OPIOIDS: IMPLEMENTATION OF OPIOID PRESCRIBING EDUCATION AND POLICY IN A PRIMARY CARE CENTER

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

DOCTOR OF NURSING PRACTICE

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ABSTRACT

Many healthcare providers report not feeling confident when prescribing opioids, which represents an educational gap in the clinical setting that must be addressed to improve patient care and outcomes (Dowell, Haegerich, & Chou, 2016b). Healthcare providers attribute this lack of confidence in opioid prescribing to insufficient training on the tools provided to them to ensure safe prescribing habits. Thus, healthcare providers do not feel confident in managing patients' chronic pain. A healthcare provider's time spent with their patient is limited and therefore, needs to be utilized efficiently. In order to achieve effective time management, healthcare providers need to be experts on chronic pain management and self-assured with their practice in relation to opioids.

This practice improvement project focused on increasing healthcare providers' knowledge and confidence when prescribing opioids for chronic pain and managing chronic pain. An educational intervention with health professionals working in federally qualified health centers in North Dakota was implemented via Skype. The intervention allowed healthcare providers to be up-to-date on the most recent evidence-based literature and guidelines regarding this topic. Throughout this practice improvement project, healthcare providers were educated on the latest Centers for Disease Control (CDC) and Prevention Guideline for Prescribing Opioids for Chronic Pain, provided resources for their clinical practice, and given an opportunity to evaluate their own knowledge and confidence.

The implementation of the practice improvement project was comprised of an educational session. To assess the participants' knowledge, a pre-test was provided prior to the educational session and a post-test was given following the educational session. Furthermore, a

self-confidence evaluation survey was administered, which utilized a Likert scale. Lastly, the clinic's policies and pain agreements related to pain and opioids were reviewed and discussed.

The results of the project indicated an overall increase in the participants' knowledge and self-confidence. In addition, the project promoted awareness of the clinic's current pain agreement and the likelihood of a future implementation of a policy regarding chronic pain management. The educational session was beneficial in promoting the use of evidence-based research and guidelines in the primary care setting.

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DEDICATION

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CHAPTER ONE. INTRODUCTION

Background and Significance

During the late 1990's, pharmaceutical companies expressed to the healthcare community the belief that patients would not develop addiction in relation to opioids (U.S. Department of Health and Human Services, 2019). This led to an increase in healthcare providers prescribing opioids to their patients for chronic pain management. Healthcare providers quickly learned opioids are highly addictive and have the potential to be misused. Regrettably, this helped steer the United States to face an opioid epidemic. Since the year of 1999, deaths from prescription opioids have escalated by more than five times. Alarmingly, the United States is only 4.6% of the world's population; however, roughly 80% of the opioids produced are consumed in the United States (Kaplan, 2015). Unfortunately, our country is now searching for ways to minimize the opioid epidemic.

Healthcare providers play an essential role in reducing the opioid epidemic and improving the way opioids are prescribed. However, healthcare providers have communicated challenges in treating, assessing, and preventing chronic pain (Dowell, Haegerich, & Chou, 2016b). Unfortunately, this has only contributed to the opioid epidemic. Improving healthcare providers' prescriptive practices in the clinical setting by increasing provider knowledge and confidence regarding opioids has the potential for patients to experience more effective and safe pain management (Centers for Disease Control and Prevention [CDC], 2017b). Enhanced healthcare provider knowledge may also reduce the opioid misuse, abuse, and overdose among patients and improve outcomes.

Prevalence

The number of deaths associated with drug overdose is a growing concern for many states. According to the CDC, in 2017 there were a total of 70,237 deaths related to drug overdoses (2017b). In turn, 68% of those deaths were related to the overdose of opioids. Fortunately, there has not been a statistically significant increase in opioid-related deaths in North Dakota. In fact, a 13.2% decrease in drug-related deaths was noted in North Dakota from 2016 to 2017. North Dakota ties with South Dakota for the lowest number of opioid overdose deaths at 35 individuals in 2017 (Kaiser Family Foundation, 2019). The most common type of opioid-related death within the United States were synthetic opioids. However, in North Dakota, the most common cause of opioid-related death was natural and semi-synthetic opioids. Individuals between the ages of 25 and 34 had the highest rates of opioid-related deaths in the United States. Although North Dakota ranks low nationally, prescription drug abuse still remains a significant issue. According to the North Dakota Office of Attorney General (2016), 14.5% of students in high school have taken a prescription drug that was not prescribed to them, such as Percocet.

Impact

Healthcare providers need to weigh the risks and benefits when prescribing opioids, as there are many negative consequences that can greatly impact patients who are receiving chronic opioid therapy. When a patient misuses opioids, this can lead to a substance use disorder, as well as many other health complications. When a patient suffers from a substance use disorder, this also greatly impacts their quality of life. Patients with substance use disorders often experience changes to their brains, causing other health issues and failure to meet day to day expectations (National Institute on Drug Abuse, 2018). Not only do the patients who are misusing opioids

have the potential to suffer or experience negative consequences, so do their families. Specifically, this can greatly impact children. For example, in the United States, neonatal abstinence syndrome has tripled from the year of 2004 to 2013. This means an unfortunate number of innocent babies have had to experience withdrawal due to having their mothers taking opioids while they were pregnant. In addition, the number of children living in foster homes in the United States due to parental substance use disorder has increased by 10% (Brundage & Levine, 2019).

Purpose

The purpose of this practice improvement project was to utilize evidence-based research and the CDC Guideline for Prescribing Opioids for Chronic Pain to improve healthcare providers' knowledge and confidence when prescribing opioids for chronic pain and managing chronic pain in a family practice clinic. Implementation of this project provided an opportunity for healthcare providers to become up-to-date on the most recent evidence-based research and to incorporate this information into their practice. In turn, this project may also result in reducing misuse, abuse, and overdose associated with prescription opioids. Patients at the clinic in which the practice improvement project was implemented may have also benefited from the intervention, as enhanced provider knowledge can result in high quality care and potentially improved patient outcomes and quality of life.

CHAPTER TWO. LITERATURE REVIEW

Review of Literature

A literature search to better understand chronic pain, opioids, and prescribing practices was performed using electronic databases including Cumulative Index to Nursing and Allied Health Literature (CINAHL), PudMed, and Google Scholar. The search also encompassed the Centers for Disease and Control and Prevention (CDC) website. The key terms used while researching consisted of "pain," "chronic pain," "acute pain," "opioids," "chronic pain management," "non-pharmacological practices," "non-opioid analgesics," "substance abuse," "mental health illness," "risk factors," "PDMP," "urine drug screening," "pain contracts," "pill counts," "healthcare providers prescribing practices," and "chronic pain guidelines."

In order to ensure the most up-to-date research was involved in this review of literature, only articles published after 2013 were incorporated. However, this excludes The American Pain Society Guideline for the Use of Chronic Opioid Therapy in Chronic Noncancer Pain, which was released in 2009. Articles with a focus on management of acute pain and the pediatric population were excluded from the literature review. While performing the review of literature, the CDC Guideline for Prescribing Opioids for Chronic Pain was easily identified as the strongest and most user-friendly guideline for prescribing opioids for chronic pain management. The CDC guideline was utilized as the supporting base of this literature review.

Introduction

Chronic pain is one of the most prominent and encumbering medical conditions but also among the most controversial and complex for healthcare providers to manage (Volkow & McLellan, 2016). Healthcare providers have expressed many challenges in treating, assessing, and preventing chronic pain (Dowell et al., 2016b). Unfortunately, this has led the United States

to develop an overreliance on opioid medications when treating patients' pain and a distressing increase in opioid misuse, abuse, overdose, and addiction (Volkow & McLellan, 2016). Many professional organizations have created guidelines to improve opioid prescriptive practices among healthcare providers, increase healthcare providers' confidence and knowledge, and most importantly, enhance patients' health outcomes and quality of life (Dowell et al., 2016b). With the use of evidence-based guidelines and awareness of the increase in opioid prescriptions, there is potential to reverse the progression of opioid misuse and ultimately, put a halt to the opioid epidemic.

Opioids

Opioids are a class of drugs, which are chemically comparable to alkaloids found in opium poppies. Opioids have historically been known as painkillers (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016). Many individuals benefit from the use of opioids to help manage pain due to their analgesic effect. However, opioids can also be dangerous due to their highly addictive properties and potential to be abused. Opioids produce euphoric effects (Matthews & Fellers, 2016). These overjoyed and elated effects lead to addiction and non-medical use of opioids. Recurrent and frequent use of opioids increases an individual's risk of developing an opioid use disorder.

According to the CDC (2017a), opioids are classified into one of four categories. The first category is natural opioids and semi-synthetic opioids. Semi-synthetic opioids are man-made and produced from natural opium products (United States Drug Enforcement Administration, 2019). Natural opioid analgesics include morphine and codeine, and semi-synthetic opioid analgesics consist of oxycodone, hydrocodone, hydromorphone, and

oxymorphone (CDC, 2017a). The preceding opioids are well known due to the increased prevalence of prescriptions written by providers to treat moderate to severe pain.

Another opioid category consists of methadone, which is a synthetic opioid. Synthetic opioids are man-made, imitating natural opioids analgesics (CDC, 2017b). The third category is synthetic opioid analgesics, which entails tramadol and fentanyl (CDC, 2017a). Lastly, there is Heroin, which is an illegally made opioid synthesized from morphine, which comes in a powder form or a sticky substance.

Chronic Pain

Pain can be classified by chronicity into two major categories, acute and chronic (Agency Medical Directors' Group [AMDG], 2015). Acute pain is pain that typically is sudden and lasts less than three months. The pain predictably terminates after the tissue has healed. Conversely, chronic pain is defined as pain that persists for at least three months in duration or pain that has continued beyond the expected time of tissue healing. In addition, some individuals unfortunately do experience acute pain that progresses into chronic pain, which is termed pain chronification. The classification of pain is dependent upon how long the pain is expected to last or how long the pain has lasted (Cheng, 2017; Katzman et al., 2014).

There is a high prevalence of chronic pain in the United States that has dramatically increased in recent years (Tompkins, Hobelmann, & Compton, 2018). In fact, pain is the most common reason a person pursues outpatient medical assistance. The two most prevalent complaints and diagnoses of pain include low back pain and headaches. Today, approximately 100 million Americans are currently living with chronic pain, and 35 million people in America have used a painkiller in a non-medical manner during their lifetime (Katzman et al., 2014;

Tompkins et al., 2018). Chronic pain has become an overwhelming concern in America and has generated a burden of opioid abuse.

While chronic pain affects people of all races, genders, ages, and socioeconomic status, there are certain risk factors associated with greater risk of experiencing chronic pain. More specifically, individuals who have a greater risk include women in comparison to men and individuals who have a lower annual income in contrast to those who have a high annual income (Katzman et al., 2014). In addition, pain has been recognized to increase with age. Pain is also more common in military veterans than nonveterans (U.S. Department of Health and Human Services, 2018a). Recognizing at-risk populations or particular groups is essential to assist healthcare providers to effectively identify and treat chronic pain promptly.

Chronic pain has been associated with various negative consequences and comorbidities. For instance, a decreased quality of life, anxiety, depression, increased medical costs, and opioid dependence are possible accompanying concerns when experiencing chronic pain (U.S. Department of Human and Health Services, 2018b). Therefore, healthcare provider awareness of multifaceted ways to effectively treat or minimize chronic pain is important to decrease the secondary complications that can be associated with chronic pain.

Non-Pharmacological Therapies

Treatment of chronic pain is most successful when multiple approaches are used by healthcare providers, including non-pharmacological and alternative therapy, which has been shown to improve patients' pain, quality of life, and ultimately reduce disability (AMDG, 2015). In contrast to pharmacological approaches to pain, non-pharmacological therapies can eliminate side effects that are produced from analgesics. Examples of non-pharmacological therapies include complementary alternative medicine, weight loss, cryotherapy, application of heat or

cold devices, physical therapy, exercise therapy, acupuncture, yoga, cognitive behavioral therapy, meditation, and sleep hygiene (AMDG, 2015; Dowell et al., 2016b). Alternative therapy, such as mindfulness-based therapy, which consists of meditation and yoga, has been effective in assisting patients to personally manage their sensations of pain. In addition, support groups have multiple benefits for those suffering from chronic pain, including educating patients about their chronic pain, creating a social support network, and decreasing the physical and psychosocial burden associated with chronic pain. Chronic pain is a multidimensional experience, and management of pain is more successful when healthcare providers use a multidisciplinary approach (AMDG, 2015).

Non-Opioid Pharmacologic Treatment

Many pain guidelines recommend using acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) alone or in combination as a first line therapy for most pain conditions (Dowell, Haegerich, & Chou, 2016a; Pergolizzi et al., 2016). Clinical recommendations suggest starting with acetaminophen for pain defined as mild to moderate, whereas NSAIDs are recommended for patients suffering from inflammatory or nociceptive pain (AMDG, 2015). Regardless of the type of analgesic, there are possibilities of risks or the potential for adverse side effects (Dowell et al., 2016b). For example, acetaminophen has been shown to be hepatotoxic when more than the recommended dose of three to four grams per day is taken, and NSAIDs have been associated with potential undesirable gastrointestinal and cardiovascular events (Dowell et al., 2016b; Pergolizzi et al., 2016). According to AMDG (2015), “when (acetaminophen) is combined with ibuprofen 200 mg, the combination has been demonstrated to be more effective than opioids” (p. 19).

While OTC analgesics do have the potential for adverse effects, they are not associated with addiction (Dowell et al., 2016b). Furthermore, these medications for pain have been associated with minimal overdoses in comparison to opioids. For instance, in 2010, there were 16,651 opioid overdose deaths that occurred in the United States, while there were 881 and 228 overdose deaths with acetaminophen and NSAIDs respectively. Therefore, non-opioid medications are most often considered safer when used to treat chronic pain.

Antidepressants, such as, tricyclic antidepressants (TCAs) and serotonin-norepinephrine reuptake inhibitors (SNRIs), as well as the anticonvulsants, such as gabapentin and pregabalin, play an important role in managing patients' pain dependent upon the diagnosis. TCAs and SNRIs are particularly helpful in managing pain for persons diagnosed with neuropathic pain or fibromyalgia (AMDG, 2015; Mehta, Guy, Lam, Teasell, & Loh, 2015). In fact, TCAs are considered first-line therapy for treatment of neuropathic pain. TCAs are effective in treatment of neuropathic pain with their unique ability to prevent the reuptake of serotonin and norepinephrine, allowing for increased levels (Obata, 2017). Similarly to opioids and OTC analgesics, these medications also have the potential for adverse effects. For example, TCAs and SNRIs have the potential for sedation, and providers must educate their patients regarding these and other potential adverse effects (AMDG, 2015).

Muscle relaxants, such as cyclobenzaprine, are also used for pain management. Muscle relaxants have been found to be beneficial for treatment of spasticity, such as for a spinal cord injury (AMDG, 2015). According to AMDG (2015), muscle relaxants should not be used for more than 14 days, as they have not been shown to provide benefit for chronic pain management or long-term use. Unfortunately, these medications are often prescribed by healthcare providers

for an extended length of time at higher quantities. Similar to TCAs and SNRIs, sedation is one adverse effect of cyclobenzaprine (AMDG, 2015; Witenko et al., 2014).

The CDC guideline states that first line therapy treatment for chronic pain does not include opioid therapy (Dowell et al., 2016b). During each patient interaction, the healthcare provider needs to ensure the benefits outweigh the risks prior to prescribing opioid therapy. Thus, non-pharmacological practices and non-opioid therapy are preferred for chronic pain management. Healthcare providers should only contemplate using opioids as pain management therapy after implementation of other interventions without success. However, if the healthcare provider does prescribe opioids to their patient, opioid therapy should be combined with non-pharmacological and non-opioid therapy.

Opioids for Chronic Pain

Opioids are frequently prescribed by healthcare providers for patients suffering from acute or chronic pain. However, available evidence provides minimal support when opioids are prescribed for the treatment of chronic pain (AMDG, 2015). In fact, there is an increased risk for potential harm when prescribing opioids for chronic pain, which may include overdosing and/or developing an opioid use disorder (AMDG, 2015; Dowell et al., 2016b). Due to the increase in patient visits for chronic pain, use of opioids for management of chronic pain has become a common practice (Dowell et al., 2016b; Downes et al., 2018).

If a healthcare provider chooses to prescribe an opioid for chronic pain, there are multiple recommendations suggested for healthcare providers to incorporate into their patients' plan of care. The CDC guideline suggests healthcare providers prescribe short-acting opioids when initiating opioids for chronic pain rather than long-acting or extended-release opioids (Dowell et al., 2016b). A study by Miller et al. (2015) found that patients who were taking long-acting

opioids were more at risk for accidental overdose in comparison to those who were taking short-acting opioids. In addition, patients who were prescribed long-acting opioids were more likely to be prescribed a higher daily dose of opioids. Long-acting opioids need to be reserved for patients suffering from pain that is characterized as severe and continuous. Furthermore, it is recommended that the patient try short-acting opioids for at least one week prior to being prescribed long-acting opioids.

Another recommendation proposed by the CDC guideline is for healthcare providers to prescribe the lowest effective dose of opioids (Dowell et al., 2016b). Guidelines recommended that patients be restricted to 50 mg morphine equivalents (MME) per day when being started on opioid therapy (Busse et al., 2017; Dowell et al., 2016b). Doses greater than 50 MME increase a patient's risk of overdosing and do not necessarily improve pain control (AMDG, 2015; Dowell et al., 2016b). Additional important considerations when determining a patient's plan of care include the onset of action and an effective dose for opioids.

Upon initiating opioid therapy, healthcare providers need to have a serious discussion with their patients including realistic treatment goals and timelines for discontinuation of opioid therapy (Dowell et al., 2016b). The goals should include improvement in both pain control and quality of life. According to the Dowell et al. (2016), a 30% improvement of patients' pain and function is considered a clinically significant percentage. This can be measured by using an assessment scale titled "Pain average, interference with Enjoyment of life, and interference with General activity (PEG)" (p. 25). The PEG assessment scale is an instrument that contains three questions relating to the patient's average pain rating, the effect of their pain on their enjoyment in life, and the impact of pain with general activity. Each question is rated on a scale of 0-10. If improvement is not measured to be at least 30%, opioids need to be tapered and possibly

discontinued. Thus, the benefits of opioid therapy, including pain control and enhanced quality of life, must outweigh the risks.

Risk factors. As stated previously, opioids have the potential for adverse effects and other risks, which must be weighed against the benefits when patients are being treated with opioid therapy for chronic pain management (Dowell et al., 2016b). Prior to initiation of opioid therapy, a healthcare provider must discuss opioid-related risk factors with each of their patients (AHRQ, 2014). Risks associated with opioid use include adverse effects, increased risk of harm, and risks associated with opioid use during pregnancy.

Adverse effects. There are many adverse effects associated with the use of opioids. Common adverse effects include constipation and drowsiness. (AMDG, 2015; Dahan, van der Schrier, Smith, Aarts, & Velzen, 2018; Rogers, Mehta, Shengelia, & Reid, 2013). Constipation is one of the most common adverse effects, especially in older adults. Often healthcare providers will prescribe a stool softener or laxative to aid in management of patients' constipation and to maintain a consistent bowel movement regimen. If opioid-related constipation is not treated, it may lead to serious complications, such as bowel obstruction (Mehta, Shengelia, & Reid, 2013).

Drowsiness or sedation is another common side effect patients experience when taking opioids (Portenoy, Mehta, & Ahmed, 2019). This is most often seen when healthcare providers are initiating therapy or increasing a patient's dose. Drowsiness will affect each patient differently ranging from slight fatigue to delirium. However, the majority of patients do develop a tolerance to opioids shortly after starting therapy, which may be seen within days. If a patient is suffering from drowsiness, the healthcare provider may reduce the patient's dose to minimize this side effect while still providing benefit regarding the patient's pain. These side effects are dose dependent, unlike constipation (Rogers et al., 2013).

Other adverse effects are less common and may consist of nausea, vomiting, and respiratory depression. Respiratory depression is an adverse effect that must be discussed, as this adverse effect has the potential to become lethal (Dahan et al., 2018). Respiratory depression is especially concerning when opioids are used in combination with other centrally-depressant drugs, such as alcohol. In addition, co-prescription of opioids with benzodiazepines, other sedating drugs, or additional opioids can lead to an increased risk of opioid-related respiratory depression (Dowell et al., 2016b). Healthcare providers may initiate naloxone prescriptions to patients who they believe may be at an increased risk of respiratory depression. Overall, adverse effects need to be discussed with patients prior to initiating therapy.

Potential harms. The risk of potential harms associated with opioid therapy are quite lengthy and startling. Potential opioid-related harms include the increased risk of opioid overdose, abuse and misuse, falls, fractures, motor vehicle accidents, cardiovascular incidents, cognitive impairment, and psychological harm (AHRQ, 2015). Of the preceding harms mentioned, the most well-known and most commonly mentioned is opioid overdose. Patients who were prescribed higher daily doses of opioids had an increased risk of overdosing. Furthermore, the risk of a patient overdosing doubles when a patient is prescribed a daily morphine equivalent dose (MED) between 20 and 49 mg (AMDG, 2015). Healthcare providers and patients need to take all potential harms into consideration prior to starting an opioid for pain management.

Pregnancy. Opioids and pregnancy is a topic that is poorly understood due to the ethical consideration of having pregnant women participate in clinical trials. However, an established fact is that opioids cross the placental barrier, which can lead to potential adverse effects on the fetus (Yazdy, Desai, & Brogly, 2015). Possible adverse effects consist of preterm delivery, birth

defects, poor fetal growth, and neonatal withdrawal (AHRQ, 2014; Dowell et al., 2016b; Yazdy et al., 2015). Unfortunately, prescribing opioids to pregnant women has increased in the United States due to the complaints of pain associated with pregnancy, such as low back pain (Yazdy et al., 2015). Approximately 68% to 72% of pregnant women complain of pain to their lower back and/or pelvic region. This is a vital time for healthcare providers to discuss alternative medications or non-pharmacological practices for pain control. Further research is also necessary to further identify potential adverse effects on the fetus when pregnant women are utilizing opioids.

Benefits. Benefits of opioid therapy for chronic pain is a controversial topic among many healthcare providers due to the increased risks associated with their use. However, opioids should not be dismissed altogether. In fact, opioids have been beneficial for some patients when treating their chronic pain, such as patients with chronic low back pain. Appropriate prescribing and management of opioid therapy is necessary and includes careful monitoring and an individualized treatment plan (AMDG, 2015; Huber, Robinson, Noe, & Van Ness, 2016). In addition, there is evidence that supports the use of opioids for treating short-term or acute pain (AMDG, 2015; Downes, Klepser, Foster, & Nelson, 2018). Treating patients with opioids for acute injuries is a standard of care (AMDG, 2015). Huber et al. (2016) recommends limiting opioid therapy to 16 weeks for patients needing pain relief. Overall, healthcare providers need to be cognizant when prescribing opioids to their patients in order to maximize their use while minimizing the risks associated with opioids.

Healthcare Providers' Prescriptive Practices

Healthcare provider education and awareness regarding standards of care for treatment of chronic pain is vital to utilize best practices. Healthcare providers are the projected experts to

promote the best possible outcome (MeIynk & Fineout-Overholt, 2015). This is also true when healthcare providers are prescribing opioids to their patients and managing their chronic pain, as patients trust healthcare providers to be the experts. Patients have an expectation that healthcare providers are educated on standards of care related to chronic pain management and prescribing opioids.

There is a plethora of guidelines accessible to healthcare providers, which can help standardize care when it comes to prescribing opioids and chronic pain management. Even with multiple guidelines available, healthcare providers continue to report feelings of concern about patients misusing opioids or becoming addicted (Dowell et al., 2016b; Hudspeth, 2016). Furthermore, healthcare providers report managing chronic pain to be stressful and express insufficient education when it comes to prescribing opioids safely, which may lead to the potential for errors when prescribing opioids. A study reviewing a total of 510 opioid prescriptions performed by Bicket, Kattail, Yaster, Wu, and Pronovost (2017) revealed errors on 42% of the opioid prescriptions written for patients discharging from a medical center. Examples of errors included inaccurate dates, frequency of the medication, and number of tablets. In addition, there is also a lack of confidence reported from healthcare providers in relation to detecting patients who are abusing prescription drugs and the ability to communicate with their patients about abuse (Dowell et al., 2016b).

Healthcare providers inconsistently use the tools provided to them to help ensure safe prescriptive practices including Prescription Drug Monitor Programs (PDMPs), urine drug screening, and opioid therapy agreements (Dowell et al., 2016b). Contributing factors to inconsistent use of available tools include healthcare providers facing challenges related to using the PDMP, time constraints, and limited knowledge regarding urine drug testing results and

interpretation. Healthcare providers need to be well-aware and educated on the tools available for them. In turn, healthcare providers have a professional obligation to be updated on interventions that can be implemented into a patient's plan of care to aid in preventing opioid misuse (Hudspeth, 2016).

Pain has become widely accepted as the fifth vital sign (Morone & Weiner, 2013). Due to this occurrence, patients have been required to report their pain level at each clinic visit. In turn, this causes healthcare providers to feel pressured to address pain, and patients often expect an immediate response from their healthcare providers. Unfortunately, assessment of pain as a fifth vital sign may have contributed to an increase in opioid prescriptions due to healthcare providers feeling incompetent when managing chronic pain. The movement of transforming pain to become the fifth vital sign has exposed insufficiencies in healthcare provider training and education.

Gap in Practice

An educational gap in the clinical setting that needs to be addressed is the fact that healthcare providers do not feel confident when prescribing opioids, as many healthcare providers report insufficient training on the tools provided to them to ensure safe prescribing habits (Dowell et al., 2016b). Thus, healthcare providers do not feel confident in managing patients' chronic pain (Morone & Weiner, 2013). Additionally, healthcare providers are inconsistent in their opioid prescribing habits, and prescription errors related to opioids are common, which can impact patient safety. In fact, Bicket et al. (2017) found errors on 42% of the opioid prescriptions written by healthcare providers in their study. A healthcare provider's time spent with their patient is limited and therefore, needs to be utilized efficiently. In order to achieve effective time management, healthcare providers need to be experts on chronic pain

management and self-assured with their practice in relation to opioids. More training and education needs to be offered to healthcare providers to aid in closing this gap.

Furthermore, Upshur, Luckmann, and Savgeau (2006) found healthcare providers lack confidence and appropriate education when providing treatment for patients who are suffering from chronic pain. The study concluded that there is room for improvement in medical and postgraduate education in regard to managing patients' chronic pain and opioids. Additionally, more education is necessary for healthcare providers and their patients related to the significance of non-opioid therapy, including non-pharmacologic therapies and non-opioid analgesics. Bicket et al. (2017) identified that a number of the prescriptions written for patients could have been avoided all together by prescribing non-narcotic medications while still providing adequate pain relief.

Methods of Improving Prescriptive Practices

Improving opioid prescriptive practices is a priority in healthcare in order to enhance patient outcomes (Dowell et al., 2016). Patient outcomes can be improved by reducing pain, increasing patients' quality of life, and reducing the number of adverse events, including opioid misuse, abuse, and overdose. Healthcare providers' prescriptive practices can be improved by following chronic pain management guidelines and safe prescriptive practices.

Chronic Pain Management Guidelines

Incorporating evidence-based practice and implementing change into practice are challenging and demanding tasks experienced by healthcare providers in the healthcare setting. However, utilizing resources and clinical tools, such as guidelines to improve consistency of care, can help facilitate change (MeInyk & Fineout-Overholt, 2015). In order to ensure adequate management of chronic pain and decrease the risks associated with opioid abuse, healthcare

providers' adherence to guidelines when prescribing opioids is essential (Tournebize, Gibaja, Muszczak, & Karhn, 2016).

There are multiple clinical practice guidelines in regard to prescribing opioids for chronic pain management including the CDC, The American Pain Society (APS) with The American Academy of Pain Medicine (AAPM), and AMDG. In addition, the APS with the AAPM guideline (2009) list many other published guidelines, such as The American Society of Interventional Pain Physicians, The British Pain Society, Janssen Pharmaceutical, U.S. Department of Veterans Affairs/Department of Defense, The Canadian Pain Society, and The Australian Pain Society. Due to the surplus of guidelines for clinical practice when using opioids for chronic pain management, providers may have difficulty knowing which guideline(s) to follow.

All of the guidelines listed within the APS-AAPM clinical guideline (2009) have similar recommendations. Examples of these comparable recommendations consist of trying non-opioid analgesics and non-pharmacological interventions prior to initiating opioid therapy, using opioid therapy agreements, assessing for aberrant-related behaviors before starting the patient on opioids, and prescribing long-acting opioids given regularly instead of short-acting opioids as needed (Dowell et al., 2016). However, the CDC recommends the patient to have taken a minimum of one week of immediate release opioids prior to initiating daily, long-acting opioids.

Safe Prescriptive Practices

The process in which opioids are prescribed must be improved by healthcare providers in order to allow patients to have access to safer and more successful treatment of their chronic pain (Clack, Kadlec, Spiro, & Wendicke, 2018). Healthcare providers need to be educated and aware of the resources provided to them in order to aid in the prevention of the overwhelming misuse,

abuse, and overdose that is associated with prescription opioids. There are multiple opportunities for healthcare providers to improve their prescriptive practices in relationship to the opioid epidemic.

While technology and health information management can support the reduction in opioid prescriptions, increased healthcare provider awareness and knowledge of safe prescribing practices are necessary (Dowell et al., 2016b). Assessment tools, such as Screener and Opioid Assessment for Patients with Pain (SOAPP), pain contracts, urine drug screens, prescription drug monitoring programs, pill counts, and well-researched guidelines and algorithms are resources and interventions healthcare providers can use to enhance their clinical management of opioid therapy for patients with chronic pain. In addition, healthcare providers need to make sure they are obtaining an adequate history with each patient encounter. Thus, similar to other chronic diseases, patients' chronic pain needs to be monitored for progression or improvement, which can be achieved with the help of various tools that will be discussed below.

Assessment tools. There are multiple assessment tools healthcare providers can utilize to screen patients and assess for a risk of opioid addiction and abuse. Examples of these tools consist of the Opioid Risk Tool (ORT) and Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R), among many others (AMDG, 2015; Matthews & Fellers, 2016). The SOAPP-R assessment tool is the most studied and well-known (Finkleman et al., 2015). The SOAPP-R is a 24-question tool that obtains information about the patient by self-report. The tool is generally easily comprehended by patients and typically takes less than 10 minutes to complete (AMDG, 2015; Finkleman et al., 2015). SOAPP-R was revised to be less transparent to patients in relation to how the tool is scored. After the patient takes the questionnaire, the patient is either flagged as "positive" or "negative." If a patient is "positive," this means the patient is at

a high risk for unsafe behavior related to medication use, while a "negative" means the patient is at low risk (Finkleman et al., 2015). The assessment tools are readily available for healthcare providers, and they have demonstrated validity when screening and monitoring patients who are prescribed opioids (AMDG, 2015).

Pain agreement. A pain contract or pain agreement is a document between the patient and healthcare provider used to assist in promoting compliance. Pain agreements explain patients' plan of care and realistic goals of treatment pertaining to the opioid prescribed for chronic pain (AMDG, 2015; Dowell et al., 2016b; National Academics of Sciences, Engineering, and Medicine, 2017). More specifically, the document may include a tool to aid in determining whether or not the opioid has been effective for the patient. Multiple tools exist to assist healthcare providers in determining the effectiveness of a pain agreement. An example of a validated tool used to assess the patient's progress includes the PEG assessment scale, which was discussed in the above sections. Furthermore, the document needs to encompass a section including stipulations that can hinder a patient's continuation of opioid therapy. If the treatment is deemed to be unsuccessful or benefits do not outweigh the risks, discussion of opioid discontinuation is necessary (Dowell et al., 2016b). The American Academy of Family Physicians (2018) has a toolkit for pain management readily available that incorporates a pain agreement made available for healthcare providers to use. Thus, the pain agreement needs to be discussed between the healthcare provider and patient prior to initiating opioid therapy in order to define clear expectations (Dowell et al., 2016b).

Pain agreements provide an opportunity for the healthcare provider to explain the risks and benefits of managing their pain with an opioid. Many patients lack the understanding and educational pieces needed prior to starting an opioid, and healthcare providers may also miss

vital opportunities to teach their patients (Dowell et al., 2016b). Healthcare providers must educate patients prior to starting an opioid that research does not support the use of opioids for long-term pain management. Additionally, healthcare providers can also educate patients that pain may still exist after initiation of therapy, but an improvement in daily functioning is the main goal. In addition, a discussion of adverse effects should take place between provider and patient, including reviewing the risks for respiratory depression and development of an opioid use disorder. According to the CDC (2016), reviewing the risks and benefits of opioid therapy for pain management is recommended at least every three months throughout therapy.

Urine drug screening. Drug testing, when used correctly and interpreted accurately, can add significant information about the patient, which the patient may otherwise not report to their healthcare provider (Dowell et al., 2016b). There are multiple sources utilized for drug testing including urine, blood, saliva, hair, breath, sweat, and meconium. However, urine is reported to be the most researched and widely used form of drug testing among healthcare providers (Hadland & Levy, 2016). Thus, drug testing is an option for healthcare providers to use in the clinical setting to aid in obtaining critical objective information.

A urine drug screen is a way to obtain objective evidence in regard to the patient being treated with opioids. A urine drug screen can help to detect use of prescribed opioids, or if a patient is not using the opioids prescribed to them, which may unfortunately indicate diversion of opioids (Matthew & Fellers, 2016). In addition, drug screens can assist in telling the healthcare provider if a patient is concurrently misusing other opioids that are not prescribed to them (Dowell et al., 2016b; Matthew & Fellers, 2016) However, urine drug screening will not detect the amount of opioids taken (Dowell et al., 2016b). Patients who are at risk for opioid misuse or abuse can be challenging for healthcare providers to predict or detect through solely interviewing

the patient (Dowell et al., 2016b; Matthews & Fellers, 2016). Matthews and Fellers (2016) found 20% of patients in their study had unexpected positive drug screen results when the provider's assessment did not have any reason to question opioid misuse or abuse.

According to AMDG (2015) and Dowell et al. (2016b), urine drug screening should be completed prior to initiating opioid therapy. However, there is inconsistency among the research as to how often or when urine drug screening should take place after the initial screening. Matthews and Fellers (2016) suggest urine drug screening frequency to be completed based on the patient's risk level. A patient considered "low risk" can be tested biannually to annually, whereas a "standard risk" patient is recommended to be tested quarterly. Patients who are "high risk" may be tested more frequently and randomly. Urine drug screening is a helpful tool that can be used in the clinical setting as a way to evaluate patient adherence when managing chronic pain with opioids.

Many well-known guidelines recommend the use of urine drug screening; however, urine drug testing is considered to be a burden for some providers. Urine drug screening is recommended by clinical guidelines from The American Pain Society, The American Academy of Pain Medicine, the American Society of Interventional Pain Physicians, and the Federation of State Medical Boards (Matthews & Fellers, 2016). However, even after the support from many guidelines, healthcare providers continue to underutilize the tool when managing patients' chronic pain. In fact, Matthews and Fellers (2016) found 8% of patients being treated with opioids for chronic pain underwent urine drug screening. A reasoning behind the little use of urine drug screening may relate to healthcare providers not feeling confident when reading and interpreting urine drug tests. On the other hand, some experts report urine drug screening to be a burden due to the time it takes to interpret results and communicate them to their patients. In

addition, there is concern in accuracy when obtaining a urine sample due to the risk of samples being tampered with (Hadland & Levy, 2016).

Prescription drug monitoring programs. PDMPs are electronic databases that aid in monitoring prescriptions of controlled substances (CDC, 2017c). Authorized users include physicians, nurse practitioners, physician's assistants, and pharmacists who are allowed to access the database to obtain information related to the medication and dose that was prescribed to a specific patient. The objective of the PDMP is to "detect patterns of drug abuse, and prevent doctor shopping or prescription duplication by maintaining a database of all prescriptions of controlled substances issued to a patient" (Ayres & Jalal, 2018, p. 387). The majority of overdoses that result in death have been associated with patients who have multiple healthcare providers prescribing opioids and/or patients who are receiving a greater daily dosage of opioids. Ultimately, information on scheduled medications prescribed to patients can be found on the PDMP database and has the potential to reduce adverse health outcomes (Dowell et al., 2016b).

While there are many benefits to use of the PDMP, there are also some limitations. PDMP regulations are dependent upon each state and are operated independently (Ayres & Jalal, 2018; Clack et al., 2018). Depending on the state's PDMP regulations, states vary regarding when their PDMPs are updated ranging from "real time" to monthly (CDC, 2017c). Therefore, more consistent and timely PDMP data entry can strengthen the utility of the database.

Both the CDC (2017c) and Ayres & Jalal (2018) state that in order to maximize the benefits of the PDMP, healthcare providers should check the patient's PDMP profile prior to prescribing any opioid. At this point, only 37 states require the PDMP to be checked prior to prescribing an opioid to patients (Clack et al., 2018). The CDC also recommends the PDMP to be checked every three months and periodically for patients who are being managed with opioids

for chronic pain (Dowell et al., 2016b). Therefore, standardization and maximum use of the PDMP through mandated provider review can assist in minimizing the opioid epidemic.

According to Matthews and Fellers (2016), many states have adopted the utilization of the PDMP without hesitation; however, providers have been more hesitant to use them. Providers are aware of the tool to improve prescriptive practices, but PDMPs are not utilized to their potential. Contributing factors to insufficient PDMP utilization include limited time, incomplete education regarding the program, and lack of confidence on what to do with results that are shown. Dowell et al. (2016b) reports certain states allow other members of the healthcare team to access the PDMP other than the provider, and this has been found to decrease providers' workload and potentially enhance PDMP use. In North Dakota, providers can use a delegate, such as a registered nurse, to check the PDMP (North Dakota Board of Pharmacy, 2019).

Pill counts. Another method used to assist in adherence to opioid pain management is completed by performing pill counts. Pill counting is fulfilled by having the patient bring in their prescribed opioids during an outpatient visit, and the healthcare provider will verify the number and type of opioid pills match the patient's medical record (Handre, 2017). This strategy seems to be specifically helpful when the healthcare provider is concerned about patients diverting opioids or consuming opioids in a binging pattern. Guidelines recommend that healthcare providers perform pill counts randomly and with short notice (Matthews & Fellers, 2016). Pill counting is another tool that can be used by healthcare providers in partnership with pharmacists to ensure patients are taking their opioids as prescribed (Handre, 2017).

There is limited information regarding the success of pill counting. Matthews and Fellers (2016) and the American Pain Society guideline (2009) agreed that more research needs to be implemented in relation to the effectiveness of pill counting. In fact, providers have been blamed

for stealing medications when patients are short pills when a pill count is performed. Due to this accusation, one recommendation is to have witnesses in the room while pill counts are being performed, and only the patient is recommended to touch their medication (Matthews & Fellers 2016). Implementation of pill counts needs to be furthered studied to verify the value and clinical utility of this intervention.

Past medical history. There are known risk factors for opioid dependence including patients who have a medical history of substance abuse, including illicit drug use and alcohol dependence (AMDG, 2015; Dowell et al., 2016b; Matthews & Fellers, 2016). Patients with a diagnosis of a mental health disorder are also more likely to experience opioid misuse, abuse, and overdose. Healthcare providers need to make sure to obtain a thorough medical history with questions pertaining to a patient's drug and alcohol use. Due to the complexity, if a patient admits to substance abuse, healthcare providers may want to consider a referral to a pain specialist in order to aid in managing the patient's chronic pain. Patients who are suffering from mental health disorders, including depression and anxiety, need to be monitored closely and should have their mental health disorder treatment regimen maximized prior to initiating an opioid for pain management. These patients also may benefit more from a TCA or SNRI for control of their chronic pain (Dowell et al., 2016b). A thorough understanding of patients' past medical history is essential for healthcare providers prior to prescribing opioid therapy.

Naloxone. A medication that has recently gained increasing popularity is Naloxone, which is also known as Narcan. Naloxone is administered to patients who are showing signs of opioid overdose due to the medication's ability to quickly reverse the effects of opioids (Coffin et al., 2016). Naloxone is an opioid antagonist, and healthcare providers can prescribe or offer naloxone to their patients who are also taking prescription opioids. In a study performed by

Coffin et al. (2016), co-prescribing naloxone resulted in fewer emergency room outings for patients. One recommendation is to prescribe naloxone to patients who have an increased risk of overdosing, such as patients who are prescribed greater than 50 morphine equivalents per day, those who are also taking benzodiazepines, patients who have a known history of overdosing, and/or those with a history of substance abuse (Coffin et al., 2017; Dowell et al., 2016a).

Tapering Opioids. When risks of opioid therapy outweigh the benefits, the discussion of tapering opioids is necessary. The opioid should be decreased to the lowest dose possible dose while still remaining effective, and in the ideal scenario, the opioid may eventually be completely discontinued (Murphy et al., 2018). According to Matthews and Fellers (2016), a patient's daily dose of opioids should be decreased by 5% to 10% every week to 28 days. However, for patients who suffer from anxiety or dependence, tapering opioids at a slower pace of three to six months is recommended. To aid in success of tapering opioids, healthcare providers should outline an individualized treatment plan for the patient to follow and encourage frequent follow-ups with their healthcare provider in the clinic (Murphy et al., 2018). Patients may experience clinical manifestations of withdrawal that the patient and healthcare provider need to be aware of, such as increased heart rate and blood pressure, insomnia, chills, muscle cramps, anorexia, and/or diarrhea (Matthews & Fellers, 2016).

Referring Care. Typically**,** a patient's pain is initially managed through their primary healthcare provider by prescribing an analgesic (Matthews & Fellers, 2016). A primary healthcare provider will often refer their patient if they do not respond to the initial treatment. The patient is often referred to a specialty service, for instance, a pain clinic. Patients who are referred to a pain clinic often suffer from moderate to severe pain. Pain clinics offer ways to comprehensively assess and manage patients' pain. Some pain clinics offer a multi-disciplinary

approach by providing services, such as physical and occupational therapy, education, and behavioral interventions.

Adult Learning Theory

Due to the audience of this practice improvement project, the implementation process required knowledge regarding how adults learn. The theory that guided the development of the project, to improve healthcare providers' prescriptive practices and use of tools to aid in reducing opioid misuse, abuse, and overdose, was the adult learning theory. The adult learning theory, also known as, andragogy, was introduced in 1968 by Knowles (Merriam & Bierema, 2014). The significance of the word andragogy is that it refers to helping adults learn. Knowles was the first to present the differences between adult and children as learners. Andragogy helped signify the uniqueness of adult learners and formulated a knowledge base for effective interventions when teaching adults.

The adult learning theory is divided into six assumptions (Merriam & Bierema, 2014). The assumptions were applied and incorporated into the practice improvement project to meet the educational needs of the participants. The following sections will go into further detail of each assumption outlining how each one was applied to the practice improvement project.

The Learner's Self-Concept

The first assumption of andragogy defines the difference between children and adults as learners (Merriam & Bierema, 2014). Children are dependent learners, while on the other hand, adults are independent learners. Adults prefer to be thought of as self-directed and perceived as responsible for oneself. For this practice improvement project, the setting was comfortable and geared towards adults. The participants were able to define a time and place that was most convenient for them. In addition, the education was provided in an environment that allows for

collaboration and feedback. The education was delivered in a manner that enables the participants to engage and share their perspective. Lastly, throughout the educational session, there was time provided for the participants to implement self-directed learning by intervening and discussing their personal thoughts and current prescribing practices.

Experience

The second assumption of andragogy is that adults use their life experiences as a resource for learning (Merriam & Bierema, 2014). A child's life is defined as a combination of external resources, while adults define themselves by their personal experiences. Therefore, an adult's learning is originated from their occupation, hobbies, family, and community. Throughout the process of the practice improvement project being delivered, the participants were encouraged to share their experiences regarding use of the clinic's policies and contracts related to pain and opioids, prescribing opioids, and the tools accessible to them to reduce opioid misuse, abuse, and overdose. The project and education were organized with the goal of keeping the adult participants open-minded to learn from the most up-to-date, evidence-based research, which would allow the participants to apply new concepts to past experiences and assess how they could be improved.

Readiness to Learn

The third assumption of andragogy is that an adult's learning needs are related to their social roles in life (Merriam & Bierema, 2014). For instance, the targeted audience in this practice improvement project was healthcare providers who prescribe medications daily, including opioids, and other healthcare professionals who may assist in the monitoring of patients on opioid therapy, which directly aligns with the project. The project was discussed with the healthcare providers at Northland Health Centers prior to initiation, and there was a strong

interest in the topic. Therefore, this subject is relevant to the healthcare providers' social roles based on the received feedback. In addition to the healthcare providers, the support staff are also vital team members in this practice improvement project, as they work closely with the healthcare providers.

Problem-Centered Orientation

The fourth assumption of andragogy is adult learning is problem-centered, and adults request to apply their knowledge instantly (Merriam & Bierema, 2014). The project aligned with the fourth assumption by making the project relevant to adult learners and educating them on ways to improve their prescriptive practices, which directly relates to their daily clinical practice. Opioid misuse, diversion, and overdose are immediate concerns for many healthcare providers and professionals. By providing problem-centered education, the participants are able to implement what they learned from the practice improvement project into their practice immediately, and this may help to solidify their learning.

Internal Motivation

The fifth assumption of andragogy is adults are known as internal learners rather than external learners (Merriam & Bierema, 2014). Adults have the opportunity to choose what they want to learn, instead of being told when they need to learn. The project met the expectations of the fifth assumption by giving the participants the choice to participate in this practice improvement project. In addition, the participants shared their interest in this topic prior to presenting the practice improvement project, which may have resulted in participants being more internally motivated.

The Need to Know

The sixth assumption of the andragogy is adults need to know the purpose behind why they need to learn something (Merriam & Bierema, 2014). Adults must be aware of why they need to know the information prior to presenting the practice improvement project, and having an understanding of the need for the information will increase their motivation. The practice improvement project supported the sixth assumption because the targeted participants previously expressed their concern regarding prescribing opioids and the need to increase their knowledge and confidence on this topic.

Iowa Model of Evidence-Based Practice

The theoretical model used for this practice improvement project is the Iowa Model of Evidence-Based Practice. The Iowa Model assists providers to identify clinical problems and facilitates utilization of problem-solving steps to guide implementation and incorporate evidence-based change into the primary care setting (MeInyk & Fineout-Overholt, 2015). Integrating evidence-based care into a healthcare provider's practice will improve the quality of healthcare, increase patient satisfaction, and decrease adverse events within the organization (Spruce & White, 2015).

The Iowa Model is well-known for its applicability and simplicity of use by the healthcare team (MeInyk & Fineout-Overholt, 2015). The model is broken down into a step-by-step fashion starting with selecting a significant topic or "triggers" that come about from providers questioning the current practice guideline. Following the identification of a priority problem, a team is formed that is responsible for thoroughly reviewing and analyzing available research to assess and support the change. After the research is synthesized, the design for the implementation of the pilot change in practice is created, implemented, and evaluated. Lastly, if

the evaluation of the pilot change is appropriate for adoption by the organization and promotes positive outcomes, incorporation of the practice change is facilitated. Furthermore, the evidence-based practice changes need to be continuously evaluated, and the results are to be disseminated within the organization and to outside sources to promote knowledge and inspire other organizations to utilize evidence-based practice changes. A visual representation of the Iowa Model is provided in Appendix A and permission of use in Appendix B.

Topic Selection

The initial step in the Iowa Model is to select a topic, which was selected by identifying a problem among healthcare providers (MeInyk & Fineout-Overholt, 2015). A clinical problem experienced by many healthcare providers is they do not feel confident prescribing opioids for chronic pain management and lack the knowledge and education when it comes to tools that can be utilized to reduce opioid prescribing (Dowell et al., 2016b). Managing patients' chronic pain is a well-known and challenging task. Furthermore, prescribing opioids for chronic pain management creates the potential for patients to misuse, abuse, and overdose on opioids. Educating healthcare providers and implementing the knowledge of the CDC Guideline for Prescribing Opioids for Chronic Pain will likely improve prescriptive practices among healthcare providers. Additionally, ensuring policies and controlled substance treatment agreements mirror best practices, such as the CDC guideline, have the potential to reduce unsafe prescribing practices and enhance patient outcomes.

Organizational Priorities

The importance of decreasing opioid misuse, abuse, and overdose and improving healthcare providers' prescriptive practices in regard to opioids was deemed a priority within the organization. This priority focuses on the people within the community and surrounding area of

Bismarck, North Dakota, including the underserved population. The participating health clinic is Northland Health Centers, which is a non-profit organization and federally qualified family practice clinic. Personal conversations took place with healthcare providers at the participating health clinic, with the providers identifying additional education on opioid prescribing practices and tools to ensure safe prescribing habits as an important need that would strongly benefit their practice. The education was based on the CDC Guideline for Prescribing Opioids for Chronic Pain (Dowell et al., 2016b). In addition, Northland Health Center's policies related to prescribing opioids and pain contracts were discussed with intent to align their policies and contracts with best practices. With focus on improving patient safety and quality of life and increasing healthcare providers' knowledge and confidence regarding opioid prescribing and monitoring, support was received to implement this project at Northland Health Centers.

Team Assembly

The next step in the Iowa Model is to formulate a team (MeInyk & Fineout-Overholt, 2015). The team works together to develop, implement, and evaluate the practice improvement project. In this project, the team consisted of five key stakeholders: a graduate student seeking a doctor of nursing practice (DNP) degree, a family nurse practitioner (FNP) graduate school faculty member, Dr. Allison Peltier (committee chair), two more DNP/FNP graduate school faculty members who hold an interest in the practice improvement project, Dr. Mykell Barnacle and Dr. Kara Falk, and a graduate school appointed faculty member from the North Dakota State University School of Pharmacy, Dr. Daniel Friesner. In addition, the provider supervisor and healthcare providers at Northland Health Centers were vital participants throughout the practice improvement project.

Each stakeholder played an important role throughout this project. The DNP/FNP student led the project by synthesizing the most up-to-date, evidence-based research into a literature review, creating a project design, implementing the project, evaluating the outcomes, and disseminating the findings. In addition, the DNP/FNP student worked closely and collaborated with the committee members. The role of the FNP graduate faculty member and committee chair was to guide and support the DNP/FNP student throughout the practice improvement project by providing advice and suggested changes. The additional two FNP graduate faculty members and graduate school appointed faculty member provided ideas and suggestions on changes to improve the practice improvement project. Their input was appreciated and ultimately allowed the DNP/FNP student to view the project from a different perspective. The position of the participating healthcare providers at Northland Health Centers was to participate in the educational session by taking the pre- and post-tests. This ultimately enabled the DNP/FNP student to obtain data.

Literature and Research

A literature review was conducted as previously discussed and included a number of pertinent topics including chronic pain management, non-pharmacological and non-opioid therapy, opioid therapy, chronic pain management, healthcare providers' prescriptive practices, chronic pain management guidelines, safe prescriptive practices, and gaps in practice. After examining the literature, a gap can be identified in relation to providers' knowledge and confidence in prescribing opioids and utilizing tools in order to ensure safe prescriptive practices (Dowell et al., 2016b). Improvement in healthcare providers' prescriptive practices will aid in reducing opioid abuse, misuse, and overdose. Thus, healthcare providers and support staff benefited from an educational session on the CDC Guideline for Prescribing Opioids for Chronic

Pain and relevant up-to-date literature. In addition, reviewing clinic policies and pain agreements and comparing them to best practice recommendations was essential to improve prescriptive practices among healthcare providers at Northland Health Centers.

Piloting a Practice Change

Implementation of the practice improvement project required planning, including creation of objectives and development of the intervention plan to summarize the DNP/FNP student's purpose for the organization and healthcare providers (MeInyk & Fineout-Overholt, 2015). The purpose of the project was to provide the participants with an educational session on the CDC Guideline for Prescribing Opioids for Chronic Pain and relevant evidence-based research to enhance their knowledge when prescribing opioids.

Evaluating Practice Changes and Dissemination of Results

After the practice improvement project was implemented, the DNP/FNP student evaluated the outcomes. The practice improvement project was evaluated with a pre- and post-test questionnaire that was completed by the healthcare providers. The data was analyzed, which helped to assess and summarize healthcare providers' knowledge regarding prescribing opioids for chronic pain and appropriate monitoring techniques. Additionally, a survey utilizing a Likert scale was provided to assess the participants' confidence in managing chronic pain in a family practice setting. Policies and pain agreements regarding opioids were reviewed with the potential for suggestions for improvement. Demographic information was also obtained from the participating healthcare providers.

The final step of the Iowa model is to disseminate the practice improvement project results (MeInyk & Fineout-Overholt, 2015). Disseminating the results is a vital step in the process to encourage the use of evidence-based practice among the healthcare system. Sharing

results within the organization and community will also increase awareness and knowledge among the healthcare team. After the completion of this practice improvement project, the DNP/FNP student will display the results via poster presentation in spring of 2020. Additionally, the results were recorded via PowerPoint on voicethread.com and shared with the healthcare providers at Northland Health Centers. This will enable healthcare providers and the community to access the results.

CHAPTER THREE. PROJECT DESCRIPTION

Project Design

The CDC guideline was utilized as the supporting base of this practice improvement project, along with numerous evidence-based research studies. Effort was placed on improving healthcare providers' knowledge, confidence, and utilization of practices intended to improve patient safety when prescribing opioids for chronic pain (Dowell et al., 2016b). Healthcare providers are well-trusted individuals who have a meaningful impact on their patients and are expected to be the experts regarding this topic.

Objectives

Healthcare providers are key members to increase awareness and provide education regarding the significance of opioid diversion and misuse. To reduce the potential risks that arise from opioid abuse, healthcare providers need to be confident in their opioid prescribing practices and well-informed on the most recent evidence-based research. A practice improvement project was developed with the goal to achieve the three objectives of the project described below.

Objective one. The first objective was to enhance provider knowledge on opioid prescribing guidelines and evidence-based practices regarding opioids and managing chronic pain. The participants were provided with an educational session on the CDC Guideline for Prescribing Opioids for Chronic Pain and relevant evidence-based research to enhance their knowledge when prescribing opioids. Refer to Appendix C for the educational PowerPoint, Appendix D for education on MME, and Appendix E for case studies. All healthcare providers at each of the nine Northland Health Centers' clinics were invited to the session. In order to assess their increase in knowledge, a pre-test questionnaire was given to participants prior to the implementation of the practice improvement project and was compared with a post-test

questionnaire, which was be completed after the educational session. Refer to Appendix F for pre- and post-test questionnaire.

Objective two. The second objective was to increase the participants' confidence in their ability to manage chronic pain in a family practice clinic. The pre- and post-tests also contained a tool with items measured using a Likert scale. The Likert scale assessed participants' confidence in chronic pain management with opioids, and the results were compared to determine if there was an increase in confidence after the educational session. Refer to Appendix G for Likert-scale.

Objective three. The third objective was to review and update the clinic's policies and pain agreements related to pain and opioids to reflect the CDC guidelines. The intent was to align the policies and contracts with evidence-based research and best prescribing practices. After reviewing the policies and contracts, there was potential changes suggested to the participants and clinic administration during the educational session to improve their policies and pain agreements. The DNP/FNP student presented the potential changes to the participants allowing time for feedback from the participants during the presentation. Refer to appendix H for Northland Health Center's current controlled substance treatment agreement.

Evidence-Based Project

This practice improvement project was formulated by the DNP/FNP student. Below is a more detailed understanding of the project including the setting and participants, evaluation tools, and implementation process.

Setting and participants. The implementation of the practice improvement project took place via Skype at Northland Health Centers. This allowed the DNP/FNP student to reach out to all healthcare providers within Northland Health Centers. Northland Health Centers has nine

clinics located throughout North Dakota. The clinics are predominantly located throughout central, north central and northwestern North Dakota. The population of the rural communities with these clinics range from 411 people to 1,321 people (Cubit, 2020). In addition, the two clinics located in more urbanized areas are Minot and Bismarck with a population of 48,304 and 71,731, respectively. When comparing the rural clinics to the closest urbanized city, the clinics range from 68 to 114 miles from Minot and 62 to 80 miles away from Bismarck. The underserved and rural populations are the individuals who are primarily seen within the clinics. The clinics also offer behavioral health services, and a select few locations offer dental services. The educational session was offered to all healthcare providers who were willing to participate at their monthly meeting on Tuesday, August 20th, 2019 at 9:30 am.

Evaluation tools. A pre- and post-test questionnaire was utilized for the evaluation tools throughout this practice improvement project. The evaluation tools were created by the DNP/FNP student. The Likert survey, which was included within the pre- and post-test questionnaire, was created to assess the healthcare providers' at Northland Health Centers perceived level of confidence regarding safe prescriptive practices and managing chronic pain in a family practice clinic. The Likert survey is a rating scale that will consist of five options for the respondent to choose from. The first option is "Strongly Disagree," second option "Disagree," third option "Neutral," fourth option "Agree," and the fifth option "Strongly Agree."

Secondly, the pre-and post-test questionnaires were also created to assess the knowledge of the healthcare providers prior to and after the educational session. Each test included 14 multiple choice questions. The pre-test was provided to the healthcare providers prior to the educational session. The questionnaire included demographics of the respondents and questions regarding their current practice. The pre-test also evaluated participants' knowledge on opioid

prescribing practices prior to the educational session. The post-test was taken after the educational session. Then, the pre- and post-test questionnaire data was organized and analyzed by the DNP/FNP student. This enabled the DNP/FNP student to determine the respondents' percentage of increase in knowledge. Refer to Appendix I for questionnaire regarding demographics and current practices.

Implementation. The implementation of this practice improvement project occurred on August 20th, 2019 at Northland Health Centers. The estimated length of time of the educational session was 30 minutes. Thirty minutes is the amount of time that the DNP/FNP student was allowed to present by the provider supervisor at Northland Health Centers. One week prior to the educational session, the DNP/FNP student e-mailed a course participation letter and a link to the pre-test questionnaire to the provider supervisor at Northland Health Centers, who then distributed it to all healthcare providers. The pre-test utilized a website, Qualtrics Survey Software. The day before the educational session, the DNP/FNP student sent out another email to remind the healthcare providers about the pre-test. Then, the DNP/FNP student presented the educational session by using PowerPoint software and Skype. The post-test questionnaire was administered following the educational session via email and the Qualtrics Survey Software. Lastly, throughout the educational session, there was time for a discussion regarding the clinic's policies and pain agreements in relation to pain and opioids and how they can be better aligned with the CDC guideline and evidence-based research. Please refer to Appendix J for course participation letter.

In order for healthcare providers and staff at Northland Health Centers to incorporate the CDC Guideline for Opioids for Chronic Pain and relevant evidence-based practice into their daily routine, ongoing evaluation and sustainability needed to be incorporated into the practice

improvement project (MeIynk & Fineout-Overholt, 2015). The DNP/FNP student did this by recording the educational session by creating a voice thread on voicethread.com. The PowerPoint on voicethred.com was set to "public;" therefore, providers are able to access it at any time for their personal reference. This allowed other staff members and providers who may have missed the training to watch the educational session at a later date. In addition, the DNP/FNP student communicated closely and followed-up with the healthcare providers following the educational session, which allowed the DNP/FNP to obtain feedback and to determine how the integration of their knowledge from the educational session has supplemented their practice.

Project Timeline

January 2019

- Complete Literature Review.

February 2019 – June 2019

- Work on and complete proposal.
- Finalize date, time, and location for the educational session at Northland Health Centers.

July 2019

- Present dissertation proposal to obtain approval from dissertation committee.
- Make changes based off of committee review.
- Develop educational session presentation and pre- and post-tests
- Submit IRB application.

August 2019

- Review clinic policies and identify recommended changes.

- Dispense pre-test questionnaire to participants to better understand baseline knowledge regarding guidelines focused on prescribing opioids for chronic pain.
- Present educational session to participants.
- Dispense post-test questionaries' following educational session.
- Analyze data received from pre-and post-tests.
- Continue communication and follow-up with staff every month.

September-December 2019

- Continue data analysis.
- Continue communication and follow-up with staff.
- Prepare final dissertation.

January 2020

- Submit dissertation to chair.
- Prepare for final dissertation defense.

February 2020

- Submit dissertation to committee members.
- Defend final dissertation.

Resources

In order to ensure success when implementing this practice improvement project, a number of resources were utilized throughout the planning, implementation, and evaluation process. The key resources consisted of the clinical dissertation committee, healthcare providers from Northland Health Centers, and technology including PowerPoint software and Qualtrics Survey Software. The cost to complete this practice improvement project is minimal in relation to the importance of this topic.

An intangible resource required to fulfill the requirements of this practice improvement project was time and commitment from the dissertation committee and the healthcare providers at Northland Community Health Centers. The time needed from the healthcare providers included a 30-minute educational session and additional e-mails and/or meetings with the healthcare providers following the educational session. In addition, five to ten minutes was needed from the providers prior to and after the educational session to fill out the pre- and post-test questionnaires.

Evaluation Plan

Evaluating the practice improvement project is an essential step to implement change and improve practice (MeIynk & Fineout-Overholt, 2015). Data was collected in regard to each objective, which will help to assess if the objectives were met. The following sections will go into further detail on how each objective was evaluated.

Objective One

Evaluation of objective one began with a pre-test questionnaire, which was completed prior to the meeting and presenting the educational session for the practice improvement project. After the educational session was completed, a post-test questionnaire was provided. The data was aggregated, and the pre- and post-tests were analyzed to provide the coinvestigator with quantitative data. The quantitative data helped to define if there was an increase in knowledge on evidence-based research guiding opioid prescribing for chronic pain management.

Objective Two

Evaluation of objective two took place before and after the educational session had occurred. Participants were provided with a survey, which utilized the Likert scale, to evaluate their perceived learning and confidence to manage chronic pain with the use of opioids in a

family practice clinic. The Likert survey was provided within the pre- and post-tests. The survey provided the coinvestigator with quantitative data, which offered further information on participants' confidence in their prescriptive practices related to opioids.

Objective Three

Evaluation of objective three took place prior to the educational session, as well as after receiving feedback from healthcare providers during the educational session. The DNP/FNP student compared the family practice clinic's policies and agreements related to pain with the most recent evidence-based research. The DNP/FNP student presented the suggested changes at the educational session. Following the educational session, the DNP/FNP student obtained qualitative data from the participants in regard to the suggested changes. The DNP/FNP student recorded the healthcare providers' responses.

Logic Model

A logic model was created to guide and evaluate the practice improvement project (CDC, 2018). The logic model provides a visual representation of the relationship among the key components necessary for this project. The five components displayed are inputs, activities, outputs, outcomes, and impact. In addition, the logic model presents a clear plan in order to meet the objectives for this practice improvement project. Please refer to Chapter 5 for a representation of the logic model.

Protection of Human Subjects

In order to guarantee the safety and rights of human subjects in this practice improvement project, approval was obtained from the North Dakota State University Institutional Review Board (IRB) before the implementation process. The goal of this project was to improve providers' prescriptive practices; therefore, the project was implemented with healthcare

professionals. There was no patient contact during the project. Additionally, individual patient data and provider names were not obtained throughout this data collection process, as the results of the pre- and post-test surveys were collected in aggregate form. Thus, patient's risk was minimal to no risk at all. Because there was minimal patient contact or risk, an exemption protocol application and required supplemental materials was submitted to the NDSU IRB for review and approval prior to initiation of the project. Please see Appendix K for confirmation of IRB approval.

CHAPTER FOUR. RESULTS

After implementing the practice improvement project, the results were evaluated. The following sections will review the results of the pre- and post-tests questionnaires. The questionnaires included the demographics of the healthcare providers, their current practices and knowledge in regard to prescribing and managing opioids, and a Likert survey to assess healthcare providers' self-confidence. In addition, feedback received during the educational session in relation to the current pain policies and agreements at Northland Health Centers will be reviewed.

Demographics

Questions one and two on the pre-test focused on the demographics of the healthcare providers. There were eight healthcare providers who responded to the pre-test. Of the eight providers, five (62.5%) identified they were formally trained and licensed/registered as nurse practitioners, and three (37.5%) identified themselves as physicians assistants. Five (62.5%) of the healthcare providers reported practicing for less than five years, one (12.5%) reported practicing between five and 10 years, and two (25%) between 11 and 20 years.

There were six healthcare providers who responded to the post-test. Of the six providers, four (66.67%) identified they were formally trained and licensed/registered as nurse practitioners, and two (33.3%) identified themselves as physicians assistants. Four (66.67%) of the healthcare providers reported to practicing for less than five years, one (16.67%) reported practicing between five and 10 years, and one (16.67%) between 11 and 20 years. Table 1 illustrates sample demographics from pre- and post-tests.

Table 1

Sample Demographics Questions and Responses

Question	Response to pre-test (N=8)	Mean (%)	Response to post-test (N=6)	Mean (%)
Profession				
Nurse practitioner	5	62.5%	4	66.67%
Physician	0	0%	0	0%
Physician Assistant	3	37.5%	2	33.3%
Other	0	0%	0	0%
Years in Practice				
Less than 5 years	5	62.5%	4	66.67%
5-10 years	1	12.5%	1	16.67%
11-20 years	2	25%	1	16.67%
More than 20 years	0	0%	0	0%

Current Practices

Questions three through five assessed healthcare providers' current practices including prescribing opioids and pain contracts or pain agreements. Of the eight healthcare providers who responded to the pre-test, three (37.5%) had prescribed to "0 patients" to manage their patients' chronic pain, one (12.5%) had prescribed to "one to two patients," and four (50%) had prescribed to "five or more patients" over the last 12 months. If the healthcare provider had prescribed an opioid for managing chronic pain, five (71.42%) of the healthcare providers responded "yes" to initiating a pain contract or pain agreement, two (28.57%) responded "no" to initiating a pain contract or pain agreement, and one healthcare provider did not respond. Question five is a follow-up to question four. For those healthcare providers who responded "yes" to initiating a pain contract or pain agreement when prescribing opioid, one (14.29%) healthcare provider responded "25% or less" of their patients who are taking opioids for chronic pain have a pain agreement in place, four (57.14%) responded "more than 75%," and two (28.57%) responded "I have not prescribed an opioid for managing chronic pain."

In addition to questions three through five, questions six through eight were used to assess current practices, including barriers, use of evidence-based guidelines, and managing chronic pain. Question six, which was a 'select all that apply' question, asked healthcare providers barriers they have come across when utilizing evidence-based practice. Five (62.5%) healthcare providers responded, "there are no barriers, I follow evidence-based guidelines when prescribing opioids," one (12.5%) responded "there is limited access to evidence-based guidelines in the clinic," and two (25%) offered their own responses. The first healthcare provider wrote "finding other affordable pain control methods for patients to use, which are effective," and another wrote "patients who were prescribed medication inappropriately."

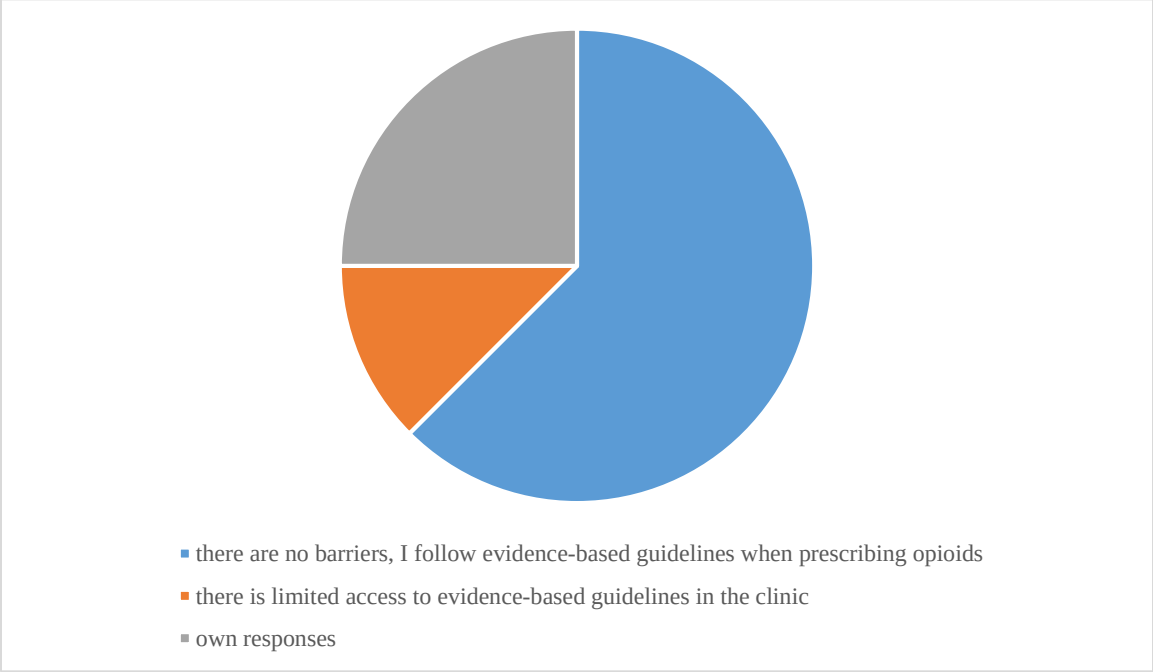

Figure 1. Pre-test: Barriers to evidence-based pain guidelines.

Question seven asked healthcare providers who have prescribed a patient an opioid for managing their chronic pain if they utilized an evidence-based guideline to aid in prescribing an opioid, and if so, to indicate what guideline they used. Three (42.86%) healthcare providers responded "yes" and reported to using "up-to-date guidelines" and "CDC." Three (42.86%)

selected “no,” and one (14.29%) selected “I have not prescribed an opioid for managing chronic pain.” Question eight asked healthcare providers, while earning a graduate degree, if they learned how to manage chronic pain. Three (37.5%) healthcare providers responded “yes” and five (62.5%) responded “no.”

There were six healthcare providers who responded to the post-test. Of the six healthcare providers who responded to the post-test, one (16.67%) had prescribed to “0 patients” to manage their patients’ chronic pain, two (33.33%) had prescribed to “one to two patients,” and three (50%) had prescribed to “five or more patients” over the last 12 months. All of the healthcare providers, five (100%), who had prescribed an opioid for managing chronic pain responded “yes” to initiating a pain contract or pain agreement. Question five is a follow-up to question four. For those healthcare providers who responded “yes” to initiating a pain contract or pain agreement when prescribing opioid, one (20%) healthcare provider responded “51-75%” of their patients who are taking opioids for chronic pain have a pain agreement in place, and four (80%) responded “more than 75%.”

In addition to questions three through five, questions six through eight in the post-test assessed current practices. Question six asked healthcare providers barriers they have come across when utilizing evidence-based practice. This question was a ‘select all that apply’ question. Three (37.5%) healthcare providers responded, “there are no barriers, I follow evidence-based guidelines when prescribing opioids,” two (25%) selected “lack of time,” two chose “evidence-based guidelines are not easy to follow,” and one (12.5%) selected “there is limited access to evidence-based guidelines in the clinic.”

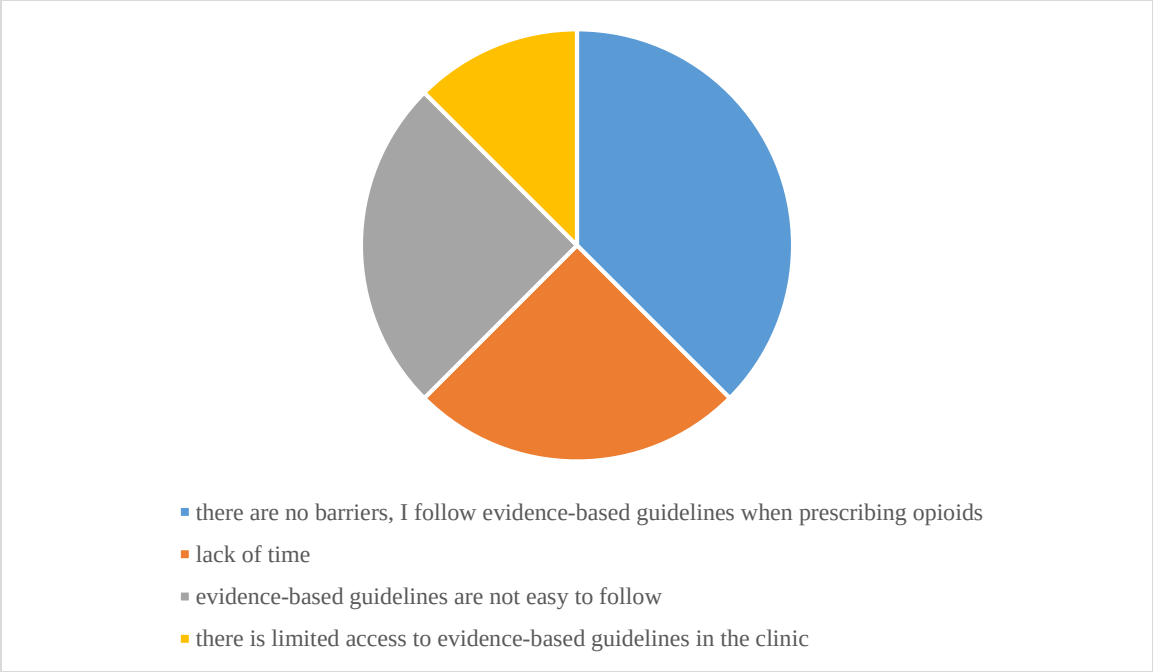

Figure 2. Post-test: Barriers to evidence-based pain guidelines.

Question seven asked healthcare providers who have prescribed a patient an opioid for managing their chronic pain if they utilized an evidence-based guideline to aid in prescribing an opioid, and if so, to indicate what guideline they used. Three (50%) healthcare providers responded "yes," and one reported to using "up-to-date guidelines," while the other two utilized the "CDC." Two (33.33%) selected "no," and one (16.67%) selected "I have not prescribed an opioid for managing chronic pain." Question eight asked healthcare providers, while earning a graduate degree, if they learned how to manage chronic pain. Two (33.33%) healthcare providers responded "yes," and four (66.67%) responded "no." Table 2 illustrates sample current practices from pre- and post-tests.

Table 2

Sample Current Practices Questions and Responses

Question	Response to pre-test (N=8)	Mean (%)	Response to post-test (N=6)	Mean (%)
Over the last 12 months, for approximately how many patients have you prescribed an opioid to manage their chronic pain?				
0 patients	3	37.5%	1	16.67%
1-2 patients	1	12.5%	2	33.33%
3-4 patients	0	0%	0	0%
5 or more patients	4	50%	3	50%
If you have prescribed a patient(s) an opioid for managing their chronic pain, was a pain contract or pain agreement initiated?				
Yes	5	71.43%	5	100%
No	2	28.57%	0	0%
If you answered "yes" to the previous question, what percentage of your patients who are taking opioids for chronic pain have a pain agreement in place?				
25% or less	1	14.29%	0	0%
25-50%	0	0%	0	0%
51-75%	0	0%	1	20%
More than 75%	4	57.14%	4	80%
I have not prescribed an opioid for managing chronic pain.	2	28.57%	0	0%
What are barriers you have come across to using evidence based guidelines when prescribing opioids for in a family practice clinic? (Select all that apply).				
There are no barriers. I follow evidence-based guidelines when prescribing opioids.	5	62.5%	3	50%
Lack of time.	0	0%	2	33.3%
Evidence-based guidelines are not easy to follow.	0	0%	2	33.3%
There is limited access to evidence-based guidelines in the clinic.	1	12.5%	1	16.67%
Other, please explain.	2	25%	0	0%
If you have prescribed a patient(s) an opioid for managing their chronic pain, did you use an evidence-based guideline to aid in prescribing the opioid?				
Yes, please indicate the guideline used	3	42.86%	3	50%
No	3	42.86%	2	33.33%
I have not prescribed an opioid for managing chronic pain	1	14.29%	1	16.67%
While earning your graduate degree, did you learn how to manage chronic pain?				
Yes	3	37.5%	2	33.3%
No	5	62.5%	4	66.67%

Objective One: Healthcare Provider Knowledge

Questions one through six on the pre- and post-tests asked the providers about their current knowledge regarding prescribing opioids for chronic pain and the CDC Guideline for Prescribing Opioids for Chronic Pain. Question one asked the healthcare providers to select which patient had the greatest risk of experiencing chronic pain according to the research. Of the eight healthcare providers who responded to the pre-test, six (75%) of the healthcare providers selected "a male who has a low annual income," and two (25%) selected "a female who has a low annual income," which is the correct answer. There were six healthcare providers that responded to the post-test. Two (33.33%) of the healthcare providers selected "a male who has a low annual income," and four (66.67%) selected "a female who has a low annual income" on the post-test. The percentage of participants who were correctly able to identify risk factors for chronic pain increased as a result of the educational session.

Questions two through four were constructed from the CDC guideline. Question two asked how often the PDMP should be reviewed when prescribing opioids for chronic pain. One (12.5%) healthcare provider selected "when initiating opioid therapy and chronic pain management, sporadically, and ranging from each prescription to every 3 months," three (37.5%) chose "when initiating opioid therapy, each prescription, and annually," and four (50%) selected "when initiating opioid therapy, each prescription, and every 6 months." The correct answer is when initiating opioid therapy and chronic pain management, sporadically, and ranging from each prescription to every 3 months. All six (100%) healthcare providers selected "when initiating opioid therapy and chronic pain management, sporadically, and ranging from each prescription to every 3 months" on the post-test, which demonstrates an improved understanding of PDMP utilization after the educational session.

Question three asked for the providers to select which statement was false according to the CDC Guideline for Prescribing Opioids for Chronic Pain: five (62.5%) selected "healthcare providers should prescribe long-acting opioids when initiating opioids for chronic pain rather than short-acting," two (25%) selected "patients should be restricted to 50 mg morphine equivalents per day when being started on opioid therapy," and one (12.5%) selected "opioids are not first-line for managing chronic pain." The correct answer is "healthcare providers should prescribe long-acting opioids when initiating opioids for chronic pain rather than short-acting." On the post-test, five (83.33%) providers selected "healthcare providers should prescribe long-acting opioids when initiating opioids for chronic pain rather than short-acting," and one provider (16.67%) selected "opioids are not first-line for managing chronic pain." Due to the educational session, the participants' understanding of recommendations from the CDC Guideline for Prescribing Opioids for Chronic Pain was enhanced.

Question four asked the healthcare providers how often the risks and benefits should be reviewed for opioid therapy and pain management with the correct answer being every 3 months throughout therapy. On the pre-test, one (12.5%) selected "every 6 months throughout therapy," one (12.5%) selected "annually," and six (75%) selected "every 3 months throughout therapy." On the post-test, one (12.5%) selected "on an as needed basis," and five (83.33%) selected "every 3 months throughout therapy." The improvement in scores demonstrates more healthcare providers became knowledgeable regarding how often risks and benefits should be reviewed for patients on opioid therapy for chronic pain management.

Question five asked the healthcare providers which statement is true regarding urine drug screening and opioids and was a 'select all that apply' question. The correct answers were "urine drug screens can help to detect use of prescribed opioids, or if a patient is not using the opioids

prescribed to them, which may indicate diversion of opioids" and "urine drug screening should be initiated prior to opioid therapy." On the pre-test, all of the eight healthcare providers (100%) selected "urine drug screens can help to detect use of prescribed opioids, or if a patient is not using the opioids prescribed to them, which may indicate diversion of opioids," six (75%) selected "urine drug screening should be initiated prior to opioid therapy," and one (12.5%) selected "healthcare providers continue to over utilize urine drug screening when managing patients' chronic pain." On the post-test, all of the six healthcare providers (100%) selected "urine drug screens can help to detect use of prescribed opioids, or if a patient is not using the opioids prescribed to them, which may indicate diversion of opioids," and five (83.33%) selected "urine drug screening should be initiated prior to opioid therapy." As a result of the educational session, healthcare providers were able to more accurately identify the role of urine drug screens in chronic pain management.

Question six discussed tapering opioids and how often a patient's daily dose should be tapered with the correct answer being decreased by 5-10% every week to 28 days. On the pre-test, three (37.5%) healthcare providers selected "decreased by 50% every week to 28 days," four (50%) selected "25-30% every week to 28 days," and one (12.5%) selected "decreased by 5-10% every week to 28 days." On the post-test, all of the six healthcare providers (100%) selected "decreased by 5-10% every week to 28 days." The results demonstrate an enhanced understanding of tapering opioids after the educational session. Table 3 illustrates sample knowledge questions from pre- and post-tests.

Table 3

Sample Knowledge Questions and Responses

Question	Response to pre-test (N=8)	Mean (%)	Response to post-test (N=6)	Mean (%)
Which of the following patients has the greatest risk of experiencing chronic pain?				
A male who has a low annual income.	6	75%	2	33.3%
A male who has a high annual income.	0	0%	0	0%
A female who has a low annual income.	*2*	*25%*	*4*	*66.67%*
A female who has a high annual income.	0	0%	0	0%
According to the CDC Guideline for Prescribing Opioids for Chronic Pain, when should the PDMP be reviewed?				
When initiating opioid therapy for chronic pain management, sporadically, and ranging from each prescription to every 6 months.	0	0%	0	0%
When initiating opioid therapy for chronic pain management, sporadically, and ranging from each prescription to every 3 months.	*1*	*12.5%*	*6*	*100%*
When initiating opioid therapy, each prescription, and annually.	3	37.5%	0	0%
When initiating opioid therapy, each prescription, and every 6 months.	4	50%	0	0%
According to the CDC Guideline for Prescribing Opioid for Chronic Pain, which of the following is false.				
Healthcare providers should prescribe long-acting opioids when initiating opioids for chronic pain rather than short-acting.	*5*	*62.5%*	*5*	*83.33%*
Patients should be restricted to 50 mg morphine equivalents per day when started on opioid therapy.	2	25%	0	0%
Opioids are not first-line for managing chronic pain.	1	12.5%	1	16.67%
Long term use of opioids often begins when patients are being treated for their acute pain.	0	0%	0	0%

Table 3. *Sample Knowledge Questions and Responses* (continued)

Question	Response to pre-test (N=8)	Mean (%)	Response to post-test (N=6)	Mean (%)
According to the CDC Guideline for Prescribing Opioids for Chronic Pain, the healthcare provider should review the risks and benefits of opioid therapy for pain management:				
Every 6 months throughout therapy	1	12.5%	0	0%
Annually	1	12.5%	0	0%
On an as needed basis	0	0%	1	16.67%
Every 3 months throughout therapy	*6*	*75%*	*5*	*83.33%*
Which of the following are true regarding urine drug screening and opioids? (Select all that apply).				
Urine drug screens will detect the amount of opioids taken by the patients.	0	0%	0	0%
Urine drug screens can help to detect use of prescribed opioids, or if a patient is not using the opioids prescribed to them, which may indicate diversion of opioids.	*8*	*100%*	*6*	*100%*
Urine drug screening should be initiated prior to opioid therapy	*6*	*75%*	*5*	*83.33%*
Healthcare providers continue to over utilize urine drug screening when managing patients' chronic pain.	1	12.5%	0	0%
When tapering opioids, a patient's daily dose of opioids should be:				
Decreased by 75% every week to 28 days	0	0%	0	0%
Decreased by 50% every week to 28 days	3	37.5%	0	0%
Decreased by 25-30% every week to 28 days	4	50%	0	0%
Decreased by 5 to 10% every week to 28 days	*1*	*12.5%*	*6*	*100%*

Objective Two: Healthcare Provider Confidence

Prior to and following the educational session, healthcare providers were given a Likert survey to evaluate their self-confidence, which addressed objective two. To recall, objective two was to increase healthcare providers' confidence when managing chronic pain in a family

practice setting. Table 4 illustrates the results from the pre- and post-test self-confidence evaluation survey; the post-test results are italicized and are located below the pre-test findings.

Pre-test Self-Confidence Evaluation Survey

There were eight healthcare providers who responded to the self-confidence evaluation survey within the pre-test. Of the eight, regarding statement one, "I am confident in my ability to prescribe opioids for chronic pain," six (75%) selected "somewhat agree" and one (12.5%) selected "neither agree nor disagree." For statement two, which is "I am confident in my ability to assess, diagnose, and manage patients' chronic pain," seven (87.5%) healthcare providers selected "somewhat agree," and one (12.5%) selected "somewhat disagree." Statement three reads "I am confident in knowing the potential adverse effects that are associated with opioid use," and statement four reads "I am confident in knowing the potential harms associated with opioid use." Statement three and four had the same results with six (75%) healthcare providers selecting "strongly agree" and two (25%) selecting "somewhat agree."

All providers (100%) selected "strongly agree" on statement five regarding their ability to use the PDMP. For statement six, "I am confident in my ability to accurately read a urine drug screen," five (62.5%) healthcare providers selected "strongly agree," and three (37.5%) selected "somewhat agree." In regard to statement seven, "I am confident in my ability to initiate and maintain an opioid therapy agreement," two (25%) healthcare providers chose "strongly agree," five (62.5%) chose "somewhat agree," and one chose (12.5%) "neither agree nor disagree." For statement eight, "I am confident in my ability to obtain a thorough medical history including questions pertaining to a patient's drug and alcohol use," five (62.5%) healthcare providers chose "strongly agree," two (25%) "somewhat agree, and one (12.5%) "somewhat disagree." Statement nine, "I am confident in my ability to taper opioids when

necessary," had three (37.5%) healthcare providers select "strongly agree," two (25%) "somewhat agree" and three (37.5%) "somewhat disagree." Lastly, statement ten reads, "I am confident in my ability to determine when it is appropriate to refer my patients to pain management specialists." Four (50%) healthcare providers selected "strongly agree," and four (50%) selected "somewhat agree."

Post-test Self-Confidence Evaluation Survey

There were six healthcare providers who responded to the self-confidence evaluation survey within the post-test. Of the six, regarding statement one, "I am confident in my ability to prescribe opioids for chronic pain," two (33.3%) healthcare providers selected "strongly agree," three (50%) selected "somewhat agree," and one selected (16.67%) "neither agree nor disagree." The results for statement two, which is "I am confident in my ability to assess, diagnose, and manage patients' chronic pain" and statement seven, which is "I am confident in my ability to initiate and maintain an opioid therapy agreement" were the same, as three (50%) healthcare providers selected "strongly agree," and three selected (50%) "somewhat agree." Statement three reads "I am confident in knowing the potential adverse effects that are associated with opioid use" and statement four reads "I am confident in knowing the potential harms associated with opioid use." Statement three and four had the same results with five (83.33%) healthcare providers selecting "strongly agree" and one selecting (16.67%) "somewhat agree." All providers (100%) selected "strongly agree" on statement five regarding their ability to use the PDMP. For statement six, "I am confident in my ability to accurately read a urine drug screen," five (83.33%) healthcare providers selected "strongly agree," and one selected (16.67%) "somewhat agree." For statement eight, "I am confident in my ability to obtain a thorough medical history including questions pertaining to a patient's drug and alcohol use," four

(66.67%) healthcare providers chose “strongly agree,” and two (33.3%) selected “somewhat agree.” Statement nine, “I am confident in my ability to taper opioids when necessary,” had three (50%) healthcare providers select “strongly agree,” one (16.67%) “somewhat agree,” one (16.67%) “neither agree nor disagree,” and one (16.67%) “somewhat disagree.” Lastly, statement ten reads, “I am confident in my ability to determine when it is appropriate to refer my patients to pain management specialists.” Four (66.67%) healthcare providers selected “strongly agree,” and two (33.33%) selected “somewhat agree.”

In summary when comparing the pre- and post-tests, the participants’ confidence is their ability to assess, diagnose, and manage patients’ chronic pain increased after the educational session. On the other hand, participants felt confident with their ability to utilize the PDMP before the educational session, and this did not change after the education. While the percentage of participants who reported feeling confident in tapering opioids increased after the education, opioid tapering is an area in which participants continue to report reduced confidence compared to other areas of opioid therapy.

Table 4

Self-confidence Evaluation Survey, Questions 1-10

Statement	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I am confident in my ability to prescribe opioids for chronic pain.	0 (0%) *2 (33.3%)*	6 (75%) *3 (50%)*	1 (12.5%) *1 (16.67%)*	1 (12.5%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to assess, diagnose, and manage patients' chronic pain.	0 (0%) *3 (50%)*	7 (87.5%) *3 (50%)*	0 (0%) *0 (0%)*	1 (12.5%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in knowing the potential adverse effects that are associated with opioid use.	6 (75%) *5 (83.33%)*	2 (25%) *1 (16.67%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in knowing the potential harms associated with opioid use.	6 (75%) *5 (83.33%)*	2 (25%) *1 (16.67%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to utilize the PDMP.	8 (100%) *6 (100%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to accurately read a urine drug screen.	5 (62.5%) *5 (83.33%)*	3 (37.5%) *1 (16.67%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to initiate and maintain an opioid therapy agreement.	2 (25%) *3 (50%)*	5 (62.5%) *3 (50%)*	1 (12.5%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to obtain a thorough medical history including questions pertaining to a patient's drug and alcohol use.	5 (62.5%) *4 (66.67%)*	2 (25%) *2 (33.3%)*	0 (0%) *0 (0%)*	1 (12.5%) *0 (0%)*	0 (0%) *0 (0%)*
I am confident in my ability to taper opioids when necessary.	3 (37.5%) *3 (50%)*	2 (25%) *1 (16.67%)*	0 (0%) *1 (16.67%)*	3 (37.5%) *1 (16.67%)*	0 (0%) *0 (0%)*
I am confident in my ability to determine when it is appropriate to refer my patients to pain management specialists	4 (50%) *4 (66.67%)*	4 (50%) *2 (33.33%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*	0 (0%) *0 (0%)*

Magnitude of the Shift from Pre- to Post-test

Another example to show the healthcare providers' increase in confidence level, when comparing the pre- to the post-test, was by calculating the magnitude of the shift. To calculate this, each option was given a numerical value. "Strongly agree" represents a value of 5,

"somewhat agree" a 4, "neither agree nor disagree" a 3, "somewhat disagree" a 2, and "strongly disagree" a 1. Each statement's scores were added up from the pre- and post-test and divided by the number of people who completed the pre- and post-test; this determined the magnitude of the shift. Overall, there was an increase in the magnitude of the shift seen in nine statements. The only statement this was not seen in was statement five, as there was no change. Statement five discusses the healthcare providers' confidence in their ability to utilize the PDMP.

Table 5

Magnitude of the Shift for the Self-confidence Evaluation Survey, Questions 1-10

Statement	Pre-test	Post-test
I am confident in my ability to prescribe opioids for chronic pain.	3.625	4.17
I am confident in my ability to assess, diagnose, and manage patients' chronic pain.	3.75	4.5
I am confident in knowing the potential adverse effects that are associated with opioid use.	4.75	4.83
I am confident in knowing the potential harms associated with opioid use.	4.75	4.83
I am confident in my ability to utilize the PDMP.	5	5
I am confident in my ability to accurately read a urine drug screen.	4.75	4.83
I am confident in my ability to initiate and maintain an opioid therapy agreement.	4.125	4.5
I am confident in my ability to obtain a thorough medical history including questions pertaining to a patient's drug and alcohol use.	4.375	4.67
I am confident in my ability to taper opioids when necessary.	3.625	4
I am confident in my ability to determine when it is appropriate to refer my patients to pain management specialists	4.5	4.67

Objective Three: Pain Policies and Agreements

During the educational session, the healthcare providers were asked about their current policies and pain agreements or pain contracts related to pain and opioids. When the DNP/FNP student asked about their current policies and pain agreements the following were responses from the healthcare providers:

> "We don't have a specific policy [when managing chronic pain]."
>
> - Healthcare provider participant

-

> "You can't lump all chronic pain together [into one policy] there is back pain, which there is conservative measures for, there is fibromyalgia, which there is conservative measures for. You couldn't do a conservative measure for all chronic pain in one policy."
>
> - Healthcare provider participant

> "In general, like chronic back pain, there are universal guidelines…"
>
> - Healthcare provider participant

As one of the healthcare providers stated, there is not a current policy related to managing chronic pain. However, the DNP/FNP student did review their pain agreement. The pain agreement is comprised of 18 conditions and risks and complications of opioid medications. The patient has to sign the pain agreement prior to beginning the opioid medication. In addition, there is a place for the witness and primary care provider to sign, and a place to include the pharmacy's name and address. Furthermore, the document states failure to comply with the pain agreement will cause discontinuation of the opioid medication.

After reviewing the pain agreement, the coinvestigator did present some suggested changes at the educational session. To summarize, the suggested changes consisted of having healthcare providers check the PDMP prior to opioid therapy and to perform a urine drug screen prior to initial opioid prescriptions. Furthermore, the coinvestigator proposed to have a policy, which aligns with the CDC Guideline for Prescribing Opioids for Chronic Pain. The following responses were recorded during the educational session.

> "That would be a great generic policy to come up with."
>
> - Healthcare provider participant

> "I remember when I first started here, we do have…if we have any controlled substances, you know benzos or Adderall, things like that where we have that pain contract that we would have them sign and I think in there it does talk about, I haven't pulled that policy for a while, but it does talk about reviewing PDMP and I think there is something about urine drug but I'm not positive."
>
> - Healthcare provider participant

"Next Gen [computer software program] actually won't let you prescribe without pulling the PDMP. It automatically pulls."

- Healthcare provider participant

"As far as I know, we only have a policy for once we have determined the need for long term opioid use or controlled substance. We don't have anything prior to that point."

- Healthcare provider participant

"I think in general, almost anybody at this point prescribing are doing the PDMP drug screens and contract. I think that's pretty standard of care."

- Healthcare provider participant

CHAPTER FIVE. DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

In summary, gaps in knowledge continue to exist related to recommended opioid prescribing practices. Prior to the educational session, knowledge deficits were identified among healthcare providers in regard to their ability to identify patients at risk for chronic pain, utilize the PDMP according to recommendations, and taper opioids. While the percentage of participants that answered these questions on the post-test increased, there continues to be gaps in knowledge related to the understanding of the CDC Guideline for Prescribing Opioids for Chronic Pain.

Previous literature discussed gaps including insufficient training on the tools provided to healthcare providers to ensure safe prescribing habits and lack of education when caring for patients who are suffering from chronic pain (Dowell et al., 2016; Upshur et al., 2006). In addition to educational gaps, the findings from this practice improvement project reveal that healthcare providers continue to lack confidence in certain areas related to chronic pain management, including opioid tapering. Furthermore, a gap in clinical practice was identified, as the clinic did not have a policy when it came to managing chronic pain, and their pain agreement did not completely align with the 2016 CDC Guideline for Prescribing Opioids for Chronic Pain. According to O'Donnell and Vogenberg (2012), when policies and procedures are written correctly, this can lead to a safer environment and help to maximize efficiency.

The purpose of this practice improvement project was to utilize evidence-based research and the CDC Guideline for Prescribing Opioids for Chronic Pain to improve healthcare providers' knowledge and confidence when prescribing opioids for chronic pain and managing

chronic pain in a family practice clinic. A synthesis of the main findings and results of each objective were interpreted and are reviewed below.

Objective One

Objective one was aimed at increasing healthcare providers' knowledge regarding opioid prescribing guidelines and evidence-based practices regarding opioids and managing chronic pain. Provenzano, Kamal, and Giannetti (2018) found that 67% of healthcare providers do not refer to guidelines when managing their patients' pain with pharmaceuticals, which demonstrates the need to educate healthcare providers on the most recent, evidence-based guidelines. Comparing the selected answers to the knowledge-based questions from the pre-test to the post-test, revealed an overall increase in percentage of healthcare providers answering the questions correctly. Most notably, the second and sixth question in the knowledge-based question section, which focused on PDMP utilization and opioid tapering respectively, went from 12.5% of the participants answering the question correctly to 100% of the participants answering the question correctly. In addition, question one, which discussed identifying patients who are at greatest risk for experiencing chronic pain, went from 25% to 66.7% of the healthcare provider participants answering correctly.

The topic of questions three and four was the CDC Guideline for Prescribing Opioids for Chronic Pain. An increase on the post-test was also noted on question three, which increased from 62.5% to 83.33%. The number of correct answers increased on question four from 75% on the pre-test to 83.33% on the post-test. Question five was a 'select all that apply' question on the topic of urine drug screens, and the correct answers were answered 100% of the time with one answer and went from 75% to 83.33% on the second answer. Overall, the survey results demonstrated an increase in knowledge in regard to identifying patients who are at greatest risk

of experiencing chronic pain, when to review the PDMP, the CDC Guideline for Prescribing Opioid for Chronic Pain, urine drug screens, and tapering opioids.

Objective Two

The second objective aimed at increasing healthcare providers' confidence in their ability to manage chronic pain in a family practice clinic, which is essential as healthcare providers report inadequate confidence related to chronic pain management. In fact, Pearson, Moman, Moeschler, Eldrige, and Hooton (2017) found that 60.8% of the healthcare providers in their study reported not feeling confident in managing their patients' chronic pain. Based on the overall results of the self-confidence evaluation survey, there was an increase in percentage in the "strongly agree" section when comparing the pre- to the post-test. The increase in percentage and magnitude of the shift was seen in nine statements. There were no healthcare providers who selected that they "strongly disagree" to the statement reflecting their self-confidence throughout the pre- and post-test. An increase in confidence was noted as none (0%) of the healthcare providers strongly agreed on the pre-test that they felt confident in their ability to manage chronic pain; however, on the post-test, two (33.3%) of the healthcare providers strongly agreed with this statement.

On the other hand, healthcare providers already felt confident in how to use the PDMP prior to the intervention with 100% of the participants strongly agreeing to this statement. Therefore, an increase in confidence related to the PDMP was not seen, nor was there an increase in the magnitude of the shift in this statement. Ability to use the PDMP is essential because the majority of overdoses resulting in fatality have occurred because patients were receiving prescriptions from multiple providers (Dowell et al., 2016b). Use of the PDMP may help eliminate prescriptions from multiple providers and reduce opioid-related overdose deaths.

Objective Three

The third objective aimed at reviewing and updating the clinic's policies and pain agreements related to pain and opioids. As previously discussed, the clinic does not have a policy related to managing chronic pain; however, the clinic does have a pain agreement. Although no definitive changes were made to their pain agreements, the provider supervisor was supportive of possibly implementing a policy regarding managing chronic pain in the clinic's future.

One suggestion made by the coinvestigator to the healthcare providers was to include a statement that the patient understands the healthcare provider will be checking the PDMP prior to initiating opioid therapy, as this is a recommendation from the CDC guideline (Dowell et al., 2016b). In addition, the PDMP should be checked with each prescription every three months. The current pain agreement does not discuss use of the PDMP. Another suggestion was to have the policy require a urine drug screen prior to writing the initial opioid prescription (Dowell et al., 2016b). The current agreement states, "I understand that I may be asked, at the discretion of my NCHC medical provider, for a urine or blood test and that I am required to complete within 72 hours of notification by the provider. I agree to be subject to annual drug screen at any time chose by my provider per NCHC policy."

Due to the clinic not having a policy regarding managing chronic pain with opioid therapy, the coinvestigator created a written list of recommendations that should be included within the clinic's policy, if one is created in the future. The list of recommendations reflects the CDC Guideline for Prescribing Opioids for Chronic pain and the most recent evidence-based research. This list was sent to the provider supervisor. Please refer to appendix M for further details.

In addition, a gap was identified during the educational session. Many healthcare providers were unclear if there was a policy when managing a patient's chronic pain or what the clinic's current pain agreement entailed. The conversation held during the educational session allowed all healthcare providers at Northland Health Centers to be aware of the current pain contract. Increased awareness of the current pain contract is beneficial because healthcare providers report feeling more confident in managing patients' chronic pain when following a protocol, as this facilitates a more consistent approach to opioid therapy (Pearson et al., 2017).

Logic Model

Inputs within this practice improvement project included what went into this project in order to generate success (CDC, 2018). The inputs encompassed were time, key stakeholders, CDC's guidelines, most recent evidence-based research, and the space and location for the educational session. Furthermore, the activities entailed events that took place by the coinvestigator in order to achieve the necessary outcomes. In summary, the activities included hours of research, creating a pre- and post-test and PowerPoint educational session, and recording the educational session for a future reference for the healthcare providers. Moreover, outputs are the results from the activities, and the outcomes are the desired results. The desired results were to increase participating healthcare providers' knowledge and confidence when prescribing opioids and managing chronic pain. Lastly, the impact is the ultimate goal, which was to address and help eliminate the gap in the clinical setting that healthcare providers do not feel confident when prescribing opioids by providing an educational session and increasing their knowledge on this topic. Furthermore, the goal consisted of bringing awareness to the healthcare providers in regards to the clinic's pain agreements and policies and aligning them with the CDC's guidelines.

Figure 3. Logic model.

Project Limitations

After implementing and evaluating the practice improvement project, limitations were noted. Limitations that were identified within this project include a small sample size and the lack of in-person contact. In addition, there was a response rate difference between the pre- and post-tests. Furthermore, the coinvestigator chose the setting and was familiar with one of the participating healthcare providers.

The first limitation in this practice improvement project includes the small sample size of healthcare providers, which affects the generalizability of the results. The practice improvement project was initially intended for ten healthcare providers. However, one healthcare provider did not attend the monthly meeting that day. Therefore, nine healthcare providers attended the meeting. Of the nine healthcare providers who attended the meeting, eight responded to the pre-test. The response rate to the pre-test was 88.88%. Six of the nine healthcare providers were willing to respond to the post-test. The response rate to the post-test was 66.67%. Due to the different number of response rates, comparison of pre- and post-test data is challenging. The percentages of increase shown in each question within the knowledge-based questions and the changes in the self-confidence evaluation survey may not be accurately represented.

A second limitation is that the presentation was offered in an only 30-minute time slot via Skype and not in person. The lack of in-person contact and use of distance technology could have impacted the differences in response rates on the pre- and post-tests. Utilization of Skype for the educational session was preferred by the facility in order to reach all of the nine clinics located throughout North Dakota. Another factor contributing to the response rate difference could have been that the pre- and post-tests were emailed out rather than completed in-person immediately before and after the educational session. A way this could have been combated is

the coinvestigator could have looked further into offering continuing education credits to the healthcare providers as an incentive to participate and complete the pre- and post-tests.

Another limitation is that the setting for project implementation was chosen by the coinvestigator. The setting was at a location where the coinvestigator had completed clinical rotations in the past. In addition, the coinvestigator developed a professional student-preceptor relationship with one of the healthcare providers, which may have influenced the participants' responses to the pre- and post-test. However, the informed consent did state that this study is anonymous. Furthermore, it clarified that no one, not even members of the dissertation team, will know what information came from each individual participant.

Implications for Advanced Practice Nursing

The opioid epidemic is a major concern despite the familiar impact and consequences opioids have brought to individuals, families, communities, and populations. In 2017, nearly 57 million patients in America had minimally one prescription of opioids written for them or refilled (CDC, 2019). Due to the distressing amount of addiction, overdose, and death related to the use of opioids, there has been an overabundance of evidence-based research articles and guidelines created and updated to address this concern. Most notably, the CDC Guideline for Prescribing Opioids for Chronic Pain is an exceptional resource for advanced practice nurses.

Advance practice nurses are held accountable to provide safe patient care and effectively manage their patients' chronic pain. Furthermore, advance practice nursing has advanced to the doctor of nursing practice (DNP). This forces the advanced practice nurse to be educated on delivering patient-centered care and has an emphasis on evidence-based practice (O'Grady, 2008). Through evidence-based practice and guidelines, advance practice nurses can maximize their knowledge regarding prevention and early recognition. Utilization of chronic pain

guidelines allows advanced practice nurses to intervene when pain issues arise in the clinical setting and educates them on being aware of non-pharmacological strategies in managing chronic pain (American Nurses Association, 2018).

The educational session and interactive discussion among the healthcare providers and with the coinvestigator allowed the participants to gain knowledge and confidence. In turn, it is anticipated that the educational session encouraged the participants to perform their own research and utilize evidence-based research and guidelines when prescribing opioids and managing chronic pain. With maximizing knowledge and confidence and knowing that health promotion and disease prevention have always been at the forefront of care delivered by advance practice nurses, there is hope for the future of our patients in relation to the opioid epidemic.

Dissemination

The closing step of the Iowa Model of Evidence-Based Practice is to disseminate the practice improvement project results (MeInyk & Fineout-Overholt, 2015). Disseminating the results among the healthcare system and encouraging the use of evidence-based research and guidelines is an important role in this process. Prior to completion of the results, the project was disseminated to the research committee at Sanford Health in Bismarck, ND and through a poster presentation at the North Dakota Nurse Practitioner Association Pharmacology Conference in September 2019. The results of the project will be disseminated in a three-minute thesis video, and a final poster will be made and presented at the Annual Research Day at North Dakota State University in spring of 2020.

Recommendations

Due to the well-known, significant opioid epidemic, there is a great probability that future DNP/FNP graduate students will create a practice improvement project on prescribing

opioids and chronic pain management. For future projects, recommendations include offering more than one educational session and inviting the entire healthcare team rather than simply the healthcare providers, increasing the length of the educational session to 60 minutes, receiving approval for one hour of continued medical education, and presenting the education in person rather than via Skype. In addition to future practice improvement project recommendations, there are suggestions to be made regarding practice and for the project site. These recommendations include continuing education (CE) hours on the topic of opioids and chronic pain management and education on tapering opioids.

Future Practice Improvement Projects

If time allotted, offering more than one educational session would be recommended, as this may increase the number of participants and respondents to the pre- and post-tests. By doing this, it represents flexibility and allows the adult learners to choose what best fits their schedule. In addition, in order to increase the number of participants, the project could be geared towards the entire healthcare team. This may include nurses, technicians, pharmacists, and support staff. Increasing the healthcare teams' knowledge and awareness on this topic would be beneficial for not only the healthcare team, but for patients as well.

Depending on where future graduate students would implement a similar project, allowing 60 minutes for presentation of the education would be ideal. Sixty minutes allows the coinvestigator to not feel rushed throughout their presentation and is enough time to disseminate the most recent up-to-date, evidence-based research and guidelines. Furthermore, this would leave the possibility for the coinvestigator to further investigate the possibility to receive approval for one hour of continuing medical education by the American Academy of Nurse Practitioners.

Lastly, holding the educational session in-person to the healthcare providers and/or healthcare team is recommended. This would likely increase the number of participants and respondents to the pre- and post-test. In person, rather than Skype, offers a more personable experience. Delivering the educational session on Skype eliminates eye contact and the opportunity for relationship building, and lag time may contribute to miscommunication or misunderstanding of pertinent information. Kemp and Grieve (2014) compared classroom to online learning and found that learning in a face-to-face environment offered more engagement, and participants appreciated the immediate feedback. While online learning allows for more flexibility,

Practice and Project Site

A recommendation for practice and the healthcare providers at Northland Health Centers is to require all healthcare providers who prescribe opioids for chronic pain management to have a set number of continuing education hours on managing chronic pain with opioids each year. By requiring continuing education hours on this topic, the healthcare providers would be provided with education to strengthen their knowledge and competence. Increased continuing education hours will help build healthcare leaders on this well-known topic and ultimately help to improve the care delivered to patients who are prescribed opioids and suffering from chronic pain. There are many benefits to continuing education including staying up-to-date on the most recent evidence-based practices, providing competent care, limiting legal risks, increasing pay, earning a promotion, and professional satisfaction (Nurse Journal, 2020).

Another implication is to maximize the healthcare provider's education on tapering opioids. Although there was an increase from the pre- to the post-test on question six, which focused on tapering opioids, this topic was identified by the participants as an area where they

felt least confident. The participants discussed the difficulty they experience in tapering their patient's opioids. A suggested recommendation includes a detailed education on ways to safely manage patients who need their opioids tapered and how to create an individualized plan to tailor to their patients' needs.

Conclusion

The practice improvement project's purpose was to utilize evidence-based research and the CDC Guideline for Prescribing Opioids for Chronic pain to improve healthcare providers' knowledge and confidence when prescribing opioids for chronic pain and managing chronic pain in a family practice clinic. The presentation of an educational session, discussion of current policies and pain agreements, and dialogue regarding future implementation of a policy regarding chronic pain management proved to be an effective intervention in improving the knowledge and confidence among participating healthcare providers. As an outcome of this practice improvement project, participating healthcare providers may be more likely to utilize evidence-based research and guidelines when prescribing opioids for chronic pain and managing chronic pain. By supporting and encouraging the use of evidence-based research and guidelines, patients are less likely to experience the harmful and unfortunate events that can occur from inappropriate prescribing of opioids and chronic pain management.

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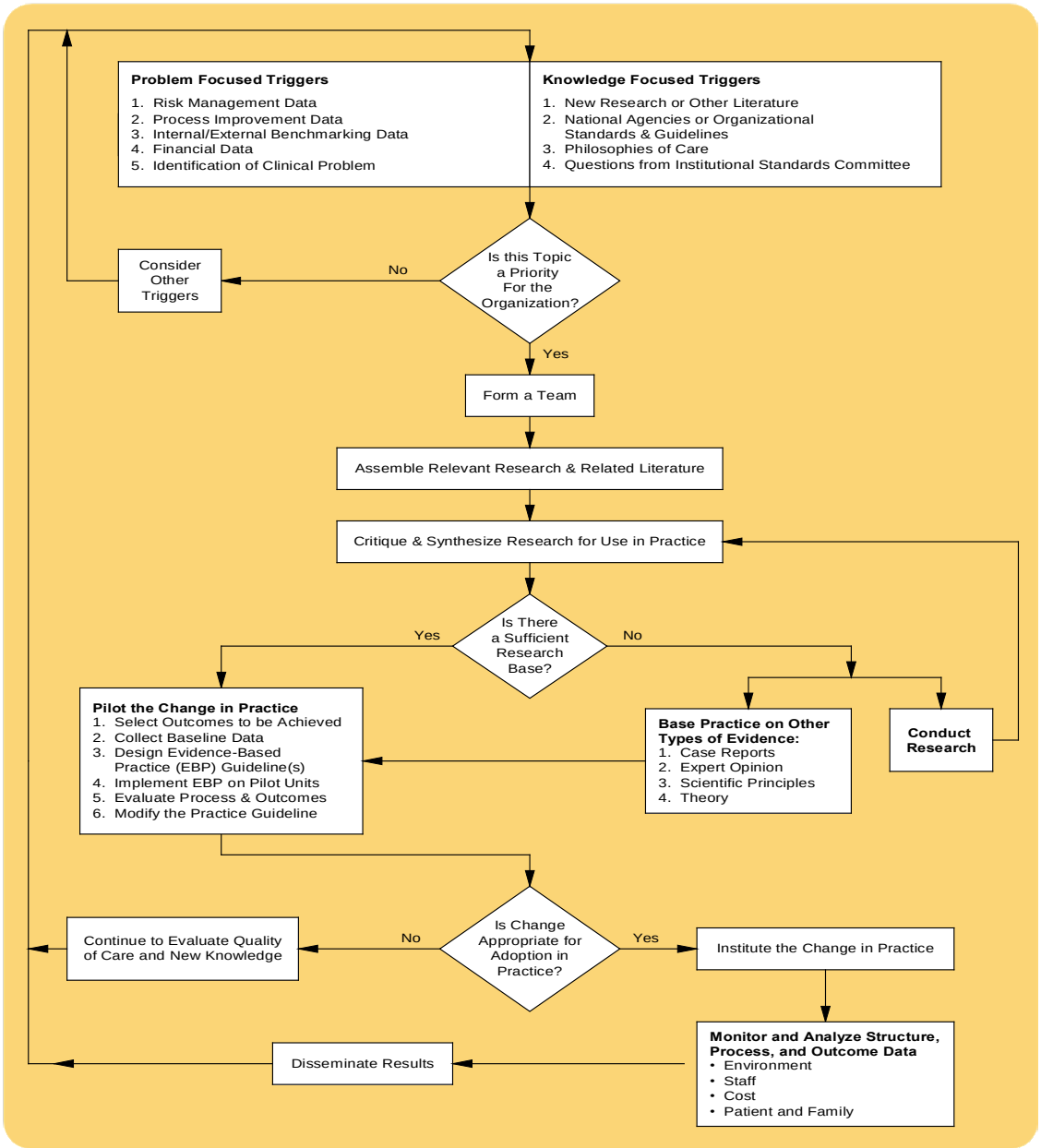
APPENDIX A. IOWA MODEL

The Iowa Model of Evidence-Based Practice to Promote Quality Care



◇ = a decision point

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REQUESTS TO:
Department of Nursing
University of Iowa Hospitals and Clinics
Iowa City, IA 52242-1009

APPENDIX B. PERMISSION TO USE THE IOWA MODEL

Kimberly Jordan - University of Iowa Hospitals and Clinics <noreply@qualtrics-survey.com>
Sun 1/19/2020 10:36 AM

You have permission, as requested today, to review and/or reproduce *The Iowa Model of Evidence-Based Practice to Promote Quality Care (Revised 1998).* Click the link below to open.

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APPENDIX C. EDUCATIONAL POWERPOINT

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STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY

Opioids: Implementation of Opioid Prescribing Education and Policy in a Primary Care Center

Jaclin Seeberg, DNP-Student, RN, BSN

Chair: Allison Peltier, DNP, FNP-C[1]

Committee Members: Mykell Barnacle, DNP, FNP-C[1]; Kara Falk, DNP, FNP-C[1]

Graduate Appointee: Dr. Daniel Friesner, PhD[2]

Affiliations: North Dakota State University School of Nursing[1]

North Dakota State University School of Pharmacy[2]

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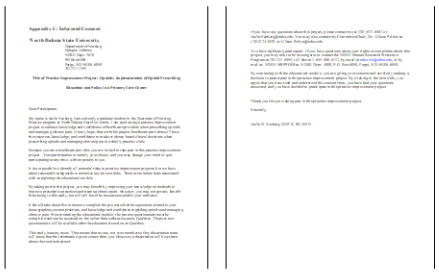
Informed Consent



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Details

- This educational session will take a half hour to complete.
- Prior to starting this educational session, there was a pre-test that was asked to be completed. Following completion, there is a post-test to be completed.
- This educational session is intended for any healthcare provider who prescribes opioids or cares for patients who suffer from chronic pain.
- This educational session focuses on methods of improving prescriptive practices for chronic pain management.

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Disclosure

- This educational session is part of a Doctor of Nursing Practice Clinical Dissertation Project.
- Grant funding was not received to assist in the development of this educational session.

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Learning Objectives

- Enhance knowledge and confidence when prescribing opioids and managing chronic pain.
- State the significance of the opioid epidemic.
- Identify ways to manage chronic pain with non-pharmacological and non-opioid practices.
- Recognize Chronic Pain Management Guidelines that can be incorporated into your practice.
- Identify interventions to improve opioid prescriptive practices.

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Why is management of chronic pain important?

- Pain is the most common reason a person pursues outpatient medical assistance.
- 100 million people are living with chronic pain.
- 35 million people in America have used a painkiller in a non-medical manner during their lifetime.
- *Teaching point: Know (where to find) your guidelines and be educated on your clinic's policies related to managing chronic pain and prescribing opioids*

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Opioids

- U.S. is only 4.6% of the world's population; however, roughly 80% of the opioids produced are consumed in the U.S.
- 130 Americans die every day from overdosing on an opioid
- According to the CDC in 2017, there were a total of 70,237 deaths related to drug overdoses
  - 68% of those deaths were related to overdose of opioids

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Non-Pharmacological and Non-Opioid Practices

- Non-pharmacological therapies
  - Complementary alternative medicine, weight loss, cryotherapy, heat or cold, PT, exercise therapy, acupuncture, yoga, CBT, meditation, sleep hygiene, support groups
- Guidelines recommend using acetaminophen or NSAIDs alone or in combination as a first line therapy for most pain conditions.
- Other non-opioid medications used: Antidepressants, anticonvulsants, and muscle relaxants
- ***Ensure the benefits outweigh the risks prior to prescribing opioid therapy!***

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Opioids for Chronic Pain

- *CDC guideline suggests healthcare providers prescribe short-acting opioids when initiating opioids for chronic pain rather than long-acting or extended-release opioids*
- CDC guideline states healthcare providers should prescribe the lowest effective dose of opioids.
  - Restrict to 50 mg morphine milligram equivalents (MME) per day when being started on opioid therapy.

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MME

Commonly Prescribed Opioids				
Medication	Dose Equal to 50 MME	Number of Dosages	Dose Equal to 90 MME	Number of Dosages
Hydrocodone	50 mg of hydrocodone	10 tablets of hydrocodone/acetaminophen (5/325mg) 5 tablets of hydrocodone/acetaminophen (10/325mg)	90 mg of hydrocodone	9 tablets of hydrocodone/acetaminophen (10/325 mg)
Oxycodone	33 mg of oxycodone	~2 tablets of sustained-release 15 mg 6 tables of oxycodone/acetaminophen (5/325 mg) 3 tablets of oxycodone/acetaminophen (10/325 mg)	60 mg of oxycodone	~2 tablets of sustained-release 30 mg 12 tablets of oxycodone/acetaminophen (5/325 mg) 6 tablets of oxycodone/acetaminophen (10/325mg)
Methadone	12 mg of methadone	Less than 3 tablets of methadone 5mg	~20 mg of methadone	4 tablets of methadone 5 mg

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Conversion Factors

Calculating MME	
Commonly Prescribed Opioids	Conversion Factor
Hydrocodone	1
Oxycodone	1.5
Methadone 1-20 mg/day 21-40 mg/day 41-60 mg/day Greater than or equal to 61-80 mg day	 4 8 10 12
Morphine	1
Hydromorphone	4
Codeine	0.15

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Case Studies

Case Studies/Examples to determine MME for a patient's daily intake	
Your patient is prescribed oxycodone/acetaminophen 5/325 mg, 1-2 tablets every 6 hours PRN for moderate to severe pain. · Calculation: (Total number of tablets per day) x (dose of medication) x (MME conversion factor) · Max number of times a patient could take in 24 hours: 24/6=4, 4 times/day · Max number of tablets a patient could take in 24 hours: 4 times a day x2 tablets= 8 tablets/day · Dose of medication: 5 mg of oxycodone · MME conversion factor of oxycodone: 1.5 · (8) x (5) x (1.5) = 60 MME per day, if patient is taking their maximum dose of medication prescribed ·	Your patient is prescribed hydrocodone/acetaminophen 5/325 mg 1-2 tablets every 4-6 hours PRN for moderate pain. · Calculation: (Total number of tablets per day) x (dose of medication) x (MME conversion factor) · Max number of times a patient could take in 24 hours: 24/4=6, 6 times/day · Max number of tablets a patient could take in 24 hours: 6 times a day x2 tablets= 12 tablets/day · Dose of medication: 5 mg of hydrocodone · MME conversion factor for hydrocodone: 1 · (12) x (5) x (1) = 60 MME per day, if patient is taking their maximum dose of medication prescribed

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Case Studies (cont.)

Case Studies/Examples to determine a patient's total daily dose that would be equivalent to 50 MME/day	
You, as the healthcare provider, are prescribing your patient oxycodone/acetaminophen 5/325 mg and you want to prescribe a dose that is equivalent to 50 MME/day. · Calculation: (desired MME per day) / (MME conversion factor) · Desired MME per day: 50 MME/day · Conversion factor for oxycodone: 1.5 · 50/1.5= ~33 · ~33 mg of oxycodone/day is equal to 50 MME/day · 33 mg of oxycodone/5 mg of oxycodone = ~ 6 tablets/day	You, as the healthcare provider, are prescribing your patient hydrocodone/acetaminophen 5/325 mg and you want to prescribe a dose that is equivalent to 50 MME/day. · Calculation: (desired MME per day) / (MME conversion factor) · Desired MME per day: 50 MME/day · Conversion factor for hydrocodone: 1 · 50/1= 50 · 50 mg of hydrocodone/day is equal to 50 MME/day · 50 mg of hydrocodone/5 mg of oxycodone = 10 tablets/day

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Chronic Pain Management Guidelines

- Centers for Disease Control and Prevention Guideline for Prescribing Opioids for Chronic Pain
- American Pain Society (APS)
- The American Academy of Pain Medicine (AAPM)
- Agency Medical Directors' Group (AMDG)

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Safe Prescriptive Practices

- **Assessment Tools**
  - Opioid Risk Tool (ORT)
    - https://www.mdcalc.com/opioid-risk-tool-ort-narcotic-abuse
  - Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R)
    - https://www.vcuhealth.org/media/file/Telehealth/SOAPP-R.pdf

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Safe Prescriptive Practices

- **Pain Agreement**
  - It is a document between the patient and healthcare provider.
  - Document may include a tool to aid in determining whether or not the opioid has been effective for the patient
    - PEG Assessment Scale
  - *CDC recommends reviewing the risks and benefits of opioid therapy for pain management at least every three months throughout therapy*
  - ***This is a time to educate your patient!***

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Safe Prescriptive Practices

- **Urine Drug Screening**
  - Obtains objective evidence in regard to the patient being treated with opioids
  - Helps to detect use of prescribed opioids
  - *Will not detect the amount of opioids taken*

- When should a **urine drug screen** be performed?
  - *Completed prior to initiating opioid therapy*
  - Frequency to be completed based on patient's risk level
    - Low risk: biannually – annually
    - Standard risk: quarterly
    - High risk: frequently & randomly

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Safe Prescriptive Practices

- **Prescription drug monitoring programs (PDMP)**
  - "Detects patterns of drug abuse, and prevents doctor shopping or prescription duplication"
  - Check the patient's PDMP profile prior to prescribing any opioid
  - *CDC also recommends the PDMP to be checked every three months and periodically for patients who are being managed with opioids for chronic pain*
  - In North Dakota, providers can use a delegate, such as a registered nurse, to check the PDMP.

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Safe Prescriptive Practices

- **Pills Counts**
  - Fulfilled by having the patient bring in their prescribed opioids
  - Especially helpful when concerned about diverting or binging patterns
  - Perform randomly and with short notice
  - Use a witness when performing

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Safe Prescriptive Practices

- **Past Medical History**
  - Risk factors for opioid dependence include patients who have a medical history of substance abuse, including illicit drug use or alcohol dependence, and/or a mental health disorder
    - If a patient admits to substance abuse, may want to consider a referral to a pain specialist
    - Patients who are suffering from mental health disorders should have their mental health disorder treatment regimen maximized prior to initiating an opioid for pain management

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Safe Prescriptive Practices

- **Naloxone**
  - Opioid antagonist
  - Suggested to prescribe to patients who have an increased risk of overdosing
    - >50 morphine equivalents/day
    - Also taking benzodiazepines
    - History of overdosing and/or substance abuse
- **Tapering Opioids**
  - *Opioids should be decreased by 5% to 10% every week to 28 days*
  - Patients who suffer from anxiety or dependence, tapering opioids at a slower pace of three to six months is recommended
  - Be aware of withdrawal clinical manifestations

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Safe Prescriptive Practices

- **Referring Care**
  - Primary healthcare provider will often refer their patient if they do not respond to the initial treatment.
  - Patients are often suffering from moderate to severe pain.

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Resources

- CDC
  - https://www.cdc.gov/drugoverdose/pdf/Guidelines_Factsheet-a.pdf
- APS
  - https://www.jpain.org/article/S1526-5900(08)00831-6/fulltext
- APS in conjunction with AAMP
  - http://americanpainsociety.org/uploads/education/guidelines/chronic-opioid-therapy-cncp.pdf
- AMDG
  - http://www.agencymeddirectors.wa.gov/Files/2015AMDGOpioidGuideline.pdf

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Resources (cont.)

- Conversion Calculator for Opioids
  - https://www.mdcalc.com/morphine-milligram-equivalents-mme-calculator
- Cellphone APPs
  - CDC Opioid Guideline
  - MDCalc
    - Opioid Risk Tool (ORT)
    - Calculate MME

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VoiceThread Link

- Please visit this presentation at voicethread.com for your reference.
- Link: https://voicethread.com/myvoice/thread/12849865/77615623/71992901

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Questions?

- Thank you all for listening to my presentation for my practice improvement project.
- Contact information: Jaclin Seeberg, DNP-Student, RN, BSN
- Jaclin.Seeberg@ndus.edu

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APPENDIX D. MORPHINE MILLIGRAM EQUIVALENT

Commonly Prescribed Opioids				
Medication	**Dose Equal to 50 MME**	**Number of Dosages**	**Dose Equal to 90 MME**	**Number of Dosages**
Hydrocodone	50 mg of hydrocodone	10 tablets of hydrocodone/acetaminophen (5/325mg) OR 5 tablets of hydrocodone/acetaminophen (10/325mg)	90 mg of hydrocodone	9 tablets of hydrocodone/acetaminophen (10/325 mg)
Oxycodone	33 mg of oxycodone	~2 tablets of sustained-release 15 mg 6 tables of oxycodone/acetaminophen (5/325 mg) 3 tablets of oxycodone/acetaminophen (5/325 mg)	60 mg of oxycodone	~2 tablets of sustained-release 30 mg 12 tablets of oxycodone/acetaminophen (5/325 mg) 6 tablets of oxycodone/acetaminophen (10/325mg)
Methadone	12 mg of methadone	Less than 3 tablets of methadone 5mg	~20 mg of methadone	4 tablets of methadone 5 mg

Calculating MME	
Commonly Prescribed Opioids	**Conversion Factor**
Hydrocodone	1
Oxycodone	1.5
Methadone 1-20 mg/day 21-40 mg/day 41-60 mg/day Greater than or equal to 61-80 mg day	 4 8 10 12
Morphine	1
Hydromorphone	4
Codeine	0.15

(CDC, n.d.)

APPENDIX E. MORPHINE MILLIGRAM EQUIVALENT CASE STUDIES

Case Studies to determine MME for a patient's daily intake	
Your patient is prescribed oxycodone/acetaminophen 5/325 mg, 1-2 tablets every 6 hours PRN for moderate to severe pain. • Calculation: (Total number of tablets per day) x (dose of medication) x (MME conversion factor) • Max number of times a patient could take in 24 hours: 24/6=4, 4 times/day • Max number of tablets a patient could take in 24 hours: 4 times a day x2 tablets= 8 tablets/day • Dose of medication: 5 mg of oxycodone • MME conversion factor of oxycodone: 1.5 • (8) x (5) x (1.5) = 60 MME per day, if patient is taking their maximum dose of medication prescribed	Your patient is prescribed hydrocodone/acetaminophen 5/325 mg, 1-2 tablets every 4-6 hours PRN for moderate pain. • Calculation: (Total number of tablets per day) x (dose of medication) x (MME conversion factor) • Max number of times a patient could take in 24 hours: 24/4=6, 6 times/day • Max number of tablets a patient could take in 24 hours: 6 times a day x2 tablets= 12 tablets/day • Dose of medication: 5 mg of hydrocodone • MME conversion factor for hydrocodone: 1 • (12) x (5) x (1) = 60 MME per day, if patient is taking their maximum dose of medication prescribed
Case Studies to determine a patient's total daily dose that would be equivalent to 50 MME/day	
You, as the healthcare provider, are prescribing your patient oxycodone/acetaminophen 5/325 mg and you want to prescribe a dose that is equivalent to 50 MME/day. • Calculation: (desired MME per day) / (MME conversion factor) • Desired MME per day: 50 MME/day • Conversion factor for oxycodone: 1.5 • 50/1.5= ~33 • ~33 mg of oxycodone/day is equal to 50 MME/day • 33 mg of oxycodone/5 mg of oxycodone = ~ 6 tablets/day	You, as the healthcare provider, are prescribing your patient hydrocodone/acetaminophen 5/325 mg and you want to prescribe a dose that is equivalent to 50 MME/day. • Calculation: (desired MME per day) / (MME conversion factor) • Desired MME per day: 50 MME/day • Conversion factor for hydrocodone: 1 • 50/1= 50 • 50 mg of hydrocodone/day is equal to 50 MME/day • 50 mg of hydrocodone/5 mg of hydrocodone = 10 tablets/day

APPENDIX F. PRE- & POST-TEST QUESTIONS

Please answer the following questions to the best of your ability without using resources.

1. Which of the following patients has the greatest risk of experiencing chronic pain?
    a. A male who has a low annual income.
    b. A male who has a high annual income.
    c. **A female who has a low annual income.**
    d. A female who has a high annual income.

2. According to the CDC Guideline for Prescribing Opioids for Chronic Pain, when should the Prescription Drug Monitoring Program (PDMP) be reviewed?
    a. When initiating opioid therapy for chronic pain management, sporadically, and ranging from each prescription to every 6 months
    b. **When initiating opioid therapy for chronic pain management, sporadically, and ranging from each prescription to every 3 months**
    c. When initiating opioid therapy, each prescription and annually
    d. When initiating opioid therapy, each prescription and every 6 months

3. According to the CDC Guideline for Prescribing Opioids for Chronic Pain, which of the following is *false*:
    a. **Healthcare providers should prescribe long-acting opioids when initiating opioids for chronic pain rather than short-acting.**
    b. Patients should be restricted to 50 mg morphine equivalents per day when started on opioid therapy.
    c. Opioids are not first-line for managing chronic pain.
    d. Long term use of opioids often begins when patients are being treated for their acute pain.

4. According to the CDC Guideline for Prescribing Opioids for Chronic Pain, the healthcare provider should review the risks and benefits of opioid therapy for pain management:
    a. Every 6 months throughout therapy
    b. Annually
    c. On an as needed basis
    d. **Every 3 months throughout therapy**

5. Which of the following are true regarding urine drug screening and opioids? (Select all that apply.)
    a. Urine drug screens will detect the amount of opioids taken by the patient.
    b. **Urine drug screens can help to detect use of prescribed opioids, or if a patient is not using the opioids prescribed to them, which may indicate diversion of opioids.**
    c. **Urine drug screening should be initiated prior to opioid therapy.**
    d. Healthcare providers continue to over utilize urine drug screening when managing patients' chronic pain

6. When tapering opioids a patient's daily dose of opioids should be:
    a. Decreased by 75% every week to 28 days
    b. Decreased by 50% every week to 28 days
    c. Decreased by 25-30% every week to 28 days
    d. **Decreased by 5 to 10% every week to 28 days**

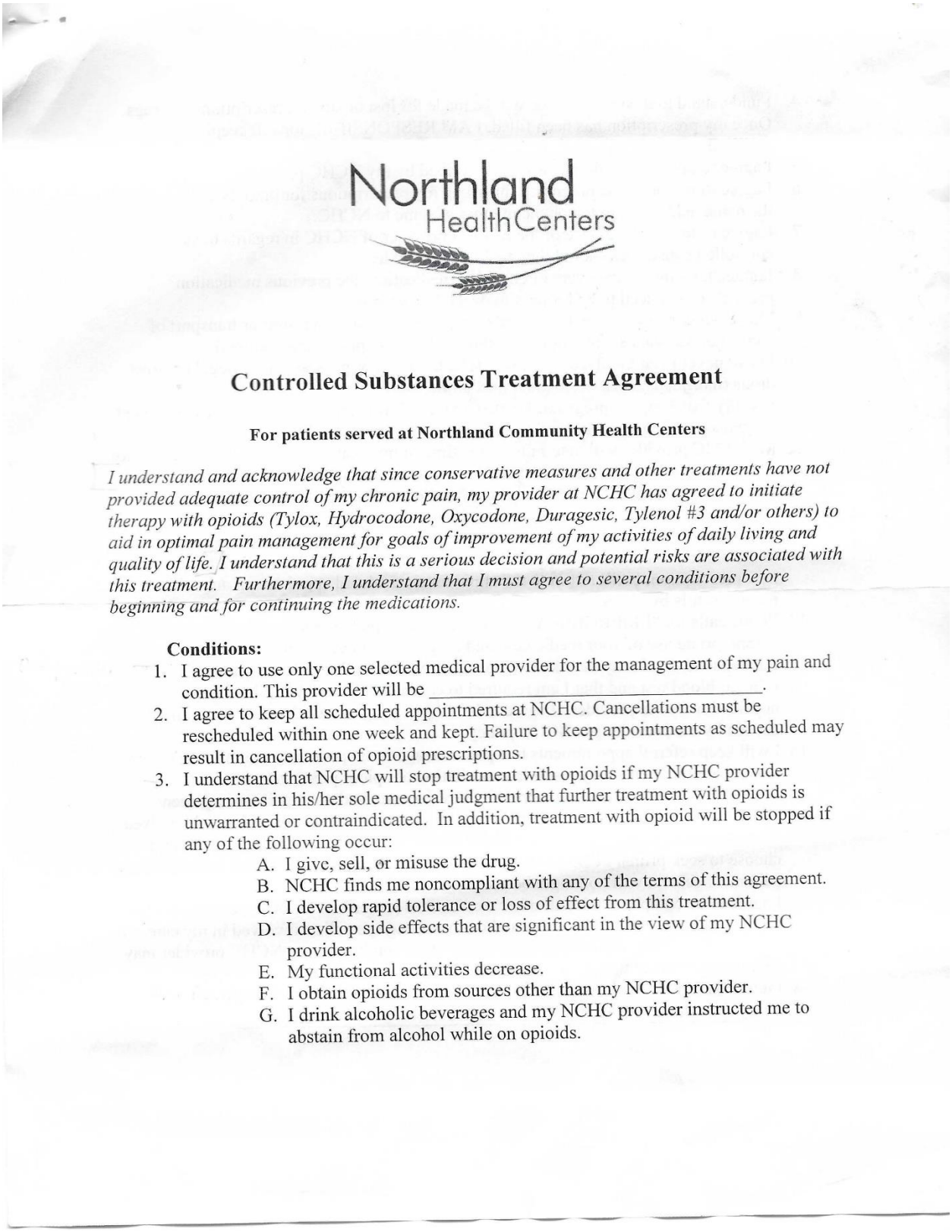
APPENDIX G. LIKERT SURVEY

Please circle the numeric response that best fits to what extent you agree or disagree with each statement. (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly Agree

Statement	Strongly Agree	Somewhat Agree	Neither agree not disagree	Somewhat Disagree	Strongly Disagree
1. I am confident in my ability to prescribe opioids for chronic pain.	5	4	3	2	1
2. I am confident in my ability to assess, diagnose, and manage patients' chronic pain.	5	4	3	2	1
3. I am confident in knowing the potential adverse effects that are associated with opioid use.	5	4	3	2	1
4. I am confident in knowing the potential harms associated with opioid use.	5	4	3	2	1
5. I am confident in my ability to utilize the PDMP.	5	4	3	2	1
6. I am confident in my ability to accurately read a urine drug screen.	5	4	3	2	1
7. I am confident in my ability to initiate and maintain an opioid therapy agreement.	5	4	3	2	1
8. I am confident in my ability to obtain a thorough medical history including questions pertaining to a patient's drug and alcohol use.	5	4	3	2	1
9. I am confident in my ability to taper opioids when necessary.	5	4	3	2	1

Statement	Strongly Agree	Somewhat Agree	Neither agree not disagree	Somewhat Disagree	Strongly Disagree
10. I am confident in my ability to determine when it is appropriate to refer my patients to pain management specialists	5	4	3	2	1

APPENDIX H. CONTROLLED SUBSTANCES TREATMENT AGREEMENT



Northland Health Centers

Controlled Substances Treatment Agreement

For patients served at Northland Community Health Centers

I understand and acknowledge that since conservative measures and other treatments have not provided adequate control of my chronic pain, my provider at NCHC has agreed to initiate therapy with opioids (Tylox, Hydrocodone, Oxycodone, Duragesic, Tylenol #3 and/or others) to aid in optimal pain management for goals of improvement of my activities of daily living and quality of life. I understand that this is a serious decision and potential risks are associated with this treatment. Furthermore, I understand that I must agree to several conditions before beginning and for continuing the medications.

Conditions:

1. I agree to use only one selected medical provider for the management of my pain and condition. This provider will be _____.
2. I agree to keep all scheduled appointments at NCHC. Cancellations must be rescheduled within one week and kept. Failure to keep appointments as scheduled may result in cancellation of opioid prescriptions.
3. I understand that NCHC will stop treatment with opioids if my NCHC provider determines in his/her sole medical judgment that further treatment with opioids is unwarranted or contraindicated. In addition, treatment with opioid will be stopped if any of the following occur:
    A. I give, sell, or misuse the drug.
    B. NCHC finds me noncompliant with any of the terms of this agreement.
    C. I develop rapid tolerance or loss of effect from this treatment.
    D. I develop side effects that are significant in the view of my NCHC provider.
    E. My functional activities decrease.
    F. I obtain opioids from sources other than my NCHC provider.
    G. I drink alcoholic beverages and my NCHC provider instructed me to abstain from alcohol while on opioids.

4. I understand that NO allowance will be made for lost or stolen prescriptions or drugs. Once my prescription has been filled, I AM RESPONSIBLE for safekeeping of my medication.
5. I agree to take the medicine only as prescribed by my NCHC provider.
6. I agree to use only one pharmacy for filling my prescriptions for opioids and to supply the name, address, and telephone number of same to NCHC.
7. I agree to follow the advice of the medical provider of NCHC in regards to stopping controlled substances should they feel it is advisable.
8. I understand that in the event of changing medication, the previous medication prescribed will need to be brought to NCHC for disposal.
9. I have never been involved in the sale, illegal possession, diversion or transport of controlled substances (narcotics, sleeping pills, nerve pills or pain killers).
10. I have never been involved in the use, sale, transport or possession of illegal or street drugs (marijuana, cocaine, methamphetamine, etc.).
11. I certify that I am not pregnant. I certify that I will use appropriate measures to prevent pregnancy during the course of my treatment with opioids.
12. My NCHC provider will determine at the time of my visit if refills are appropriate prior to a follow up visit, unless the medication prescribed is a scheduled II medication and refills are not allowed. Scheduled II medications will need to be prescribed monthly and it will be my NCHC provider discretion how often I need to be seen for a new prescription. If I am not provided refills (schedule III-V medications), I agree to return to the clinic for a scheduled appointment. If I am provided refills and am in need of a new prescription, I will return to the clinic for a scheduled appointment and will not request refills by phone.
13. Phone calls for "EMERGENCY" refills are not acceptable. Such calls suggest inappropriate use of your medication and may result in termination of this agreement.
14. I understand that I may be asked, at the discretion of my NCHC medical provider, for a urine or blood test and that I am required to complete this within 72 hours of notification by the provider. I agree to be subject to an annual drug screen at any time chosen by me provider per NCHC policy.
15. I will keep referral appointments to a pain management specialist. Failure to keep any referral appointments may result in cancellation of opioid prescriptions.
16. I understand that NCHC is a community health center and not a pain management clinic. I agree that my NCHC provider will be my primary care provider and involved in management of my preventative health and/or chronic conditions. If at any time I choose to seek primary care at a different facility, this agreement will be terminated and pain management will no longer be provided.
17. I agree to be compliant with all other medications prescribed for management of other conditions by my NCHC provider and/or consulting specialists involved in my care. If I am noncompliant with management of my other conditions, my NCHC provider may choose to terminate this agreement.
18. I understand that NCHC and/or my provider have the right to terminate this agreement at any time, for any reason.

I agree to allow my NCHC medical provider to communicate with my other providers/physician and any pharmacists regarding my use of opioids and other controlled substances. I hereby authorize any pharmacy, medical provider, or institution to release to NCHC information concerning my use of opioids or other controlled substances. A copy of this agreement may be relied upon by such individuals / entities as authorization to release such information to NCHC.

Failure to comply with any of the terms of this agreement will cause cancellation of all opioid medications.

Risks and Complications

I acknowledge that my provider has discussed with me the possible risks and complications associated with opioids. Some of the risks associated with opioids include but are not limited to the following:

Constipation, decreased appetite, confusion or other changes in mental state of thinking, problems with coordination or balance which may make it unsafe to operate dangerous equipment or motor vehicles, increased sleepiness or drowsiness, breathing too slowly, physical dependence (which means that abrupt stopping of the drug may lead to withdrawal syndrome), psychological dependence (which means that I may need more and more to get the same effect). Children born to mother on controlled substances are usually physically dependent on the drug at birth.

I am aware that further discussion of risks, side effects, complications and contraindications of opioids will be included in information provided by the pharmacy filling my prescriptions and any package inserts provided by the manufacturer/distributor to the specific drug(s) prescribed for me. I agree to carefully review any such information provided by the pharmacy or manufacturer/distributor. I understand that if I have specific questions after reviewing such information, I should consults with my medical provider.

PATIENT AFFIRMATION:

I have read this consent and agreement, understand it, and have had all my questions answered satisfactorily. I have had sufficient opportunity to discuss my condition and treatment with my NCHC medical provider and believe I have adequate knowledge upon which to base an informed consent to the proposed treatment. I understand that I may voluntarily terminate my treatment at any time. I hereby consent to the use of opioids in the manner outlined above.

Name / Signature
Date

Witness

Primary Medical Provider

Pharmacy name, address, and phone number

APPENDIX I. QUESTIONNAIRE

Demographics and Current Practices

1. In what area of practice are you formally trained and licensed/registered?
    a. Nurse Practitioner
    b. Physician Assistant
    c. Physician
    d. Other

2. How many years have you been practicing as a healthcare provider?
    a. Less than 5 years
    b. 5-10 years
    c. 11-20 years
    d. More than 20 years

3. Over the last 12 months, for approximately how many patients have you prescribed an opioid to manage their chronic pain?
    a. 0
    b. 1-2 patients
    c. 3-4 patients
    d. 5 or more patients

4. If you have prescribed a patient(s) an opioid for managing their chronic pain, was a pain contract or pain agreement initiated?
    a. Yes
    b. No

5. If you answered "yes" to the previous question, what percentage of your patients who are taking opioids for chronic pain have a pain agreement in place?
    a. 25% or less
    b. 26-50%
    c. 51-75%
    d. More than 75%
    e. I have not prescribed an opioid for managing chronic pain.

6. What are barriers you have come across to using evidence-based guidelines when prescribing opioids in a family practice clinic? (Select all that apply.)
    a. There are no barriers I follow evidence-based guidelines when prescribing opioids.
    b. Lack of time
    c. Evidence-based guidelines are not easy to follow
    d. There is limited access to evidence-based guidelines in the clinic
    e. Other, please explain
    _____

7. If you have prescribed a patient(s) an opioid for managing their chronic pain, did you use an evidence-based practice guideline to aid in prescribing the opioid?
    a. Yes, please indicate the guideline used:
    _____
    b. No
    c. I have not prescribed an opioid for managing chronic pain.

8. While earning your graduate degree, did you learn how to manage chronic pain?
    a. Yes
    b. No

APPENDIX J. COURSE PARTICIPATION

Dear Healthcare Provider,

My name is Jaclin Seeberg. I am currently a student at North Dakota State University in the Doctorate of Nursing Practice program. I am working on my clinical dissertation and would like to invite you to partake in an educational session focusing on opioid prescribing and managing chronic pain. The course is entitled "Opioids: Implementation of Opioid Prescribing Education and Policy in a Primary Care Center." This 30-minute educational session provides information and resources regarding methods of improving prescriptive practices including chronic pain management guidelines and safe prescriptive practices, and treating chronic pain with non-pharmacological, non-opioid practices, and opioids. There is no charge for participation in this educational session.

The website for the pre- and post-test questionnaire is:
https://ndstate.co1.qualtrics.com/jfe/form/SV_9oVvAqlBubJOgQt

The password for entry into the pre- and post-tests is: NDSU

Simply click on this address to go directly to the questionnaire. If the link does not work, copy and paste the above URL into the address bar of your Internet browser.

Your participation in this project is strictly voluntary.

If you have any questions, please feel free to contact me at Jaclin.Seeberg@ndsu.edu.

Thank you for participating in this important practice improvement project.

Sincerely,

Jaclin Seeberg, DNP-S, BSN, RN
NDSU Nursing at Sanford Health
North Dakota State University, Bismarck, ND

APPENDIX K. IRB APPROVAL

NDSU NORTH DAKOTA STATE UNIVERSITY

August 13, 2019

Dr. Allison Peltier
Nursing

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #PH20026, "Opioids: Implementation of Opioid Prescribing Education and Policy in a Primary Care Center"

Co-investigator(s) and research team: Jaclin Seeberg, Mykell Barnacle, Kara Falk, Daniel Friesner
Date of Exempt Determination: 8/13/2019 Expiration Date: 8/12/2022
Study site(s): Northland Health Center
Sponsor: n/a

The above referenced human subjects research project has been determined exempt (category #2(ii)) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the revised protocol submission (received 8/5/2019) with updated consent (received 8/8/2019).

Please also note the following:
• If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
• The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
• Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
• Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.
Sincerely,

Kristy Shirley

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult http://www.ndsu.edu/research/integrity_compliance/irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

INSTITUTIONAL REVIEW BOARD
NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb
Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

APPENDIX L. INFORMED CONSENT

North Dakota State University

Department of Nursing
Campus Address
NDSU Dept. 2670
PO Box 6050
Fargo, ND 58108-6050
701.231.7395

Title of Practice Improvement Project: Opioids: Implementation of Opioid Prescribing Education and Policy in a Primary Care Center

Dear Participants:

My name is Jaclin Seeberg. I am currently a graduate student in the Doctorate of Nursing Practice program at North Dakota State University. I am conducting a practice improvement project to enhance knowledge and confidence of healthcare providers when prescribing opioids and managing chronic pain. It is my hope, that with this project, healthcare providers will have the resources, knowledge, and confidence to make evidence-based clinical decisions when prescribing opioids and managing chronic pain in a family practice clinic.

Because you are a healthcare provider, you are invited to take part in this practice improvement project. Your participation is entirely your choice, and you may change your mind or quit participating at any time, with no penalty to you.

It is not possible to identify all potential risks in practice improvement projects, but we have taken reasonable safeguards to minimize any known risks. There are minimal risks associated with completing the educational module.

By taking part in this project, you may benefit by improving your knowledge on methods to improve prescriptive practices and treating chronic pain. However, you may not get any benefit from being in this study, but will still have the resources available your reference.

It should take about five minutes to complete the pre-test which has questions related to your demographics, current practices, and knowledge and confidence regarding opioids and managing chronic pain. Prior to starting the educational module, the pre-test questionnaire must be completed and can be accessed on the online data software system, Qualtrics. The post-test questionnaire will be available after the educational session on Qualtrics.

This study is anonymous. That means that no one, not even members of my dissertation team, will know that the information given comes from you. However, a dissertation will be written about the results obtained.

If you have any questions about this project, please contact me at (701)527-6987 or Jaclin.Seeberg@ndsu.edu. You may also contact my Committee Chair, Dr. Allison Peltier, at (701)224-3820 or Allison.Peltier@ndsu.edu.

You have rights as a participant. If you have questions about your rights or complaints about this project, you may talk to the investigator or contact the NDSU Human Research Protection Program at 701.231.8995, toll-free at 1-855-800-6717, by email at ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept. 4000, P.O. Box 6050, Fargo, ND 58108-6050.

By continuing with the educational module, you are giving your consent and are freely making a decision to participate in this practice improvement project. By clicking to the next slide, you agree that you have read and understood the consent from, you have had your questions answered, and you have decided to participate in this practice improvement project.

Thank you for your taking part in this practice improvement project.

Sincerely,

Jaclin D. Seeberg, DNP-S, RN, BSN

APPENDIX M. POLICY CREATION RECOMMENDATIONS

1. Complete a thorough medical history and physical exam.
    a. Ask questions pertaining to a patient's drug and alcohol use.
    b. Obtain outside medical regards relating to previous pain management, if applicable.

2. Create realistic treatment goals and timelines for use of opioid therapy.
    a. Goals should include improvement in both pain control and quality of life. This can be measured by using an assessment scale, Pain average, interference with Enjoyment of life, and interference with General activity (PEG).

3. First line therapy treatment for chronic pain does not include opioid therapy.
    a. Ensure the benefits outweigh the risks prior to prescribing opioid therapy.
    b. If the healthcare provider does prescribe opioids to their patient, opioid therapy should be combined with non-pharmacological and non-opioid therapy.

4. Prior to initiation of opioid therapy, a healthcare provider must discuss opioid-related risk factors with each of their patients.
    a. Discuss the risks for potential adverse effects and potential harms.

5. Prescribe immediate release opioids prior to initiating daily, long acting opioids.

6. Calculate the MME.
    a. Patients should be restricted to 50 mg morphine equivalents (MME) per day when being started on opioid therapy.
    b. Prescribe the minimum amount and lowest dose of opioids, while remaining effective.

7. Utilize the use of the PDMP.
    a. Healthcare providers should check the patient's PDMP profile prior to prescribing any opioid.
    b. The PDMP to be checked every three months and periodically.

8. Avoid co-prescription of opioids with benzodiazepines, other sedating drugs, or additional opioids.

9. Obtain a urine drug screen.
    a. Prior to initiating opioid therapy, as needed, and annually.

10. Pain medication agreement.
    a. Sign and date agreement.

APPENDIX N. EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

IMPLEMENTATION OF OPIOID PRESCRIBING EDUCATION AND POLICY IN A PRIMARY CARE CENTER

PARTICIPANTS AND SETTING

The educational session was offered to 10 healthcare providers at their monthly meeting. The session took place via Skype in order to reach nine family practice clinics across North Dakota.

PROJECT FINDINGS

When comparing answers to the knowledge-based questions from the pre-test to the post-test, an overall increase in percentage of healthcare providers answering the questions correctly was identified.

Based on the overall results of the self-confidence survey, the Likert scale, there was an increase in percentage in the "strongly agree" section when comparing the pre- and post-tests.

INTRODUCTION

Pain is the most common reason a person pursues outpatient medical treatment. Today, approximately 100 million Americans are currently living with pain and 35 million people in America have used a painkiller in a non-medical manner during their lifetime.

Since the year of 1999, deaths from prescription opioids have escalated by more than five times. Healthcare providers play an essential role in reducing the opioid epidemic and improving the way opioids are prescribed. However, healthcare providers have communicated challenges in treating, assessing, and preventing chronic pain.

ISSUES FACED BY HEALTHCARE PROVIDERS

An educational gap in the clinical setting that needs to be addressed is the fact that healthcare providers do not feel confident when prescribing opioids, as many healthcare providers report insufficient training on the tools provided to them to ensure safe prescribing habits.

Prior to the educational session, knowledge deficits were identified among healthcare providers in regards to their ability to identify patients at risk for chronic pin, utilize the PDMP according to guideline recommendations, and taper opioids.

PROJECT DESIGN

The purpose of the project was to utilize evidence-based research and the CDC guidelines for Prescribing Opioids for Chronic Pain to improve healthcare providers' knowledge and confidence when prescribing opioids for chronic pain and managing chronic pain in a family practice clinic.

Implementation of the practice improvement project included an educationaal session and discussion in regards to the clinic's pain agreements and policies on the most recent evidence-based literaure and guidelines regarding prescribing opioids and mangagment of chronic pain. The practice improvement project was developed with the goal to achieve three objectives.

No definitive changes were made to their pain agreements, the provider supervisor was supportive of possibly implementing a policy regarding managing chronic pain in the clinic's future.

Contact Information

Jaclin Seeberg
NDSU Doctor of Nursing Practice
Graduate Student
Jaclin.Seeberg@ndus.edu

- The first objective was to enhance provider knowledge on opioid prescribing guidelines and evidence-based practices regarding opioids and managing chronic pain.
- The second objective was to increase the participants' confidence in their ability to manage chronic pain in a family practice clinic.
- The third objective was to review and update the clinic's policies and pain agreements related to pain and opioids to reflect the CDC guidelines.

RECOMMENDATIONS

Allow coinvestigator student to present the opioid and chronic pain management educational session for healthcare providers to enhance provider knowledge and confidence. If time allotted, offering more than one educational session, and allowing at minimum 60 minutes of face-to-face interaction for the educational session would be ideal. Furthermore, this would leave the possibility for the coinvestigator to further investigate the possibility to receive approval for one hours of continuing medical education by the American Academy of Nurse Practitioners.

Invite the coinvestigator to discuss and make recommended changes to align the most recent evidence-based literature and guidelines in regard to the clinic's pain agreement and policies.

Require all healthcare providers who prescribe opioids for chronic pain management to have a set number of continuing education hours on this topic to strengthen their knowledge and competence.

POTENTIAL BENEFITS

- Enhanced healthcare providers' knowledge.
- Enhanced healthcare providers' confidence.
- Re-enforced the importance of evidence-based practice and guidelines.
- Reduced negative outcomes experience by patients who are suffering from chronic pain and prescribed opioids.

CONCLUSION

The presentation of an educational session, discussion of current policies and pain agreements, and dialogue regarding future implementation of a policy regarding chronic pain management proved to be an effective intervention in improving the knowledge and confidence among participating healthcare providers.

Supporting and encouraging the use of evidence-based resarch and guidelines allows patients to be less likely to experience harmful and unfortunate events that can occur from inappropriate prescribing of opioids and chronic pain management.