressing the opioid crisis (Volkow et al., 2019). Strategies to

expand access to medication for OUD and improve treatment retention have included an increase in the active involvement of psychiatrists, focusing on comorbidities, preventing fatalities, and achieving remission (Volkow et al., 2019). This article supported the DPI project by discussing the effects of overprescribing, the need to assess, and the risk of fatalities that occur because of not having proper screening tools.

There is a commonality of overuse of opioids, chronic pain, and the comorbidity of anxiety and depression. The aim of this study was to review the symptomology of overuse disorder, comorbidity of anxiety, and depression (Miguel, 2005). Practicing in an interdisciplinary manner, a comprehensive pain management program was associated with best practices and best outcomes based on the findings of the review. The scope of the research recognized that pain specialists are not specialists in psychiatry as well (Miguel, 2005). Pain physicians should recognize that comorbid conditions are common in pain patients and affect pain treatment negatively (Miguel, 2005).

The understanding of the extent to which medication adherence was related to the diversion of prescription analgesics was not known (Arria, Garnier-Dykstra, Caldeira, Vincent, & O'Grady, 2011). This study aimed to evaluate individuals prescribed an opioid analgesic as to whether they overused or underused the medication and the potential to divert the medication. Evaluation of patients and the likelihood of diversion was designed to help providers in their prescription practice (Arria et al., 2011). The scope of the practice included first-year college students prescribed an opioid analgesic, between the ages of 21 to 26. The research design was cross-sectional analyses. The rationale of the study was to evaluate the likelihood of diversion of opiate medication, whether due to underuse or overuse. The hypothesis was designed around two competing inquiries. First, individuals who skip doses are at the greatest risk for diversion because

they have leftover medication. Second, individuals who over-use their prescriptions are at the greatest risk for diversion, perhaps because of a general propensity to engage in deviant behavior (Arria et al., 2011). The first part of the hypothesis was null, but the second part was validated. Key concepts included prescription analgesics, diversion, medication adherence, opioids, young adults. A literature review was completed; a cross-sectional analysis data review was utilized to complete the study that lasted for seven years (Arria et al., 2011).

In summary, the fifth theme, diversion of medicine, was supported by the subthemes. The discussion of the return to heroin is increasing due to the restrictions being placed on opioid medications. Medication assistant programs have some success, however, with the expense and lack of coverage by state assistance, relapse is high. Screening for psychiatric disorders can assist in ineffective treatment. Webster's ORT is effective, easy to administer, and interpret. The weakness in the literature was comorbidities are not being treated simultaneously and the use of the state monitoring system could also be utilized with more efficiency.

Chronic polysubstance use disorder. Chronic polysubstance use disorder (PSUD) is associated with cognitive impairments (Hagen, Sømhovd, Hesse, Arnevik, & Erga, 2019). The patient's quality of life, occupational functioning, and the benefits of therapy are all affected. Psychological distress affects neurocognitive status, resulting in impaired neurocognition characteristics indicative of several psychiatric conditions (Hagen et al., 2019). Neurocognitive assessment is important but faces several interpretive challenges, including disentangling psychological distress and cognitive impairment (Hagen et al., 2019). The Montreal cognitive assessment (MoCA) is a measure of cognitive impairment that is independent of psychological distress, as

measured with the symptom checklist revised (SCL-90-R), whereas the behavior rating inventory of executive function-adult (BRIEF-A) is strongly associated with distress. Performance-based assessment can reduce the impact of psychological distress through screening (Hagen et al., 2019).

Alcohol. Alcohol use disorder (AUD) and chronic pain are widespread and an extensive public health burden. Pain is a subjective experience and is essential for survival in an acute phase. In a chronic form, pain is a disorder that negatively impacts quality of life (Maleki, Tahaney, Thompson, & Oscar-Berman, 2019). Neural substrates responsible for the initiation and maintaining chronic pain include dysfunction in descending pain pathways and reward network circuitry (Maleki et al., 2019). Alcohol use disorder involves preoccupation, craving, intoxication, withdrawal, and negative affect (Maleki et al., 2019). Neural substrates of AUD affect the mesocorticolimbic and cerebrocerebellar networks. The prefrontal cortex is impaired as the extended reward and oversight circuitry is affected (Maleki et al., 2019). The interrelationship between chronic pain and AUD has etiological influences, mental experiences, and neurobiological processes (Maleki et al., 2019). Recognitions between the brain and behavioral abnormalities in AUD and the precipitation of chronic pain allows for early detection and treatment.

The distinct subgroup of 12-20-year-old studied, that have had the use of alcohol before the age of 21, can lead to the use of illicit drugs, whether prescription or illegal (Parker, 2019). The age group, sex, and period of use are broken into three subgroups. The aim of this study includes the observation of young teens, young adults consuming alcohol before the age of 21, leads to the use of prescription medication inappropriately, with the chance of heroin use and addiction to follow (Parker, 2019). The scope of the

article includes subgroups, economic classes, nationally represented cross-sectional surveys of individuals not institutionalized across the United States. The rationale for the study is to address the idea that alcohol involvement leads to extra medical prescription pain reliever (PPR) use and more serious involvement among adolescents and young adults (Parker, 2019). The hypothesis is aimed to identify subgroups o individuals with newly incident extra medical use by focusing on the array of extra medical PPR us and the complex relationship between alcohol and extra medical PPR involvement (Parker, 2019). Keywords noted include opioids, adolescents, alcohol, dependence, and persistence. A literature review includes a cross-sectional group of participants, at peak risk of first extra-medical PPR use. Opioid dependence transition was noted in the first year after the onset of such use (Parker, 2019).

Chronic pain (CP) and opioid use disorder (OUD) have remained challenging, complex public health concerns (Speed, Parekh, Coe, & Antoine, 2018). An updated review of the relationship between chronic pain, OUD, and the use of care models for the management of this vulnerable population was performed (Speed et al., 2018). Evidenced-based data were available on the feasibility, implementation, and efficacy of care models in primary care settings for the management of CP and opioid use (Speed et al., 2018). The weakness of the study related to the researchers not enrolling patients with OUD (Speed et al., 2018). Further research was recommended on the etiology and impact of CP and OUD. The articles supported the DPI project as the authors called for the continued research in the correlation between opioid use and chronic pain.

A multivariate logistic regression model revealed 25% of the individuals participating in the study had prescriptions for benzodiazepine and opioid prescriptions in the same year. Anxiety disorder, with a 95% confidence level, p-value <0.001, and PTSD

(95% confidence level, *p*-value 0.019) had the highest prescription for the combination of opiate and benzodiazepine medication. The use of this combination of medications was responsible for increased incidents, resulting in emergency hospitalization or care (Yarborough et al., 2019).

Benzodiazepine. The use of opioid medication in correlation with benzodiazepine medication showed an increase in the use of illicit drugs in one study (Yarborough et al., 2019). The restrictions for opioid prescription have led to providers no longer wanting to prescribe opioid medication for individuals with chronic pain (Yarborough et al., 2019). The increase in opioid tolerance leads the individual to search for the same euphoric state that was produced when the medication was first taken (Yarborough et al., 2019). Medication assistance treatment (MAT) is not successful in treating OUD as the sole treatment modality (Yarborough et al., 2019). The anxiety and depression diagnoses accompany chronic pain (Yarborough et al., 2019). The MAT does not show success until additional care modalities are added to the plan of care (Yarborough et al., 2019). The risk for diversion is noted in patients who do not take their medication as prescribed (Yarborough et al., 2019). Individuals overusing opioids have a higher risk of deviant behaviors (Yarborough et al., 2019). Proper screening for anxiety, depression, and addictive behaviors is possible with the use of Webster's ORT tool (Webster, 2005). The importance of the screening is noted in patients with chronic lower back pain (Higgins, 2019). Frequently the patient is already taking a long-term opiate before having surgery. Physical therapy (PT), CBT, and regular screening for depression and anxiety were shown to enhance and improve surgical outcomes (Yarborough et al., 2019).

In summary, the sixth theme, chronic polysubstance use disorder, and the subthemes discussed the correlation of the use of alcohol, benzodiazepines, and other

illicit drugs as pharmacological gateways that potentiate one another. Regular use causes the patient to seek out additional medications as tolerance, if developed, can lead to diversion and aberrant behaviors. The use of Webster's ORT for screening can provide the patient with the best plan of care and safe tapering off medication.

Chronic pain. The American Chronic Pain Association describes chronic pain as pain that lasts longer than an episode of acute illness or injury should take and affects the overall well-being of the patient (ACPA, 2018). Educational tools that describe the location of the pain, what activity affects the patient's pain, and how a medication is meant to work, are useful in the assessment of medication expectations and patient's overall goals (ACPA, 2018). A complete assessment of the patient's pain is recommended to ensure the quality of life (ACPA, 2018).

Musculoskeletal pain. The effects of long-term pain management using opioids alone do not change the level of pain; instead, multiple didactics of therapy must be utilized, screening for depression and other psychiatric issues (Mehalick, McPherson, Schmaling, Blume, & Magnan, 2016). The study aimed to find a database that provides accurate information on whether the use of opioids and non-opioid medication is the best practice in the management of lower back pain (Mehalick et al., 2016). The scope included the use of opioids and non-opioids across six months and determined how the patterns of use change or were adjusted concerning patient-report pain scores. The rationale was to determine best practices and recognize the effects of opioids vs. non-opioid medication on lower back pain. The study hypothesized that a combination of opioids and non-opioids would produce greater pain relief than just the use of opioids. The study had a secondary hypothesis that stated the prescription strength of the

medication would increase over time as well due to a tolerance to the opioid (Mehalick et al., 2016).

The diagnosis of low back pain (LBP) and the use of narcotics are increased with patients before surgery and when followed for a year afterward (Mehalick et al., 2016). Persons having spinal fusion continue to increase prescription use versus individuals who do not undergo fusion of vertebrae (Stratton, 2018). The study aimed to evaluate whether orthopedic surgeons had a role in the ability to decrease the use of narcotics in presurgical patients. The scope of the study included individuals with radiculopathy, chronic lower back pain that filled medication scripts (Stratton, 2018). The cost of medication, hospitalization, doctor office visits, outpatient services were studied as well. The hypothesis stated the economic burden of LBP patients is significant, and medical resource utilization and costs are greater for LBP patients who undergo 1-2 level lumbar fusion (Stratton, 2018). The study design was a retrospective cohort analysis based on claims data of outpatient pharmaceutical prescriptions from privately insured patients (Stratton, 2018).

Illicit substance use in US adults with chronic lower back pain. Prescription opioids are widely used for chronic lower back pain (cLBP) (Shmagel, Krebs, Ensrud, & Foley, 2016). Concerns regarding opioid prescribing habits, the addictive potential, misuse, and accidental overdose have raised a call for improved monitoring and screening (Shmagel et al., 2016). This study aimed to show to what extent patients with cLBP have a history of illicit drug use and are associated with prescription opiate misuse (Shmagel et al., 2016). It was expressed in the article that cLBP was associated with higher odds of using marijuana, cocaine, heroin, and methamphetamine (Shmagel et al., 2016). The article was pertinent for the DPI project as prescription opioid analgesic use

was more common in cLBP sufferers with a history of illicit drug use. The support for screening for illicit and addictive behaviors can prevent OUD. Opioid medication is not the best choice of medication for patients experiencing lower back pain or other chronic pain. The combination of opioids and non-opioid has shown the best outcome for pain satisfaction. The impairment of solely using opioid medication relates to tolerance. The literature repeatedly discussed the need for screening for anxiety, depression, and addictive tendencies before the administration of opioid medication.

Opioid use disorder assessment tools and drug screening. Opioid use disorder risk assessment tools cannot be used in isolation. The combination of clinical examination, urine drug screening, and a validated risk assessment tool improves the ability to detect opioid misuse (Ducharme & Moore, 2019). A single tool has not been shown to have both high reliability and high sensitivity (Ducharme & Moore, 2019). A global approach to risk assessment, in addition to reviewing the available tools, helps when interacting with patients who may suffer from a substance use disorder (Ducharme & Moore, 2019). Screening for illicit drug use can often result in a confrontational and emotional situation. It may be stressful for both the caregiver and the patient. Minimizing such an emotional response and avoiding escalation of situations are critical in providing compassionate and optimal care (Ducharme & Moore, 2019). This article supported the need for having a screening tool that provides needed information, without placing the patient in a position where they no longer want to have an open and honest relationship for treatment.

Prescription drug abuse and diversion behavior are sustained by the overprescribing of abuse-liable substances. Individuals who intend to abuse or divert prescriptions can feign symptoms easily and effectively (Ramachandran, Rosenthal,

Young, Holmes, & Bentley, 2019). Efforts to identify this behavior are lacking. Most drug abuse screening tools and self-reported symptom inventories are known to have poor sensitivities to faking (Ramachandran et al., 2019). Subtlety in scale development is the degree to which an item can be determined discreetly. Scales containing subtle items, such as the Minnesota Multiphasic Personality Inventory and the Substance Abuse Subtle Screening Inventory, show only moderate sensitivity (Ramachandran et al., 2019). The article supported well-developed subtle scales that can present opportunities to reduce overprescribing, over-diagnosis, and help in the early identification of abuse behavior for targeted interventions (Ramachandran et al., 2019). This supported the DPI by demonstrating how screening for diversion, addictive behaviors, and overuse will prevent fatalities and prescribing opioids for patients at-risk for OUD.

While adolescents were not included in the improvement project, adolescence is a period of vulnerability for developing addictions that can carry over into adulthood. The latest National Survey on Drug Use and Health reported that in 2016, about 3.4% of adolescents reported that they smoked cigarettes, 9.2% used alcohol, and 7.9% used illicit drugs (Palmer, Karakus, & Mark, 2019). Misuse of alcohol and drugs can result in immediate poorer health. An increased risk of unintentional injury, homicide, and suicide, which together are the leading three causes of death in adolescents and young adults (Palmer et al., 2019). Screening, brief intervention, and referral to treatment (SBIRT) are defined by the Substance Abuse and Mental Health Services Administration as an evidence-based practice used to identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and illicit drugs (Palmer et al., 2019). This article demonstrated how SBIRT is not a scan for dependency, yet it can uncover substance

dependence and help a provider or counselor refer those patients to treatment (Palmer et al., 2019).

Pain assessment tools. Webster's Opioid Risk Tool (ORT) is a commonly used measure of the risk of aberrant drug-related behaviors in patients with chronic pain prescribed opioid therapy (Cheatle, Compton, Dhingra, Wasser, & O'Brien, 2019). Webster's ORT was evaluated in a unique cohort of patients with chronic nonmalignant pain (CNMP) (Cheatle et al., 2019). The assessment of patients who displayed no evidence of developing an opioid use disorder (OUD) and a sample of patients with CNMP who developed an OUD after commencing opioid therapy was evaluated using Webster's ORT (Cheatle et al., 2019). The revised Webster's ORT is the first tool developed on a unique cohort to predict the risk of developing an OUD in patients with CNMP receiving opioid therapy as opposed to aberrant drug-related behaviors that can reflect several other issues (Cheatle et al., 2019). The revised Webster's ORT has clinical usefulness in providing clinicians a simple, validated method to rapidly screen for the risk of developing OUD in patients on or being considered for opioid therapy (Cheatle et al., 2019).

Webster's ORT is divided into six questions that focus on pain, depression, anxiety, and ability to function daily module. The different sections all help define a patient's pain experience (Webster & Webster, 2005). The focus of this modification is to assess patients for signs and symptoms of opioid misuse and illegal activities before writing the first prescription for opioids (Webster & Webster, 2005). Webster's ORT was determined to be useful for the DPI project as it screens for trauma, anxiety, and depression, all aspects that have been found to exacerbate pain and increase the risk of OUD.

In summary, the seventh theme, chronic pain, and the subthemes of musculoskeletal pain, low back pain, illicit substance use in low back pain, and tools for pain /opioid use, recognize the difficulty in accurately diagnosing the patient with low back pain. When imaging does not match clinical presentation, the severity of pain may lead to the use of illicit drugs. Formal screening with opioid assessment tools offers an insight into the patient's mental health that affect the increased report of pain.

Summary

Screening with Webster's ORT for addictive behaviors, anxiety, depression, and PTSD supported the call for improvement in the opioid prescription problem engulfing the United States (Webster & Webster, 2005). Opioid abuse is a national healthcare crisis and affects the general population (CDC, 2020). Mismanagement of chronic pain therapeutics has led to severe opioid misuse and inappropriate writing of prescriptions for the opioid medication (CDC, 2020). Addictive behaviors and mental illness, in combination with an opioid prescription, can lead the patient into OUD. Miguel (2005) stated the commonality of overuse of opioids, chronic pain, and the comorbidity of anxiety and depression is a chronic issue. The prevalence of medication misuse in primary care and the characteristics of patients who misuse opioids require proper identification (Tong et al., 2019). The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in central Indiana over four-weeks.

While multiple screening tools were available at the time of this project, the complete screening for all at-risk behaviors was not prevalent in each assessment tool.

However, Webster's ORT offered a complete screening that was easy to administer, readily available, and easy to compute into a risk factor (Webster & Webster, 2005). The reality of best practice is possible when providers recognize an opioid prescription could cause harm to the patient who is demonstrating high scores for anxiety, depression, and PTSD (Webster & Webster, 2005).

The theoretical foundations of the DPI were B. F Skinner's behaviorist theory, Bandura's social cognitive theory, and Dorothea Orem's self-care deficit theory. The basis for choosing these theories related to the understanding that stress, trauma, and environmental issues can cause anxiety and PTSD (Butts & Rich, 2013). Patients with maladaptive capabilities will often reach out for chemical support (Butts & Rich, 2013). The understanding of how behaviors are learned can assist therapists and providers in assisting patients adjust and develop positive habits. Orem's theory discusses how nurses need to recognize at what stage the patient is in and work towards independence in self-care (Irshad 2018).

These theoretical foundations and the literature review were used to support the development of this DPI project. The project used a quantitative methodology with a quasi-experimental design to assess the impact of the independent variable on the dependent variable. The independent variable was the implementation of Webster's ORT (see Appendix B). The dependent variable was the rate of opioid prescriptions for acute pain at an occupational care clinic in Indiana. This was measured over four weeks using practitioner reports and completed Webster's ORT tools.

Chapter 3 presents the research design and methodology, data collection, and analysis procedures. Chapter 4 presents the results of the data analysis. Chapter 5 provides an interpretation of the results.

Chapter 3: Methodology

Opioid abuse is a national healthcare crisis and affects the general population (CDC, 2020). Mismanagement of chronic pain has led to severe opioid misuse and the inappropriate writing of prescriptions (CDC, 2020). The focus of the DPI project was to implement and educate providers on the use of the assessment tool, Webster's ORT, to reduce the opioid prescription rate. The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in central Indiana over four-weeks.

This chapter presents the methodology and design of the project. Included is a discussion of the population and sample selection. Then, the sources of data and the validity and reliability of the data sources and Webster's ORT are discussed. Then, data collection and analysis procedures are described in detail. The chapter ends with a discussion of bias mitigation, ethical procedures, and project limitations.

Statement of the Problem

It was not known if or to what degree the implementation of Webster's Opioid Risk Tool would impact the opioid prescription rate among healthcare providers in an occupational health care clinic in central Indiana over four weeks. Pain is exacerbated by stress (Okkersen et al., 2018). Individuals with acute pain were determined to be at-risk for opioid abuse in prior literature (Higgins, 2019). The high number of opioid prescriptions has been associated with opioid use disorder and reducing the number of prescriptions is a goal of the surgeon general to reduce addiction (Cicero & Ellis, 2017).

The researchers noted that the use of an opioid assessment tool administered by primary care providers significantly predicted future opioid use disorder diagnoses (Weiner, Horton, Green, & Butler, 2016). Webster's ORT opioid assessment tool provides the healthcare provider with a series of questions that identify addictive tendencies or mental health concerns without being intrusive or threatening towards the patient (Webster & Webster, 2005). This DPI project aimed to reduce the opioid prescription rate among healthcare providers in an occupational health clinic in central Indiana and thereby reduce the potential for future diagnoses of opioid use disorder among the patient population.

Clinical Question

The clinical question for this DPI project was:

Q: Does the implementation of Webster's ORT opioid assessment tool impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks?

This DPI project aimed to decrease the opioid prescription rate and promote referrals for mental health care or social services. Occupational healthcare providers are uniquely positioned to help reduce opioid use disorder by identifying individuals with a likelihood for abuse and refer those patients to alternative therapies (Higgins, 2019).

The independent variable was the implementation of Webster's ORT opioid assessment tool, and the dependent variable was the opioid prescription rate. Data for the dependent variable (opiate prescription rate) were collected pre- and post-intervention from within a group of participating providers. The effectiveness of Webster's ORT predicting the risk of a patient developing an opioid misuse disorder was the aim of the DPI project.

Using a within-group sample of providers, a pre- and post-intervention was conducted. Providers noted the number of opioid prescriptions written for patients complaining of acute pain postindustrial accident. They then received an educational intervention that included Webster's ORT. For four weeks post-implementation, the same providers evaluated their prescribing habits of opioids for patients with acute pain. The interventional tool, Webster's ORT, was used to assist the providers in evaluating whether patients were at-risk for an opioid use disorder and would benefit from a referral for additional care services versus starting an opioid medication.

Project Methodology

A quantitative methodology was deemed appropriate for this project. A quantitative method was based on nominal data that has a terminal end (Wilson, 2020). The outcomes are objective, measurable, and can relate to other persons or populations (Wilson, 2020). Quantitative methods are used to measure the change in a dependent variable attributable to an independent variable (Polit & Beck, 2017). Due to the emphasis in the clinical question on numerical data, the rate of opioid prescriptions pre- and post-intervention, a quantitative method was useful for this project. Determining causality was necessary, and inferential statistics were used to prove findings to a scientific degree (Leedy et al., 2019). The data were collected using Webster's ORT screening assessment tool. Webster's ORT collects objective data and ranks it from low to high predictability (Webster, & Webster, 2005). The quantitative quasi-experimental design was most appropriate for this type of DPI project due to the lack of feasibility or ethical concerns of requesting access to the patient's medical record.

Alternately, a qualitative method could have been used. A qualitative project focuses on the subject's personnel or lived experiences, assesses a culture or group of

people, and has a theory that is derived after the utilization of a research problem (Wilson, 2020). The quantitative method was chosen, however, as there was not a specific group or culture OUD solely focuses on or does not affect. Additionally, the use of an independent and dependent variable allowed for the assessment of correlational identities and a cause and effect if the variables were manipulated (Wilson, 2020).

Project Design

A quasi-experimental design was selected for this project. This allowed for the use of inferential statistical procedures to examine the impact of implementing Webster's ORT (independent variable) would impact the opioid prescription rate (dependent variable) among healthcare providers in a primary care clinic (Polit & Beck, 2017). A quasi-experimental design involves the use of non-random samples in a controlled environment to measure a change in a dependent variable. A convenience sample of the patients treated at an occupational health care facility participated in the DPI project. A convenience sample is derived from a non-probability sampling of individuals that meet the inclusion criteria and can be included efficiently (Leedy et al., 2019). A simple regression test showed how a change in the dependent variable affected the outcome variable (Minnesota, 2020).

Other tests included the independent *t*-test and analysis of variance (ANOVA). These statistical tests assess and look for the difference between the means of variables (Minnesota, 2020). The feasibility of these two styles relates to the purpose of the DPI. The DPI was not assessing the mean value of the opiate prescription rate. It was assessing the relationship of the use (or lack of) use of an assessment tool and the rate of opioid prescriptions as a result. Non-parametric tests were not selected as the outcome data were dependent on the median rather than the mean (Sylvia, 2014).

Parametric statistics utilize interval and ratio-level variables, are based on assumptions, and have a normal distribution (Sylvia, 2014). The independent and dependent variables of the DPI were not fractional. A simple regression test was implemented to assess the change in the independent and dependent variable.

Data for the dependent variable, opioid prescription rate, were collected pre- and post-intervention from each of the providers using completed Webster's ORT sheets. The opioid prescription rate was calculated as the ratio of opioid prescriptions for patients with acute pain from an industrial accident, pre- and post-implementation of Webster's ORT. These data were then compared using a Chi-square test to determine the impact of the independent variable, the implementation of Webster's ORT, on the dependent variable.

Population and Sample Selection

The setting of this DPI project was an occupational health care clinic in Indiana with the participation of patients being treated for acute pain from industrial accidents, staff, and the providers employed by the clinic. The only inclusion criteria for participants where they must be a provider who had federal permission to prescribe opioids at the occupational health care facility in central Indiana. Participation was voluntary. Participants were not be required to sign an informed consent because the general clinic consent for treatment acknowledged the patient would be required to fill out forms required by the clinic for treatment purposes. The providers practiced and conducted this project ethically and did not speak to other providers about their outcomes. The collection of personally identifiable information regarding the identification of the providers nor the patients was not necessary for this DPI project.

The patient sample included 46 patients between the ages of 18 to 99 years of age. The patients had acute pain because of industrial accidents. There was not a randomization requirement for sex, age, or education level. The only limiting factor that excluded patients from being a part of the DPI was if they currently carried a diagnosis of chronic long-term pain and received a narcotic for long-term use.

The initial phase of pretesting incorporated the treatment plan for patients with acute pain, related to industrial accidents. In phase two, the providers received information about Webster's ORT and how it could benefit patients by helping prevent opioid use disorder. Throughout the next four-weeks, an accurate account of patients treated for acute injuries were documented by the providers. The providers documented on Webster's ORT the total score and whether the patient received an opioid prescription. The statistical data were gathered upon completion of the four-week timeframe. Ethical concerns were related to the participating providers accurately reporting their prescription data.

The data were secured in a locked filing cabinet at the clinical site. The cabinet was in the senior manager's office, which also was locked when the provider was not at the clinic. The senior provider was the only person at the clinic with the key to the office. The data were extracted from the computer and placed on a portable device that was secured with Webster's ORT forms. All data will be burned at the end of the three-year holding period per Grand Canyon University Institutional Review Board (IRB) requirements.

Instrumentation

Webster's ORT scores, along with the report of additional care modalities, and medication prescriptions provided the data for the DPI project. Webster's ORT is

composed of six questions (see Appendix B). The questions assess the patient about family history of substance abuse, personnel history of substance abuse, age of the patient, history of preadolescent sexual abuse, and psychological diagnosis (Webster & Webster, 2005).

Dr. Lynn R. Webster and Rebecca M. Webster (2005) developed the ORT to provide providers with a brief screening tool that would predict patients at risk for developing opioid use disorder if prescribed opioid medication for chronic. Aberrant related behaviors are frequently noted in patients misusing opioids (Webster & Webster, 2005). These behaviors include the request for early refills, loss of medication through accidental destruction or theft, and intentional overuse (abuse) of the narcotic (Webster, & Webster, 2005).

The initial validation of Webster's ORT was produced through a study that incorporated patients new to a pain clinic (Webster & Webster, 2005). The period of the patient data ranged over 15 months. Webster's ORT was self-administered and focused on family and self-addiction to a legal or illegal substance, alcohol use, sexual abuse before adolescents, mental disorder, and age (Webster & Webster, 2005). The areas chosen to focus on were related to the personal clinical of experience Dr. L. Webster (Webster & Webster, 2005).

Patients were grouped into three separate categories, dependent on their score (Webster & Webster, 2005). Scores were related to the extreme likeliness to misuse opioids, moderate potential for misuse, and minimal risk (Webster & Webster, 2005). Dr. Webster documented aberrant behavior over 12 months. The prevention of bias for documenting aberrant behavior was documented by the care team of the pain clinic, not solely Dr. Webster (Webster & Webster, 2005).

The purpose of Webster's ORT was to screen for chronic pain, anxiety, depression, and addictive tendencies. The reliability of the assessment tool correlated with the honesty of the patient (Webster & Webster, 2005). Patients offering false information skew the output of the "at-risk" score (Webster & Webster, 2005). The questions are scored for females and males, respectively. Males with a positive response for alcohol and illegal drugs are scored higher versus females answering with a positive response. Females are scored higher for positive responses relating to pre-adolescent sexual abuse versus males. All other categories of Webster's ORT are scored with the same value between males and females (Webster & Webster, 2005). Scores range from 3 to 8. A score of 3 or less indicates minimal risk, 4 to 7 indicates moderate risk, and a score of 8 or more is indicative of elevated risk (Webster & Webster, 2005).

Validity

Validity results from a measurement measuring what it is was intended to measure (Sylvia, 2014). Webster's ORT has been tested extensively and validated through peer-reviewed articles (Lawrence et al., 2017). The databases CINAHL, Medline, Cochrane Library, PsycINFO, and PubMed were utilized in the search by Lawrence et al. (2017). Inclusionary data were studies that were systematic reviews, controlled trials, clinical interviews for use of prescribed pain medication, structured interviews, the use of drug screening, and adult patients (Webster, 2005, Lawrence et al., 2017). Webster's ORT was one of seven assessment tools identified and discussed in 17 studies (Lawrence et al., 2017). Webster's ORT was developed utilizing the literature, evaluating opioid misuse, and the ability for clinicians to recognize and evaluate the risk of OUD related behaviors in patients taking chronic opioid medications, or seeking opioids for chronic pain (Lawrence, 2017).

Convergent validity was significant at $p < 0.01$ (Lawrence et al., 2017). The qualities measured included substance abuse potential, disability, and psychosocial distress (Lawrence et al., 2017). Webster's ORT achieves construct validity by assigning a score post-administration. Convergence occurs due to the option for providers to utilize multiple other assessment tools as well as theoretical evidence (Heale & Twycross, 2015). Theoretical evidence was appropriate for the social theory and behavior therapy measures anxiety and depression as key factors of chronic pain exacerbation (Lawrence et al., 2017). The rigor of the study that developed Webster's ORT was noted in the extensive literature review and the reliability of Webster's ORT (Lawrence et al., 2017).

Reliability

Reliability is the extent of an instrument to produces the same results in repeated administration (Sylvia, 2014). The reliability of the improvement practice was related to the internal consistency of Webster's ORT. The attributes of reliability are homogeneity, stability, and equivalent (Webster, 2005). Stability is tested using test-retest. Webster's ORT demonstrated reliability after initial testing; six-month follow-up with monitoring of the state's prescription monitoring program demonstrated 94.4% of low-risk patients did not demonstrate aberrant behaviors, whereas 90.9% of high-risk patients did have documented aberrant behaviors (Lawrence et al., 2017). Webster's ORT also showed reliability in a prospective study of 185 patients being initially screened for treatment in a pain management center (Lawrence et al., 2017).

The patient characteristics were not significant between patients completing Webster's ORT or those who did not (Lawrence et al., 2017). A chart review for request of early refills and answers to questions guided by the physician risk assessment supported the evaluation that patients' Webster's ORT scores of greater than 8 were 6.4

more likely to have a diagnosis of opioid use disorder (Lawrence et al., 2017). A sequential logistic regression model proved certain factors and behaviors related to the outcome of high or low Webster's ORT scores (Lawrence et al., 2017).

Parallel-form reliability is like test-retest (Heale & Twycross, 2015). An assessment that still measures pain, anxiety, and depression could be administered, and evaluate the original instrument against the subsequent tests (Heale & Twycross, 2015). A parallel form was not to be conducted for this improvement project. A valid assessment tool alone cannot screen with 100% reliability (Webster & Webster, 2005). Using the assessment tool, in combination with a physical assessment and laboratory testing, resulted in best practice for comprehensive opioid evaluation (Ducharme & Moore, 2019).

Data Collection Procedures

The required documents, including a letter of approval to conduct the improvement project at the occupational health care facility, were submitted to the Grand Canyon University Institutional Review Board (IRB). Approval was received on September 29, 2020 (see Appendix A). Permission was also obtained to use Webster's ORT (see Appendix C). Only after all appropriate permissions were obtained did data collection begin.

The DPI project started with the evaluation of the providers employed at the occupation health care clinic prescribing an opioid after a patient had an industry injury resulting in acute pain. Phase two started with the introduction of social cognitive theory, behaviorist theory, and Webster's ORT during a face-to-face educational session. The educational sessions lasted for two hours and was mandatory for all providers (n = 2).

Immediately after the educational sessions, the implementation of Webster's ORT started with the staff bringing the patient to the examination room and providing the privacy to complete Webster's ORT. The staff ensured the patients did not mark any identifying information on the form and that it was completed in its entirety. The total score from Webster's ORT was documented on the form. During the physical examination, the physician reviewed Webster's ORT with the patient. The provider documented whether they provided an opioid prescription to the patient. Webster's ORT was used to formally screen patients for four weeks.

Upon completion of week 4, Webster's ORT forms were evaluated for the number of patients treated, the number of prescriptions for opioids provided before the implementation of Webster's ORT, and afterward. SPSS 27 produced statistical values for the improvement project. All Webster's ORT forms were secured in a locked filing cabinet inside an office that also locks. The senior managing partner at the project site is the only person with a key to the filing cabinet. Products from the DPI will be held per Grand Canyon University IRB policy and will be destroyed after a three-year period by fire.

Data Analysis Procedures

Data analysis was completed to answer the clinical question: does the implementation of Webster's ORT opioid assessment tool impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks? The data retrieved from the improvement project were collected in the following order. The total number of patients treated for acute pain resulting from an industrial accident was documented and provided a total sum. There were not any identifying markers, including the patient's name, gender, race,

or place of employment, listed on any of the project documents. The dependent variable, opioid prescription rate, was collected pre- and post-intervention from each of the providers. The opioid prescription rate was calculated as the ratio of opioid prescriptions before use of Webster's ORT and after implementation of Webster's ORT for four weeks.

A Chi-square statistic was conducted using SPSS version 27. The purpose of the Chi-square was to determine whether there was a change in the mean opioid prescription rate for the provider's pre- and post-use of Webster's ORT. A Chi-square determines a *p*-value by calculating if the projected data and the observed data are close in value (Schumaker & Lomax, 2010). The Chi-square was statistically significant and demonstrated the project analysis was aligned with the specific project design when the predicted and observed data were equal (Schumaker & Lomax, 2010).

Bias Mitigation

Bias in any research or improvement project can lead to false measurements of data (Sica, 2006). The risk of losing validity in the DPI was related to having the same patient fill the same form out several times in a short amount of time and patients providing false information (Sica, 2006). The readability of the assessment tool must be in the native language of the patient being treated and at a sixth grade reading level (Kumar, 2020). The potential for bias is increased if the patient is not able to understand what is being asked.

Personal bias and beliefs also affect the outcome of studies (Sica, 2006). The staff of the occupational health clinic were asked to reflect on their personnel beliefs about opioids, acknowledging that the goal of the improvement project was to ensure safety for the patient, public, and employer (Higgins, 2019). The decision to implement an

assessment tool that had only five sections, with an average of two questions per section, prevented the patients from circling any answers at a random rate. The patients did not fill in the form with any words, therefore the answers were not open for interpretation. The scoring of Webster's ORT is a guideline, not a fixed rule of whether a patient is eligible for an opioid prescription (Webster & Webster, 2005). A patient's family history of alcohol abuse, illegal drugs, or misuse of prescription drugs does not mean the patient is going to do the same (Webster, & Webster, 2005).

Ethical Considerations

Before data collection, written approval to complete the project was obtained from the Grand Canyon University IRB committee (see Appendix A). Approval was also received from the project site. Permission to use Webster's ORT was sought and received (see Appendix C).

The Belmont Report was created in 1974 with the guidelines to identify the basic ethical principles that are the foundation for conducting research involving human subjects (Office for Human Research Protections [OHRP], 1979). The basic principles are as follows:

- Respect of person. Individuals should be treated as autonomous individuals, capable of deciding to participate or leave a research study at any time. Persons deemed to have decreased autonomy have the right to be protected from harm or unethical research (OHRP, 1979).
- Beneficence. Persons are protected from harm, and efforts are made to secure their wellbeing (OHRP, 1979)
- Justice. The fairness and distribution of the research determine who should receive the benefits, and how bears the burden of the research (OHRP, 1979).

In this project, the principles of the Belmont Report were maintained by the auditing of the review of the completed forms (Polit & Beck, 2017). Each provider and staff member received a pre-project educational session which notified the participants of the purpose, nature, and the potential benefits Webster's ORT offered in the field of occupational medicine. Anonymity was achieved with de-identifiers for patient protected health information. Any data collected were kept secured in a locked filed cabinet, within a locked office, and will remain there for three years post-completion of the improvement project. After three years, the destruction procedures for Webster's ORT forms and the portable storage device will be via fire to ensure the data and HIPAA violations do not occur.

The DPI project involved the minimal risk that one might encounter during a typical patient-provider encounter (Polit & Beck, 2017). The risk of spillage of personnel identification information (PII) was significantly decreased due to the patient not printing their name, age, race, or employer's name on Webster's ORT. This DPI project did not increase the risk to participants any more than the standard of care as the standard was provided for both comparison and intervention groups. No potential conflicts of interest were noted.

Limitations

The amount of time allotted to measure the impact of Webster's ORT on the opioid prescription rate was a limitation. Statistics that support the use of Webster's ORT would benefit from a minimum six-month period of observation (Webster & Webster, 2005). The reduction of the workforce related to COVID-19 may have a limited sample size and affected opioid prescription rates. The longevity of the results will not be

recognized as the time frame for conducting the DPI project did not allow for additional chart reviews of providers participating in the improvement project.

Summary

Opioid abuse is a national healthcare crisis and affects a substantial portion of the general population (CDC, 2020). The responsibility of safe and appropriate opioid prescriptions is an effort that needs to be supported by the provider and the patient (Webster & Webster, 2005). Utilizing the Webster's ORT, the provider and patient can assess whether a short-term opioid could place the patient in an at-risk category and if alternative modalities of care have greater value (Webster & Webster, 2005). The project design ensured patient confidentiality as the patient data were not placed on any of the project forms.

It was not known if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in Indiana over four weeks. The purpose of this quantitative quasi-experimental project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in Indiana over four-weeks. The goal of the DPI project was to demonstrate how the use of Webster's ORT can achieve a level of safety and promote best practice.

A quantitative, quasi-experimental design was used to determine the impact of the independent variable on the dependent variable. The independent variable was the implementation of Webster's ORT (see Appendix B). The dependent variable was the rate of opioid prescriptions for acute pain measured over four weeks. Webster's ORT was

used to measure opioid prescriptions. This tool has both demonstrated validity and reliability (Lawrence et al., 2017).

Forty-six patients exhibiting acute pain from an industrial accident designed the sample population. Inclusion criteria reflected the patients were 18 to 99 years old and injured in an industrial accident. The exclusionary criteria were patients under the age of 18 years old, with a chronic pain diagnosis, or who were receiving a long-term opioid medication. The patient sample included male and female patients. The educational background and ethnicity of the patient were not factored into analysis.

The project was implemented over four weeks. After all appropriate approvals had been received, the providers at the project site provided data on their opioid prescription rates. Education on SCT, behaviorism, and Webster's ORT was next provided to the staff members. Immediately after the education, they implemented Webster's ORT into practice for four weeks. Data was then analyzed using a Chi-square test.

Chapter 4 details participant demographics, data collection issues, and results organized by clinical question. Results are presented in narrative and visual form. Chapter 5 presents the interpretation of the results as well as implications and recommendations.

Chapter 4: Data Analysis and Results

Opioid abuse is a national healthcare crisis that has effects on all demographics of the general population (CDC, 2020). The DPI project aimed to decrease the opioid prescription rate for patients with acute pain who demonstrated an elevated risk for opioid misuse. Occupational health providers are uniquely positioned to help reduce opioid use disorder by identifying individuals with a likelihood for abuse and refer those patients to alternative therapies (Higgins, 2020). The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational healthcare in Indiana over four weeks.

The following clinical question guided this project:

Q. Does the implementation of Webster's ORT opioid assessment tool impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks?

Based on the purpose statement and clinical question for this DPI project, a quantitative methodology was employed. Quantitative methods are used to measure the change in a dependent variable attributable to an independent variable (Polit & Beck, 2017). The quantitative quasi-experimental design was most appropriate for this type of DPI project due to the lack of feasibility or ethical concerns of requesting access to the patient's medical record. The test for cause and effect was possible with the use of a pre- and post-evaluation of the data from the providers participating in the practice improvement project. The use of the quasi-experiment did not require randomized, control, or comparison groups (Leedy et al., 2019). The independent variable was the

implementation of Webster's ORT, and the dependent variable was the opioid prescription rate, which was measured over four weeks using provider reports and the completed Webster's ORTs. The patient population was individuals over the age of 18 to 99 years and who worked in an industrial industry setting in Indiana. The provider population included two licensed physicians and support staff at the occupational health clinic.

This chapter provides the results of data collection and analysis. First, descriptive data was presented. Then, the data analysis procedures are reviewed in detail. Finally, the results and a summary of the results are discussed.

Descriptive Data

Participants of the improvement project were 18 to 99 years old and injured in an industrial accident. The patients under the age of 18 years old or who had a chronic pain diagnosis or were receiving a long-term opioid medication were excluded. The race, education, and gender of the patients were not documented to maintain privacy of patient health information. A total of 46 patients were included in the study, 22 patients were treated pre-intervention (comparative group) and 24 patients were treated for injury post-implementation of Webster's ORT (implementation group). The providers of the clinic were certified to treat in the field of addictive medicine. The background of the senior managing provider included occupational medicine, addictive medicine, and anesthesiology. Table 1 displays the sample size for the comparative and implementation groups.

Table 1

Sample size information for comparative and implementation groups

Variable	Comparative		Implementation	
	n	%	*n*	%
Sample Size	22	47.83%	24	52.17%

Data Analysis Procedures

The collection of the data was completed over four weeks. Data for the patient outcome of opioid prescriptions were extracted from the facility EHR and entered into IBM SPSS version 27 using a unique identifier for each patient (e.g. 1 to 22 for the comparative group and 23 to 46 for the implementation group). The patient outcome of opioid prescription was coded numerically as 1= Yes and 0= No. No patient identifiers were collected or entered into the SPSS dataset. After data entry was complete, errors in data were checked using frequency counts and descriptive statistics (range) to ensure data were accurately recorded. The independent variable was categorical (Webster's ORT implementation) and the dependent variable was categorical (Opioid Prescribed: Yes or No). The most appropriate test to answer the clinical question based on two categorical variables is a non-parametric chi square test. This test is used to analyze group differences when the dependent variable is measured at a nominal level (McHugh, 2013). The level of significance was set to .05, thus, a *p*-value of less than .05 would indicate statistical significance. Regarding validity, the ORT displayed excellent discrimination for both the male (concordance index = 0.82) and the female (concordance index = 0.85) prognostic models (Webster & Webster, 2009). For reliability, patients in a low-risk category had no ADRB's 94% of the time while 91% of those categorized as high risk exhibited ADRBs (Webster & Webster, 2009).

Results

Data analysis was run to answer the clinical question: Does the implementation of an education intervention, including Webster's ORT impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in Indiana over four weeks? The independent variable was the implementation of Webster's ORT, and the dependent variable was the rate of opioid prescriptions measured over four weeks. As shown in Table 2, the chi-square test revealed a statistically significant decline in opioid prescription rates from the comparative (n =22, 100%) to the implementation group (n= 9, 37.5%), X^2 (1, N=46) = 20.40, p = .000. The decline is reflective of improvement, as the aim was to reduce opioid prescriptions. These results suggest that the implementation of Webster's ORT is effective in reducing opioid prescription rates.

Table 2

Chi-square test results for opioid prescription rate

Variable	Comparative (n = 22)		Intervention (n = 24)		X^2	p-value
	n	%	n	%		
Opioid Prescription Rate	22	100	9	37.5	20.40	.000

Figure 1 displays the opioid prescription rate for the comparative and implementation patient groups. The rate for the comparative group was 100% and the rate for the implementation group was 37.5%.

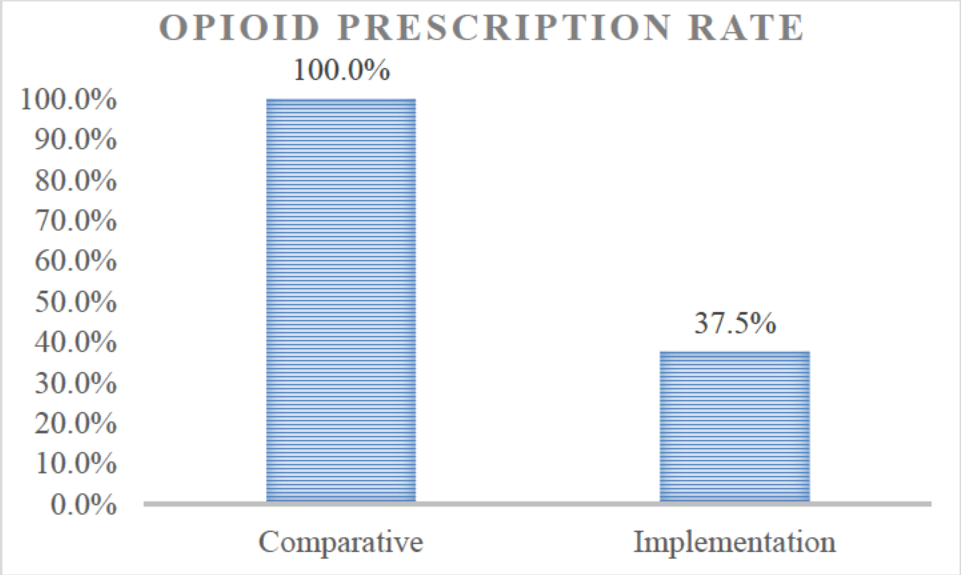

Figure 1. Opioid prescription rate for comparative and implementation groups.

Summary

The clinical question for this project was "Does the implementation of Webster's ORT impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks?" Data on prescription rates were collected for a comparative group of patients (before the implementation of Webster's ORT) and an implementation group. The total sample size was 46 patients, $n = 22$ in the comparative group and $n = 24$ in the implementation group. A chi-square test revealed a statistically significant decline in opioid prescription rates from the comparative (n =22, 100%) to the implementation group (n= 9, 37.5%), X^2 (1, N=46) = 20.40, p = .000. The p-value of less than .05 suggests statistical significance, as the level of significance was set to .05. These results show that the implementation of Webster's ORT is effective in reducing opioid prescription rates. Statistical significance was achieved for the project and clinical significance was also achieved as the opioid prescription rate was reduced, as intended, after the implementation of Webster's ORT.

Chapter 5 provides an interpretation of the findings. It includes a comprehensive summary, explaining the initial question, methodology, project procedure, and statistical outcomes. It ends by describing the implications of the project and recommendations for future projects and practice.

Chapter 5: Summary, Conclusions, and Recommendations

The continued elevation of illicit opioid use and diversion is a concern in the United States (CDC, 2020). The review of the literature provided multiple assessment tools to screen for drug use; however, the gap in literature reflected a lack of knowledge about how to recognize a patient's potential to prevent a patient from developing an opioid addiction. The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of Webster's Opioid Risk Tool (ORT) would impact the number of opioid prescriptions when compared to not formally screening acute pain patients in an occupational health clinic in central Indiana over four-weeks.

The patients being treated in an occupational medicine clinic were the focus of the improvement project. Injuries resulting in lacerations, fractures, or musculoskeletal injuries are frequent in industrial accidents (Higgins, 2019). Pain management of acute injury is important; however, recognizing the potential for the development of opioid addiction is easily attainable with the implementation of an opioid assessment tool (Webster, 2005). Webster's Opioid Risk Tool was the assessment tool of choice for the DPI project.

This chapter included a summary of the project. It next provided a summary of the results and presents the conclusions that can be developed from them. The implications of the results for theory, practice, and the future are discussed. The chapter ends with recommendations for future projects and practice.

Summary of the Project

It was not known if or to what degree the implementation of Webster's ORT would impact the opioid prescription rate among healthcare providers compared to

current practice in an occupational health care clinic in central Indiana over four weeks. The project site did not have a screening tool in place before the project intervention. As demonstrated by the literature, the use of opioids can lead to misuse in patients who demonstrate aberrant behaviors (Webster & Webster, 2005). However, the literature also revealed the implementation of an opioid risk assessment tool to be effective in decreasing opioid prescriptions (Webster & Webster, 2005). In this project, an evidence-based screening tool, Webster's ORT, was implemented into practice for four weeks using a quantitative, quasi-experimental design. These results were compared with pre-intervention prescription data.

In the review of the literature, Webster's ORT was shown to evaluate risk factors in patients that would not have been assessed if the provider had not utilized Webster's ORT or did not have extensive training in behaviors that are indicative of OUD (Webster & Webster, 2005). As noted in the literature, opioid use has many confounding factors, including PTSD, musculoskeletal pain, and mental health issues (Lupien, Juster, Raymond, & Marin, 2018). The research demonstrated there was an increased risk of PTSD, depression, anxiety, and other addictive tendencies that were manifested when an opioid prescription was provided inappropriately (Lupien et al., 2018).

The formal assessment of patients presenting with acute pain has been identified as a crucial step in ensuring the patient does not receive a medication that can cause future harm or misuse (Najavits & Hien, 2013). Opioid medication has a purposeful use in pain management; however, individual screening for anxiety, depression, addictive tendencies, or diversion history needs to be completed to ensure the medication is not improperly used (Webster, L., & Webster, S., 2005). Opioid assessment tools have been

validated to provide accurate aberrant behavior identification (Webster & Webster, 2005).

At the project site, providers received training about Webster's ORT, behaviorism, SCT, and self-care deficit theory from peer reviewed articles demonstrating validity of Webster's ORT and SCT. They then implemented the ORT (independent variable) for four weeks. Data on opioid prescription rates (dependent variable) were then compared pre- and post-implementation of Webster's ORT.

Data analysis was conducted utilizing descriptive statistics and the Chi-square. Results demonstrated the statistical significance Webster's ORT can produce in the process of safe opioid use. The quality improvement project was completed by the implementation of Webster's ORT and by implementing responsible opioid prescribing protocols.

Summary of Findings and Conclusion

Data analysis was performed to answer the clinical question: does the implementation of Webster's ORT impact the opioid prescription rate among healthcare providers compared to current practice in an occupational health care clinic in central Indiana over four weeks? A Chi-square test was used to determine if there was a statistical significance between the dependent variable and independent variable. The results of the Chi-square were a statistically significant decline in opioid prescription rates from the comparative (n =22, 100%) to the implementation group (n= 9, 37.5%), X^2 (1, N=46) = 20.40, p = .000. The importance of this value shows Webster's ORT can prevent opioid misuse in patients with acute pain sustained from an industrial accident in the occupational healthcare setting.

From the data and based on the statistical significance, Webster's ORT did provide accurate screening to determine the appropriateness for patients safe to receive an opioid prescription. Further guidelines were developed to continue the progression of safe opioid prescribing at the project site based on the results. The implementation of regular formal screening, the use of Indiana's prescription drug monitoring program (PDMP), and opioid contracts will be used to continue to reinforce the clinical mission of safe opioid prescribing at the project site.

Implications

The direct improvement project was implemented to determine whether the use of an opioid assessment tool provides safety to patients, recognizing health concerns that could potentially lead to opioid use disorder if prescribed an opioid. The literature review provided guidance and focus for the improvement project, enforcing the thought process that depression, anxiety, and PTSD can facilitate poor outcomes for the patient being provided an opioid prescription. By understanding the implications of mental health and addictive tendencies, providers can offer proper pain management without placing the patient at risk for opioid use disorder. The strength of the project included the complete review of literature that identified a recurring gap. The data were assessed utilizing SPSS 27. A Chi-square provided statistical significance, supporting the use of an opioid assessment tool can identify patients at elevated risk for opioid use disorder.

Practice improvement measures can be developed by understanding the increased effort to maintain patient safety. Staff education is imperative, and patients understanding the purpose of the screening leads to honest answers. Patients with screening results that are deemed high risks will benefit from additional care modalities (occupational therapy, physical therapy, or mental health). Webster's ORT could result in the patient receiving

care for mental health issues the patient and provider did not recognize before the completion of the screening.

Theoretical implications. There were three theoretical frameworks for this project. The first was behaviorism. Behaviorist theory states all behaviors are learned; therefore, if a behavior is learned, it can be unlearned (Skinner, 1976. By applying the behaviorist theory to pain management, the provider can work to help the patient learn to cope with pain. The behaviorist theory was utilized in the education of the clinical staff, providers, and patients. Understanding and validating how a person learns or how their life experiences shape how they assess and manage pain assisted the treatment team at the project site in talking to patients about care options. The understanding of the dynamics of a person's life experiences and how they are related to pain promotes the advancement of evidence-based care regarding the management of pain (Butts & Rich, 2013). The results advance the use of behaviorism for this population by the valid results Webster's ORT provided and related to behavioral issues or addictive tendencies.

The social cognitive theory discusses that individuals learn coping skills by the response they receive after exhibiting a behavior (Bandura, 1986). Patients who have an exaggerated response to a minor injury can have maladaptive coping skills (Butts & Rich, 2013). Patients with PTSD, anxiety, and depression can exhibit fear that may not appear as a logical response to an individual who has not experienced a traumatic event (Lupien et al., 2018).

The difference between the two situations, however, is the fear is real for the patient with PTSD, and the desire to escape and find chemical means to cope can lead to a dependency on opioids, benzodiazepines, or alcohol (Lupien et al., 2018). The social cognitive theory assisted in the provider understanding how the patient processes pain

and provided cueing of how to respond to a patient to help develop a change in how they process and anticipate pain. The SCT has a place in occupational medicine in the future. Providers understanding the theory will have therapeutic conversations with the patient versus the patient feeling judged or attacked if they demonstrate elevated opioid screening scores (Webster & Webster, 2005).

Orem's self-care theory advanced the knowledge of the acute pain patient and the need to completely evaluate the patient's understanding of pain, expectations, and willingness to use alternative pain relief if an opioid prescription is not the best choice for pain control. The staff and providers evaluate the patient on admission and continue to evaluate and change the level of support as the patient progresses through the healing process. The patient can reach independence in wound care through learning how to manage the wound and manage their pain.

Practical implications. Implications from the DPI include the importance of the use of an opioid assessment tool for the screening of patients experiencing an acute injury in need of pain management. The use of Webster's ORT can help prevent patients with underlying mental health issues, addictive tendencies, or diversionary history from receiving a medication that is not safe for their overall wellbeing. The discussion of inappropriate use of alcohol, addictive tendencies, or mental health concerns is often received as threatening or perceived as judgmental (Lupien et al., 2018). Providers can become comfortable addressing issues with practice and using Webster's ORT as a guide to phrase questions. The assurance to the patient that they are in a safe environment and will not be judged for accurate answers may facilitate complete honesty. The overall goal is not to provide mental health therapy in the occupational health setting but to assist in

gaining access to the care needed. As demonstrated in this project, Webster's ORT can help with this process.

Future implications. Future implications include developing an assessment tool that is tailored to the clinic's specific specialties. The scientific advancement that would be attained could demonstrate statistical significance rather than just clinical significance. The opioid crisis in the United States is a strong concern for providers who work with patients demanding pain control when injured (Higgins, 2019). The use of an opioid assessment tool can ensure the safety of the patient and help clearly define the expectations and responsibilities of the patient receiving an opioid by using an opioid contract.

The opioid contract would identify that the state's prescriptive database for opioid prescriptions would be utilized to ensure the patient was not receiving any other controlled substances from other providers. A urine drug screen would confirm there were no illicit drugs in the patients' system at the time of the injury and receipt of an opioid prescription. The contract would further state the prescription is for short-term use only, and a refill would not be authorized. The patient would be required to agree with all terms of the contract to receive the opioid prescription.

Recommendations

Recommendations of the DPI include education in behaviorist theory, social cognitive theory, the effects of PTSD, anxiety, and depression in a patient with acute pain, and the risk of OUD in patients exhibiting these medical concerns. The regular use of an opioid assessment tool in the practice where pain management for an injury is expected ensures a standard of care that is consistent and recognized in the industry (Higgins, 2019). The short amount of time the patient needs to complete Webster's ORT

and the short amount of time needed for the provider to score Webster's ORT is valuable in the best practice for the use of opioids. An honest discussion of elevated scores and the risk the patient could have can be a substantial benefit in the patient's overall mental and physical health. New theories or improved screening tools can benefit the special nature of occupational medicine.

Recommendations for future projects. There are several recommendations for future projects based on these findings. First, future projects should include a comparison of opioid assessment tools in a clinical setting. The design of the project would be to select three separate assessment tools and have patients fill them out at separate times. The length of the form could vary from five questions to 26. The comparison between short- and long-form assessment tools could provide evidence supporting the best opioid assessment tool for an acute care setting.

Second, future projects that could yield a statistical significance plus a clinical significance with a longer project timeframe. Providers would also become comfortable asking questions about mental illness or traumatic events that triggered a high-risk score on the assessment tool. The benefit to the project is patients comfortable in their healthcare setting and do not feel judged about past life events, will speak freely and honestly.

Third, future projects should combine mental health with patients diagnosed with chronic pain that is not supported by imaging. The outcome would be mental health professionals to work with the patient on cognitive behavior therapy, social cognitive theory, and adaptive coping measures. The goal would be the decrease in the use of long-term opioids. Literature supported that anxiety, depression, and PTSD exacerbates a patient's perception of pain (Van Damme et al., 2010). A comparison of a patient's pain

before the implementation of mental health and six months after mental health care would supply the data for the qualitative study.

Finally, future projects should use the design of this project to advance the results and determine if the clinical significance is reproducible in more than one occupational health care clinic. The reproducibility would provide for validity to the clinical question, and provides scientific knowledge by extending an education intervention, including Webster's ORT opioid assessment tool, to a high-risk population for opioid abuse. Randomization of patients into age groups, sex, and educational levels could evaluate and extend the correlational relationship between the variables.

Recommendations for practice. There are several recommendations for future practice. First, all providers should be registered with their state's narcotic monitoring program. The providers utilizing the state monitoring site would ensure patients with high-risk behavior who manipulate the assessment tool are tracked and noted. The benefit of recognizing the morphine equivalents and frequency of opioid prescriptions would assist in proper dose strength if the provider decides to prescribe an opioid.

The education in alternative treatment methods for acute pain would keep the providers up to date with innovative technology and alternative care modalities instead of relying on medication to manage the patient's pain. The different care modalities that are now accepted have shown benefits for pain and are a benefit to patients who are not candidates for an opioid prescription. When providers understand the mechanism of the therapy, they can intelligently discuss it with the patient and have an increased acceptance that the patient will try the therapy.

Formal opioid education through an addictive medicine society would provide current and relevant information about opioids. The complexity of how the brain is

reprogrammed because of opioid use is difficult to understand. By attending educational programs that are specific to opioids and the workforce injury, the provider can ensure the patient achieves pain relief but is not placed at risk for additional injury.

The consistent use of an opioid assessment tool with all patients would provide regular formal screening in at-risk behavior and addictive tendencies (Webster, 2005). The continuation of a specific tool is warranted, or the use of multiple different tools that can provide an evaluation of which tool is most beneficial in assessing the risk factors for the patients. The development of an opioid contract for patients being prescribed a narcotic for acute pain would outline the practice guidelines and the patient's responsibilities. Clear and concise information about safe storage and refill policy could assist in the patient taking the medications as prescribed and provide a basis for determining adherent behaviors during future appointments.

Providers treating patients with acute pain can benefit from the outcomes of this DPI project. The use of assessment tools is easy to implement, and education about the different tools available is beneficial to all levels of staff employed in a clinic. The short-term outcomes and the significance of this project positively affected the patients who were at high-risk for opioid abuse. Potential long-term benefits included healthcare cost savings by reducing mental and physical health issues for an at-risk population. Evidence-based education and assessments are effective in a variety of settings across populations (Cicero & Ellis, 2017; Nichter et al., 2019).

References

Association, A.C. (2018). *Chronic pain.* Retrieved from: https://www.acpa.org

Arbuck, D., & Fleming, A. (2019). Pain assessment: Review of current tools. *Practical Pain Management*. Retrieved from https://www.practicalpainmanagement.com/resource-centers/opioid-prescribing-monitoring/pain-assessment-review-current-tools

Arria, A. M., Garnier-Dykstra, L. M., Caldeira, K. M., Vincent, K. B., & O'Grady, K. E. (2011). Prescription analgesic use among young adults: Adherence to physician instructions and diversion. *Pain Medicine, 12*(6), 898-903. doi:10.1111/j.1526-4637.2011. 01107.x

Bandura, A. (1971). *Social learning theory.* Englewood Cliffs, NJ: Prentice hall.

Bernardy, N., & Montano, M. (2019). Opioid use among individuals with posttraumatic stress disorder. *PTSD Research Quarterly*, *30*, 1-8. Retrieved from https://www.ptsd.va.gov/publications/rq_docs/V30N1.pdf

Butts, J., & Rich, K. (2013). *Philosophies and theories for advanced nursing practice.* Long Beach, MS: Jones & Bartlett Learning.

Centers for Disease Control and Prevention. (2020). *Opoid data and resources.* Retrieved from https://www.cdc.gov/drugoverdose/data/analysis.html

Census Bureau (2019). *Veterans statistics – Texas*. Retrieved from https://www2.census.gov/library/visualizations/2015/ comm/vets/tx-vets.pdf

Cheatle, M. D., Compton, P. A., Dhingra, L., Wasser, T. E., & O'Brien, C. P. (2019). Development of the revised opioid risk tool to predict opioid use disorder in patients with chronic nonmalignant pain. *The Journal of Pain*, *20*(7), 842-851. doi: 10.1016/j.jpain.2019.01.011

Cicero, T. J., & Ellis, M. S. (2017). Understanding the demand side of the prescription opioid epidemic: Does the initial source of opioids matter? *Drug and Alcohol Dependence, 173*, S4-S10.

CINHAL. (2020). *CINHAL complete*. Retrieved from CINHAL: www.ebsco.com

Delhomme, P. (1991). Comparing one's driving with others': assessment of abilities and frequency of offences. Evidence for a superior conformity of self-bias? *Accident Analysis & Prevention, 23*(6), 493-508.

Ducharme, J., & Moore, S. (2019). Opioid use disorder assessment tools and drug screening. *Missouri Medicine, 116*(4), 318-324. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6699803/

Ford, J. D., & Smith, S. F. (2008). Complex posttraumatic stress disorder in trauma-exposed adults receiving public sector outpatient substance abuse disorder treatment. *Addiction Research & Theory, 16*(2), 193-203. doi:10.1080/16066350701615078

Finlay, A.H., (2020). Disparities in access to medications for opioid use disorder in Veteran Health Administration. *Journal Addictive Medicine, 2020.* Advanced online copy.

Fortuna, L. R., Porche, M. V., & Padilla, A. (2018). A treatment development study of a cognitive and mindfulness-based therapy for adolescents with co-occurring post-traumatic stress and substance use disorder. *Psychology and Psychotherapy: Theory, Research and Practice, 91*(1), 42-62. doi:10.1111/papt.12143

Frijling, J., Olff, M., & van Zuiden, M. (2019). Pharmacological prevention of PTSD: Current evidence for clinical practice. *Psychiatric Annals, 49*(7), 307-313. doi:10.3928/00485713-20190604-01

Gligor, L. &. (2020). Patient care approach using nursing theories – comparative analysis of Orem's self-care deficit theory and Henderson's model. *Public Health and Management,* 11-14.

Green, B.L., (2016). A tool for assessing a community's capacity for substance abuse care. *Preventative Chronic Disease, 13,* 160190.

Hagen, E., Sømhovd, M., Hesse, M., Arnevik, E. A., & Erga, A. H. (2019). Measuring cognitive impairment in young adults with polysubstance use disorder with MoCA or BRIEF-A–The significance of psychiatric symptoms. *Journal of Substance Abuse Treatment*, *97*, 21-27. doi: 10.1016/j.jsat.2018.11.010

Hayden, J. (2009). Introduction to health behavior theory. In J. Hayden, *Health belief model* (pp. 173-199). Sudbury: Jones & Bartlett.

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing*, *18*(3), 66-67. doi:10.1136/eb-2015-102129

Higgins, S.A., & Simons, J. (2019). The opioid epidemic and the role of the occupational health nurse. *Workplace Health & Safety*, *67*(1), 36-45. doi:10.1177/216507991879242

Ho, P., & Rosenheck, R. (2018). Substance use disorder among current cancer patients: Rates and correlates nationally in the Department of Veterans Affairs. *Psychosomatics*, *59*(3), 267-276. doi: 10.1016/j.psym.2018.01.003

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1-55

Irshad-Ali, B.H. (2018). Application of Orem self-care deficit theory on psychiatric patient. *Annals of Nursing and Practice, 5*(1), 1093

Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The health belief model as an explanatory framework in communication research: Exploring parallel, serial, and moderated mediation. *Health Communication*, *30*(6), 566-576. doi:10.1080/10410236.2013.873363

Kenton, W. &. (2020, March 22). *What is a t-test?* Retrieved from https//www.investopedia.com

Kumar, G.J. (2020). Quality of patient education materials on safe opioid management in the acute peri-operative period: What do patients find online? *Pain Medicine, 21*(1), 171-175.

Langdon, K. J., Dove, K., & Ramsey, S. (2019). Comorbidity of opioid-related and anxiety-related symptoms and disorders. *Current Opinion in Psychology*, *30*, 17-23. doi: 10.1016/j.copsyc.2018.12.020

Lawrence, R., Mogford, D., & Colvin, L. (2017). Systematic review to determine which validated measurement tools can be used to assess risk of problematic analgesic use in patients with chronic pain. *British Journal of Anesthesia*, *119*(6), 1092-1109.

Leedy, P. D., Ormrod, J. E., & Johnson, L. R. (2019). *Practical research: Planning and design*. New York: Pearson Education.

Lindley, B., Cox, N., & Cochran, G. (2019). Screening tools for detecting problematic opioid use and potential application to community pharmacy practice: A review. *Integrated Pharmacy Research & Practice, 8*, 85-96. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6649304/pdf/iprp-8-85.pdf

Lunde, L. H., Nordhus, I. H., & Pallesen, S. (2009). The effectiveness of cognitive and behavioral treatment of chronic pain in the elderly: A quantitative review. *Journal of Clinical Psychology in Medical Settings, 16*(3), 254-262. doi:10.1007%2Fs10880-009-9162-y

Lupien, S. J., Juster, R. P., Raymond, C., & Marin, M. F. (2018). The effects of chronic stress on the human brain: from neurotoxicity, to vulnerability, to opportunity. *Frontiers in Neuroendocrinology*, *49*, 91-105. doi: 10.1016/j.yfrne.2018.02.001

Maleki, N., Tahaney, K., Thompson, B. L., & Oscar-Berman, M. (2019). At the intersection of alcohol use disorder and chronic pain. *Neuropsychology, 33*(6), 795-807. doi:10.1037/neu0000558

McLeod, S. A. (2018). Skinner – operant conditioning. *Simply Psychology*. Retrieved from https://www.simplypsychology.org/operant-conditioning.html

McHugh, R. K., Votaw, V. R., Barlow, D. H., Fitzmaurice, G. M., Greenfield, S. F., & Weiss, R. D. (2017b). Development of an integrated cognitive behavioral therapy for anxiety and opioid use disorder: Study protocol and methods. *Contemporary Clinical Trials*, *60*, 105-112. doi: 10.1016/j.cct.2017.07.006

McHugh, R. K., Votaw, V. R., Bogunovic, O., Karakula, S. L., Griffin, M. L., & Weiss, R. D. (2017a). Anxiety sensitivity and nonmedical benzodiazepine use among adults with opioid use disorder. *Addictive Behaviors*, *65*, 283-288. doi: 10.1016/j.addbeh.2016.08.020

Mehalick, M., McPherson, S., Schmaling, K., Blume, A., & Magnan, R. (2016). Pharmacological management of chronic low back pain: A clinical assessment. *Journal of Pain Management*, *9*(1), 39-48.

Mehl-Madrona, L., Mainguy, B., & Plummer, J. (2016). Integration of complementary and alternative medicine therapies into primary-care pain management for opiate reduction in a rural setting. *The Journal of Alternative and Complementary Medicine*, *22*(8), 621-626. doi:10.1089/acm.2015.0212

Miguel, R. V. (2005). Pain medicine: Why and when to call for the addictionologist and/or psychiatrist. *Techniques in Regional Anesthesia and Pain Management*, *9*(4), 221-227. doi: 10.1053/j.trap.2005.10.008

Mills, K. L., Barrett, E. L., Merz, S., Rosenfeld, J., Ewer, P. L., Sannibale, C., ... Teesson, M. (2016). Integrated exposure-based therapy for co-occurring post-traumatic stress disorder (PTSD) and substance dependence: Predictors of change in PTSD symptom severity. *Journal of Clinical Medicine, 5*(101), 1-15. doi:10.3390/jcm5110101

Minnesota, U.O. (2020). *Types of statistical tests.* Retrieved from https//cyfar.org/types-statistical-test

Mojtabai, R., Amin-Esmaeili, M., Nejat, E., & Olfson, M. (2019). Misuse of prescribed opioids in the United States. *Pharmacoepidemiology and Drug Safety*, *28*(3), 345-353. doi:10.1002/pds.4743

Najavits, L. M., & Hien, D. (2013). Helping vulnerable populations: A comprehensive review of the treatment outcome literature on substance use disorder and PTSD. *Journal of Clinical Psychology*, *69*(5), 433-479. doi:10.1002/jclp.21980

National Institutes of Health. (2020). *Post-traumatic stress disorder*. Retrieved from https://medlineplus.gov/posttraumaticstressdisorder.html

Nichter, B., Norman, S., Haller, M., & Pietrzak, R. H. (2019). Psychological burden of PTSD, depression, and their comorbidity in the US veteran population: Suicidality, functioning, and service utilization. *Journal of Affective Disorders*, *256*, 633-640.

Okkersen, K., Jimenez-Moreno, C., Wenninger, S., Daidj, F., Glennon, J., Cumming, S., ... Faber, C. G. (2018). Cognitive behavioral therapy with optional graded exercise therapy in patients with severe fatigue with myotonic dystrophy type 1: A multicenter, single-blind, randomized trial. *The Lancet Neurology*, *17*(8), 671-680. doi:10.1016/S1474-4422(18)30203-5

Orem, D. (1971). *Nursing concepts of practice,* St. Louis: Mosby

Palmer, A., Karakus, M., & Mark, T. (2019). Barriers faced by physicians in screening for substance use disorders among adolescents. *Psychiatric Services*, *70*(5), 409-412. doi: 10.1176/appi.ps.201800427

Parker, M. A. (2019). Persistence of extra-medical prescription pain reliever use and alcohol involvement among United States 12–20-year-old. *Experimental and Clinical Psychopharmacology*, *27*(5), 502-509. doi:10.1037/pha0000262

Petersen, M., & la Cour, P. (2016). Mindfulness-what works for whom? Referral, feasibility, and user perspectives regarding patients with mixed chronic pain. *The Journal of Alternative and Complementary Medicine*, *22*(4), 298-305. doi:10.1089/acm.2015.0310

Polit, D., & Beck, C. (2017). Theoretical frameworks. In *Nursing research: Generating and Assessing Evidence for Nursing Practice* (pp. 117-136).

Ramachandran, S., Rosenthal, M., Young, J., Holmes, E., & Bentley, J. P. (2019). Subtle scales: An avenue for identification of prescription drug abuse. *Research in Social and Administrative Pharmacy*, *15*(8), 936-942. doi: 10.1016/j.sapharm.2019.02.010

Rogers, A. H., Shepherd, J. M., Orr, M. F., Bakhshaie, J., McHugh, R. K., & Zvolensky, M. J. (2019). Exploring anxiety sensitivity in the relationship between pain intensity and opioid misuse among opioid-using adults with chronic pain. *Journal of Psychiatric Research, 111*, 154-159. doi: 10.1016/j.jpsychires.2019.02.004

Schifano, F., Papanti, G. D., Corkery, J., & Orsolini, L. (2018). Post-traumatic stress and substance misuse; neurobiological and clinical pharmacological correlates. *Research and Advances in Psychiatry*, *5*(2), 52-60. Retrieved from https://uhra.herts.ac.uk/handle/2299/21143

Shiner, B., Leonard Westgate, C., Bernardy, N. C., Schnurr, P. P., & Watts, B. V. (2017). Trends in opioid use disorder diagnoses and medication treatment among veterans with posttraumatic stress disorder. *Journal of Dual Diagnosis*, *13*(3), 201-212.

Shmagel, A., Krebs, E., Ensrud, K., & Foley, R. (2016). Illicit substance use in US adults with chronic low back pain. *Spine, 41*(17), 1372-1377. doi:10.1097/BRS.0000000000001702

Schumacker, R.E, & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed.). New York, NY: Routledge Academic.

Sica, G. (2006). Bias in research studies. *Radiology, 38*(6), 780-789.

Skinner, B. (1976). *About behaviorism*. New York: Mass Market Paperback.

Slavich, G. M., Giletta, M., Helms, S. W., Hastings, P. D., Rudolph, K. D., Nock, M. K., & Prinstein, M. J. (2020). Interpersonal life stress, inflammation, and depression in adolescence: Testing social signal transduction theory of depression. *Depression and Anxiety*, *37*(2), 179-193. doi:10.1002/da.22987

Speed, T. J., Parekh, V., Coe, W., & Antoine, D. (2018). Comorbid chronic pain and opioid use disorder: Literature review and potential treatment innovations. *International Review of Psychiatry*, *30*(5), 136-146. doi:10.1080/09540261.2018.1514369

Stratton, A. M. (2018). A fresh look at opioids 268: Narcotic use trends in elective thoracolumbar spinal surgery patients. *The Spine Journal*, *18*(8),133-135. doi: 10.1016/j.spinee.2018.06.533

Sylvia, M. &. (2014). *Clinical analytics and data management for the DNP* (pp. 7-20). New York: Springer.

Takai, Y., Yamamoto-Mitani, N., & Chiba, I. (2017). The process of motivating oneself to resist being controlled by chronic pain: A qualitative study of older Japanese people living in the community. *Pain Management Nursing*, *18*(1), 42-49. doi: 10.1016/j.pmn.2016.10.004

Taylor, C. (2019, February 19). *ThoughtCo.* Retrieved from correlation and causation in statistics: http://www.thoughtco.com/correlation-and-causation-in-statistics-3126340

Tong, S. T., Polak, K. M., Weaver, M. F., Villalobos, G. C., Smith, W. R., & Svikis, D. S. (2019). Screening for psychotherapeutic medication misuse in primary care patients: comparing two instruments. *The Journal of the American Board of Family Medicine*, *32*(2), 272-278. doi:10.3122/jabfm.2019.02.180172

Tull, M. T., Forbes, C. N., Weiss, N. H., & Gratz, K. L. (2019). An investigation of the effect of trauma script exposure on risk-taking among patients with substance use disorders and posttraumatic stress disorder. *Journal of Anxiety Disorders, 62,* 77-85. doi: 10.1016/j.janxdis.2019.01.002

U. S. Preventive Services Task Force. (2020). *Unhealthy drug use: Screening*. Retrieved from https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/drug-use-illicit-screening

Van Damme, S., Legrain, V., Vogt, J., & Crombez, G. (2010). Keeping pain in mind: A motivational account of attention to pain. *Neuroscience & Biobehavioral Reviews, 34*(2), 204-213. doi: 10.1016/j.neubiorev.2009.01.005

Victor, G. A., Walker, R., Cole, J., & Logan, T. K. (2017). Opioid analgesics and heroin: Examining drug misuse trends among a sample of drug treatment clients in Kentucky. *International Journal of Drug Policy, 46,* 1-6. doi: 10.1016/j.drugpo.2017.01.008

Volkow, N. D., Jones, E. B., Einstein, E. B., & Wargo, E. M. (2019). Prevention and treatment of opioid misuse and addiction: A review. *Journal of American Medical Association: Psychiatry, 76*(2), 208-216. doi:10.1001/jamapsychiatry.2018.3126

Webster, L. & Webster, R. (2005). Redirecting aberrant behaviors in opioid treated patients: Preliminary validation of the Opioid Risk Tool. *Pain Medicine, 6*(6), 432-442.

Weiner, S. G., Horton, L. C., Green, T. C., & Butler, S. F. (2016). A comparison of an opioid abuse screening tool and prescription drug monitoring data in the emergency department. *Drug and Alcohol Dependence, 159,* 152-157.

Weinstock, J., Alessi, S. M., & Petry, N. M. (2007). Regardless of psychiatric severity the addition of contingency management to standard treatment improves retention and drug use outcomes. *Drug and Alcohol Dependence*, *87*(2-3), 288-296. doi: 10.1016/j.drugalcdep.2006.08.027

Wilson, B.A. (2020, July 2). *Understanding quantitative and qualitative approaches.* Retrieved from: https://www.accelerate.uofuhealth.utah.edu

Yarborough, B. J. H., Stumbo, S. P., Stoneburner, A., Smith, N., Dobscha, S. K., Deyo, R. A., & Morasco, B. J. (2019). Correlates of benzodiazepine use and adverse outcomes among patients with chronic pain prescribed long-term opioid therapy. *Pain Medicine*, *20*(6), 1148-1155. doi:10.1093/pm/pny179

Youngcharoen, P., Vincent, C., & Park, C. G. (2017). Theory of planned behavior constructs associated with nurses' pain assessment and pro re nata (PRN) opioid analgesic administration: A cross-sectional study. *Pain Management Nursing*, *18*(3), 153-169. doi: 10.1016/j.pmn.2017.03.001

Appendix A

Grand Canyon University Institutional Review Board Outcome Letter

GRAND CANYON UNIVERSITY

3300 West Camelback Road | Phoenix, Arizona 85017 | 602.639.7500 | Toll Free 800.800.9776 | www.gcu.edu

DATE September 29, 2020

TO Joelle Carson

FROM COLLEGE OF NURSING AND HEALTH CARE PROFESSIONALS

STUDY TITLE Decreasing Opioid Prescriptions Through Proper Screening

ACTION DETERMINATION OF QUALITY IMPROVEMENT/PROGRAM EVALUATION STATUS

DATE September 29, 2020

REVIEW CATEGORY QUALITY IMPROVEMENT/PROGRAM EVALUATION

In collaboration with the Institutional Review Board, The College of Nursing and Health Care Professions at Grand Canyon University has determined that this submission does not meet the definition of human subject research. The submission qualifies as Quality Improvement and/or Program Evaluation, therefore, further IRB review is not required. In future publications and/or presentations, please refer to this submission as Quality Improvement and/or Program Evaluation, not research. If the results of the project will not be published, presented, or disseminated outside of the institution, ensure that all those associated with the project are aware that the project is ongoing.

We will put a copy of this correspondence in your student file in our office. If you have any questions, please contact The DNP Program Lead Faculty, Dr. Katherine Fetter in the College of Nursing and Health Care Professions, Katherine.Fetter@gcu.edu.

Please include your project title and reference number in all correspondence with this office.

FIND YOUR PURPOSE

Appendix B

Webster's Opioid Risk Tool

Opioid Risk Tool

Mark each box that applies	Female	Male
Family history of substance abuse		
Alcohol	1	3
Illegal drugs	2	3
Rx drugs	4	4
Personal history of substance abuse		
Alcohol	3	3
Illegal drugs	4	4
Rx drugs	5	5
Age between 16—45 years	1	1
History of preadolescent sexual abuse	3	0
Psychological disease		
ADD, OCD, bipolar, schizophrenia	2	2
Depression	1	1
Scoring totals		

This tool should be administered to patients upon an initial visit prior to beginning opioid therapy for pain management. A score of 3 or lower indicates low risk for future opioid abuse, a score of 4 to 7 indicates moderate risk for opioid abuse, and a score of 8 or higher indicates a high risk for opioid abuse.

Questionnaire developed by Lynn R. Webster, MD to assess risk of opioid addiction.
Webster LR, Webster R. Predicting aberrant behaviors in Opioid-treated patients: preliminary validation of the Opioid risk too. Pain Med. 2005; 6 (6) 432

Appendix C

Permission to Use Webster's Opioid Risk Tool

Stacey J. Miller <sjmiller@bookpr.com>
Sun 9/20/2020 10:13 AM

Dear Joelle,

Thank you for your interest in the Opioid Risk Tool (ORT). You are welcome to use the ORT; we ask only that you cite this validation article (published in Pain Medicine) on any reproductions you might make:

Lynn R. Webster, Rebecca M. Webster, Predicting Aberrant Behaviors in Opioid-Treated Patients: Preliminary Validation of the Opioid Risk Tool, Pain Medicine, Volume 6, Issue 6, November 2005, Pages 432–442, https://doi.org/10.1111/j.1526-4637.2005.00072.x.

We have recently learned that the ORT has been inappropriately used to refuse opioids to people in pain. Please read this blog to explain how it has been misinterpreted: http://www.lynnwebstermd.com/opioid-risk-tool-has-been-inappropriately-weaponized/.

You may wish to know that Dr. Webster has written a book for the public titled, "The Painful Truth: What Chronic Pain is Really Like and Why It Matters to Each of Us." There is also a documentary with the same title that has aired on public television stations. You and your patients can watch it for free here - http://www.lynnwebstermd.com/painful-truth-documentary/. The documentary is different from the book.

To retrieve the ORT (including several translations) and the validation article, please visit: http://www.lynnwebstermd.com/opioid-risk-tool/.

Thanks again for your interest in the ORT. Please let me know if you have any problems accessing it, or if you need anything else.

Best,
Stacey

Stacey J. Miller
S. J. Miller Communications
www.bookpr.com