

PENNSYLVANIA NURSE PRACTITIONERS' OPIOID PRESCRIBING
KNOWLEDGE, BELIEFS, AND PRACTICES

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Abstract

Prescription opioid abuse is on the rise. Pennsylvania nurse practitioners are in a position to propagate or improve this problem. The purpose of this study is to investigate the knowledge, beliefs, and prescribing practices of Pennsylvania nurse practitioners to understand the concerns associated with treating chronic pain with opioid medications. Members of the Pennsylvania Coalition of Nurse Practitioners were emailed an invitation to complete an anonymous online survey. The survey instrument, the Practices and Perceptions of Primary Care Physicians with Regard to Chronic Pain and Prescription Opioid Use Survey, developed by Keller, was modified with permission to apply to nurse practitioners. Thirty-four nurse practitioners completed the survey, although incomplete surveys were submitted by some of the participants. The majority of participants were female (69.7%) family nurse practitioners (82.4%) working in primary care (76.5%) who prescribe opioids for chronic non-malignant pain (81.8%). Participants indicated chronic pain as being prevalent yet controlled in less than 20% of their patients. These findings, coupled with reluctance to prescribe opioids due to concerns for physical dependence, discomfort with managing patients with opioid dependence, and a rating of education in this area as just adequate, suggest the need for additional education, resources, and support in this area. A topic for further investigation is whether the prescribing practice match the self-identified opioid knowledge, belief, and practices of nurse practitioners who prescribe opioid medications.

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Chapter 1

Introduction

Opioid abuse and over prescribing of opioids are a growing concern in the United States. Often, the focus of drug misuse is placed on illegal drugs, such as heroin, however the side effects of prescription opioids can be just as dangerous. The purpose of this descriptive, cross-sectional study is to identify Pennsylvania nurse practitioners' opioid prescribing knowledge, beliefs, and practices. This chapter will provide background information on prescription opioid abuse and the role of health care providers related to the problem. A statement of the problem, research question, and key terms will be defined. In addition, a brief overview of the conceptual framework guiding this study, assumptions, and limitations will be detailed.

Background of the Problem

Many nurse practitioners' and patients are unaware of the true risk of opioid abuse. Side effects of these medications can vary from drowsiness to death (U.S. Department of Justice Drug Enforcement Administration [DEA], 2011). The use of prescription opioids, such as oxycodone, hydrocodone, and codeine, leads to more deaths than heroin and cocaine combined (Cerd ai et al., 2013). Many of these prescriptions are considered schedule II class substances through the DEA. This means that these drugs are tracked closely, have accepted medical benefits, and "have a high risk for both physical severe psychological or physical dependence" (DEA, 2011, p. 9). Despite these substances being controlled and monitored, a combination of an opioid known as hydrocodone and acetaminophen was, "the most frequently prescribed medication in 2010 with 131.2 million prescriptions given out" (IMS for Healthcare Informatics, 2011,

p. 33). In 2011, over half (55%) of the 41,340 drug overdose deaths in the United States were related to pharmaceuticals (Centers for Disease Control and Prevention [CDC], 2011). Among these pharmaceutical deaths in 2011, almost three-fourths of them (74%) were due to opiates (CDC, 2011). These numbers are trending upwards at an alarming rate; overdose death rates have been climbing since 1992, with a 118% increase from 1999 to 2011 (CDC, 2011).

In 2011, approximately 1.4 million visits to emergency departments involved the nonmedical use of pharmaceuticals; 420,040 of these visits were related to opioid analgesics (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). Many more visits, due to combination drugs such as Vicodin, may be unaccounted for. These combination drugs put patients at additional risk through the effects of the drug with which these drugs are combined. Acetaminophen, a common additive, may cause severe liver damage (DEA, 2011, p. 41). Moreover, in a survey conducted from 2009 to 2010, of the 79% survey respondents who used pain relievers for non-medical indications, only 2.3% obtained drugs from a friend, relative, or drug dealer (SAMHSA, 2010). The implication is that the pain relievers were prescribed.

Clinicians are faced with the dilemma of effectively treating patients' pain at the risk of misuse or abuse by the recipients. Katzman et al. (2014) further note that, "[p]rimary care clinicians . . . often lack the knowledge and confidence of best practices in pain and addiction treatment" (p. 1356). Researchers have studied clinicians' knowledge and perceptions about opioid prescribing but have either limited their focus to physicians (e.g., Keller et al., 2012) or only included nurse practitioners as one segment of the total sample (e.g., Hooten & Bruce, 2011; Jamison, Sheehan, Scanlan, Mathews, &

Ross, 2014; Katzman et al., 2014). The purpose of the present study is to focus on nurse practitioners as prescribers of opioids. Icek Ajzen's Theory of Planned Behavior serves as the foundation for this study, as nurse practitioners' intentions and actions as opioid prescribers are linked to their knowledge and beliefs. This theory will be discussed further in chapter two.

Statement of the Problem

Prescription opioids are becoming increasingly abused and can have lethal consequences. Nurse practitioners who are prescribing these medications need to be aware of the potential adverse effects on their patients. Understanding nurse practitioners' opioid prescribing knowledge, beliefs, and practices could identify areas for improvement through educational or other strategies.

Research Questions

1. What knowledge do Pennsylvania nurse practitioners have about prescribing opioids?
2. What are the beliefs of Pennsylvania nurse practitioners about prescribing opioids?
3. What are the opioid prescribing practices of Pennsylvania nurse practitioners?

Definition of Terms

The following is a list of the definitions of the concepts included in the research question:

1. Beliefs--"subjectively held information . . . that links a behavior of interest to positive or negative outcomes, to the normative expectations of important referent

individuals or groups, and to control factors that can facilitate or inhibit performance of the behavior” (Ajzen et al., 2011, p. 115).

2. Knowledge--As defined by Ajzen et al. (2011): “the extent to which the information people have is accurate” (p. 102).
3. Nurse Practitioner – “is a licensed, advanced practice registered nurse (APRN) who has completed a prescribed educational program that includes advanced knowledge, skills, and abilities in assessment, diagnosis, treatment, and management. CNPs provide care to individuals, families, and groups in accordance with their educational preparation and national certification, both independently and in collaboration with other healthcare professionals” (National Organization of Nurse Practitioner Faculties, 2013, para. 1)
4. Opioid– “The term ‘opioid’ encompasses the *opiates* (natural alkaloids and semisynthetic opioids derived from the resin of the opium poppy) and the *nonopiate opioids* (wholly synthetic agents originally developed to provide opiate-like analgesic effect without some of the side effects.)” (Ward, 2014, p. 1548).
5. Opioid Prescribing Practices--actual behaviors in a clinical setting that include the number and type of opioids prescribed as well as indications for prescribing opioids.
6. Prescription Drug Abuse – “Prescription drug abuse is the use of a medication without a prescription, in a way other than as prescribed, or for the experience or feelings elicited (National Institute on Drug Abuse, 2011, para. 1).

Need for the Study

In the past few decades research has shown that the amount of opioid prescriptions has increased significantly and has coincided with dependence and recreational use. It is important to explore the knowledge, beliefs, and practices of those who prescribe these medications. Beliefs are important as the evidence suggests that attitudes about opioids are “better predictors of prescribing practices than any sociodemographic or contextual variables” (Wilson et al., 2013). The current body of research is primarily focused on physicians’ practices and attitudes. With the ever-growing population of nurse practitioners it is important to explore their role in prescribing these medications that can have severe and fatal consequences if misused.

A review of the U.S. literature between the years 2010 and 2016 was completed in CINAHL Full Text, using the search terms “nurse practitioner” AND “opioid prescribing” AND “attitudes.” Search results yielded 54 peer-reviewed sources, with 22 of the 54 eliminated on the basis of being irrelevant or studies conducted outside of the U.S. or listed as conference abstracts or bibliographies. Of the 22 remaining peer-reviewed research articles, none were specific to nurse practitioner practice. An expanded search using the MEDLINE, Academic Search Premier, and Health Source: Nursing/Academic databases yielded similar results. The current study fills this research gap.

Significance of the Problem

This study is designed to explore the current opioid prescribing knowledge, beliefs, and practices of nurse practitioners in Pennsylvania. Opioid medications may be over-prescribed and fueling the nonmedical use of these medications. Providers need to

be aware of the significant consequences over-prescribing these medications can have on not only their patients, but their patients' family members and friends. These consequences can range from impaired driving ability to death. Exploration of current beliefs and practices of those who prescribe and treat with these medications may reveal areas for improving pain management while minimizing adverse outcomes.

Assumptions

The following assumptions are made in this study:

1. Participants are practicing nurse practitioners in the Commonwealth of Pennsylvania.
2. Participants have current experience prescribing opioids.
3. Participants can read and understand English.
4. Participants will answer questions honestly.

Summary of the Problem

With the increasing demand for pain management, opioid prescriptions have been climbing at a significant rate. This has coincided with an increasing use of these medications for both medical and nonmedical uses. As mentioned earlier, over 420,000 emergency department visits in 2011 were due to nonmedical use of these medications (SAMHSA, 2011). While these medications have their place in managing pain and have helped countless patients, it is important for those who provide these medications to take the risks of these medications into their decision-making. It is important to identify the knowledge, beliefs, and practices of nurse practitioners who are often in a position to prescribe these medications. This study is needed to build on the very limited amount of currently available research that is exclusively focused on the nurse practitioner role.

Chapter 2

Review of Related Literature

In order to write prescriptions for controlled substances, health care providers must register with the Drug Enforcement Agency (DEA). In December 2015, there were 53,363 “practitioners” (physicians, dentists, and veterinarians) and 12,972 “mid-level practitioners” (nurse practitioners, physician assistants, and optometrists) in Pennsylvania with active DEA registrations (Office of Diversion Control, 2015). Despite representing nearly a quarter of authorized prescribers of opioids in Pennsylvania alone, few studies have been conducted with mid-level practitioners, in general, or nurse practitioners, specifically, as the major focus. The purpose of the present study is to fill this gap in the research.

This chapter will provide an overview of prescription opioid abuse as well as review the limited number of studies that have addressed health care providers’ knowledge or beliefs about prescription opioids. In addition, Ajzen’s Theory of Planned Behavior, the theoretical framework for this study, will be described.

Prescription Opioid Abuse

Opioids are derived from the poppy plant and have been around for thousands of years. The plant was used for the feeling it could provide its users. It became more popular in medicine during the early 1800s, when morphine was first extracted from the poppy plant (Rosenblum, Marsch, Joseph, & Portenoy, 2008). Since then, a variety of these types of medications and administration methods have been developed. While opioids are known for their potent ability to manage pain, they have also been shown to be addictive and dangerous due to their sedative effects. The National Institute on Drug

Abuse (2014) notes that opioids are often misused for their euphoric effects and can be more addictive when crushed and used for non-medical purposes

Trends over the last two decades are conclusive that there has been a large increase in both prescribing and abusing opioid medications. According to the CDC (2014), the amount of retail pharmacy opioid prescriptions has increased by 288% from 1991 to 2011. In Pennsylvania, from 2013 to 2014, overdoses from opioids increased by 12.9%, with prescription opioids one of the major sources (CDC, 2016). There are a variety of reasons for these deaths: many are abusing these medications to manage pain, some enjoy the feeling these medications provide, while others mix them with other substances increasing their sedative effects (National Institute on Drug Abuse, 2014).

Current research shows that patients often purposefully misuse these medications. One study in Wisconsin found that, of 801 patients who received narcotics from 235 physicians, 26% intentionally used the medication for over sedation, 39% increased their dosage without a recommendation to do so, 18% were using the pain medication for means other than pain, and 12% were hoarding the pain medications (Von Korff, Kolodny, Deyo, & Chou, 2011). Current trends indicate an increase in the number of opioid prescriptions in parallel to an increase in opioid abuse (Turk, Dansie, Wilson, Moskovitz, & Kim, 2014).

Healthcare Providers' Prescription Opioid Knowledge and Beliefs

A number of studies have been conducted on the underlying knowledge and beliefs that lead providers to prescribe or not prescribe opioid medications. The target population for these studies has included pediatric nurses, certified nurse anesthetists,

pharmacists, physician assistants, nurse practitioners, and physicians. The major focus, however, has been physicians so these studies will be reviewed first.

Physicians as opioid prescribers. Recognizing the benefit of prescribing opioids to relieve noncancer related pain amidst regulatory concerns, Wolfert, Gilson, Dahl, and Cleary (2010) conducted a survey of Wisconsin physicians' opioid knowledge, beliefs, attitudes, and prescribing practices. For their study, the researchers mailed a 32-question survey, invitation to participate, and \$2 incentive to 600 physicians randomly selected from a state medical licensing database. Non-responders received reminder mailings, and, for one-third of the non-responders, a telephone call. Two hundred and sixteen surveys were completed. The majority of the respondents (87%) were currently in full- or part-time practice; 57% were currently treating patients with cancer or non-cancer pain. Twenty-five percent also indicated having no formal training in pain management.

Survey questions were in two domains. The first domain was knowledge of laws and clinical guidelines. When asked about knowledge of prescribing laws at the state and federal level, so few respondents answered these questions that the researchers were unable to run a statistical analysis. Of those who gave responses, 40% answered "don't know" for each question or indicated incorrect responses. Knowledge of pain management clinical practice guidelines was also low, at 38%. In response to concerns over being investigated for their opioid prescribing practices, 59% reported no concerns, yet also indicated self-regulating their prescribing practices, such as limiting the number of refills or prescribing from a lower schedule, to avoid possible investigation by the authorities (Wolfert et al., 2010).

The second domain in the survey assessed attitudes. Four scenarios were presented to identify attitudes toward prescribing opioids long term for cancer or chronic noncancer pain. In response to a scenario involving long term opioid treatment of noncancer pain, 35% responded that this was lawful but not medically acceptable; 4% actually considered it to be against the law. If the patient had a history of substance abuse, 56% indicated this was lawful but medically unacceptable to treat noncancer pain; 22% indicated the same if it was for cancer pain. Physicians who did not prescribe Schedule II opioids were more likely to identify opioid treatment of chronic noncancer pain as either illegal or not medically acceptable (Wolfert et al, 2010).

On final analysis, the researchers conclude “it is concerning that so few responding physicians have the knowledge and training to effectively treat patients experiencing chronic pain” (p. 432). They recommend efforts to increase awareness of clinical and regulatory guidelines (Wolfert et al., 2010).

Similar to the Wolfert et al. (2010) study, Keller et al. (2012) targeted physicians’ practices and attitudes regarding the dilemma of managing chronic pain with opioids while avoiding opioid dependence. Participants were recruited from a multi-specialty primary care physician group in Upstate New York. Of the 125 physicians in the group, 81 were selected at random and mailed the researcher-designed survey instrument. The 17-item survey consisted of multipart questions related to physician and practice characteristics (e.g., age, gender, medical specialty, years of practice); individual opioid prescribing practices; self-assessment of level of knowledge related to treatment of pain, state and federal guidelines for treating pain, and opioid dependence; beliefs related to chronic pain and opioid use; and adequacy of prior training in the treatment of chronic

pain or opioid dependence. A one-dollar incentive was enclosed with the survey and non-responders were sent a second survey as a reminder. A total of 35 physicians completed the survey, giving a response rate of 43%.

The majority of respondents (91.4%) affirmed that they prescribe opioids for chronic nonmalignant pain. All of the physicians indicated that less than 14% of their patients were on long term opioids for their chronic pain. Survey results further revealed that 22.9% of the physicians thought that most patients obtained their first opioids from sources other than prescriptions for the patient. Only 20% of the participants thought they had a good education in addressing chronic pain. In addition, respondents rated their level of concern for tolerance, dependence, and addiction at 4.15 out of five, indicating a significant concern for opioid abuse (Keller et al., 2012).

One of the limitations of this study is the authors do not mention how or if they tested the validity or reliability of their survey. The study is also limited by the small sample size and failure to include opioid prescribers other than physicians. Despite these shortcomings it is clear that this study demonstrates beliefs that may be barriers to prescribing opiates for adequate pain management and perceived knowledge deficits related to chronic pain or opioid use.

Wilson et al. (2013) conducted a large scale study exploring attitudes and beliefs about opioids among primary prescribers that included 1,535 participants. Again, physicians were their population of interest. One purpose of their study was to develop and test a reliable and valid research instrument to assess clinicians' attitudes about opioids. To this end, the researchers developed the Clinicians attitudes about Opioids Scale (CAOS), which in its original form consisted of 67 items with an internal

consistency established through a Cronbach's alpha score of 0.81 and a test-re-test correlation of $r = .78$.

In testing the instrument, the same sample of 1,535 physicians participated in the second and third phases of the instrument's development. The majority of participants were male (82.9%), between the ages of 45 and 60 (53%), and in practice for more than 10 years (75.3%). Specialties with the highest percentage of respondents were internal medicine (37.3%), psychiatry (12.9%), anesthesiology (12.8%), and surgery (10.3%), which may reflect the researchers' use of a recruitment company that maintains a large database of members who agree to participate in surveys. Thirty-nine percent of participants indicated 11%-30% of patients seen each week involved chronic non-cancer pain; 47.9% indicated that <20% of their chronic non-cancer patients received opioids, with 53% prescribing Schedule II opioids to <20% of these same patients. Practice patterns depended on the volume of patients with chronic non-cancer pain seen each week, with physicians seeing larger numbers being less likely to have concerns over prescribing Schedule II versus III opioids (Wilson et al., 2013).

In general, however, results of the CAOS identified physicians' greatest impediments regarding opioid use for chronic non-cancer pain to be risk of physical dependence ($m = 7.35$), tolerance ($m = 7.27$), and addiction ($m = 7.49$). This survey also included the practitioners' perception of the adequacy of their education on opioids. On a one to ten scale, prescribers strongly disagreed ($m = 3.88$) that their education and training for treatment of chronic non-cancer pain while in medical school was adequate and only somewhat agreed it was adequate ($m = 4.77$) while in residency. These results are consistent with those of Wolfert et al. (2010) and Keller et al. (2013). On further

analysis, physicians between 45 and 60 indicated more deficits in their education and training than did those younger than age 45 (Wilson et al., 2013).

Wilson et al. (2013) also compared medical specialties for differences in opioid concerns (dependence, side effects, and patient compliance) and beliefs about the efficacy of opioids. For treatment of chronic non-cancer pain, orthopedists indicated the greatest degree of opioid concerns ($m = 7.34$) and lowest level of confidence in opioid efficacy ($m = 4.64$), which may reflect the acute nature of most conditions that they treat. As might be expected, for treatment of chronic non-cancer pain, pain management specialists had the lowest degree of opioid concerns ($m = 5.89$) and highest level of confidence in their efficacy ($m = 6.07$). In addition, confidence in opioid efficacy was greater in males than females, physicians older than age 45, and physicians who saw a greater number of patients with chronic pain.

In its final form Wilson et al. (2013) reduced the CAOS to a valid and reliable survey instrument consisting of 38 items assessing the subscales of Impediments and Concerns, Perceived Effectiveness, Medical Education, Schedule II vs III Opioids, and Tamper Resistant Formulations and Dosing. Among their recommendations is evaluation of the instrument with other providers, such as nurse practitioners

Opioid prescribers in general. As the concept of primary care provider has expanded, so has the recognition that providers other than physicians have a role in managing patients with chronic pain, which includes prescribing opioids. Nurse practitioners in all but one state, Florida, have the authority to prescribe controlled substances (DEA, 2015a). The few studies on prescription opioid knowledge, beliefs,

and practices that have expanded their target population to include advanced practice nurses and other providers will be discussed here.

Hooten and Bruce (2011) conducted a survey to assess beliefs and attitudes of healthcare providers about the use of prescription opioids for chronic pain. The researcher-developed instrument consisted of 2 multipart questions in response to 10 clinical scenarios. Questions were designed to assess the likelihood of prescribing a long-acting opioid, beliefs about the likelihood of specific outcomes as a result of prescribing a long-acting opioid (e.g., leads to abusive behavior, improves patient quality of life), and ratings of how “bad” they would feel (attitude) if the outcome occurred.

Participants were recruited from attendees at a three-day medical continuing education conference on pain management. The study was only available to those who had the ability to prescribe opioid medications. Of the 128 study participants, 83% were physicians and 17% were in the combined category of physician assistant/advanced practice nurse. Fifty-eight percent of participants indicated they were slightly, somewhat, or extremely likely to prescribe opioids for chronic pain. In response to the scenarios, results of the two multipart questions were pooled and reported as frequencies. Participants were most likely to believe that prescribing long acting opioids for nonmalignant pain would be effective in controlling pain and improving the patient’s quality of life. At the same time, participants believed that doing so was likely to lead to abusive behavior and addiction. Ratings were also high for the belief that prescribing long acting opioids for nonmalignant pain would add to the complexity of the overall evaluation and management of the patient. Participants’ attitude ratings paralleled their belief ratings. The majority of participants indicated they would feel slightly, somewhat,

or extremely good if the opioid was able to control pain and improve quality of life. In addition, they would feel “bad” if the opioids led to abuse or addiction. They also admitted to a negative attitude over the effect opioid prescribing has on concerns and factors associated with the complexity of the patient’s care (Hooten & Bruce, 2011).

Overall, participants’ responses in the Hooten and Bruce (2011) study were more alike than different, which may reflect their common purpose at the conference, which was to learn more about pain management. There are several other weaknesses in this study. For one, the responses to each clinical scenario were only presented as pooled data, leaving open the possibility of dissimilar responses between questions leading to skewed overall results. Second, the categories of “attitudes” and “beliefs” have such similar responses, despite the use of different scales, that their conceptual differences are questionable. Most importantly, the researchers note that the original tool was intended for an audience of physicians but administered to a mixed group of providers with no differentiation in the responses by provider type. This latter oversight reinforces the need to explore nurse practitioners’ opioid prescribing knowledge, beliefs, and practices.

Jamison et al. (2014) also conducted a study to evaluate providers’ perceptions in relation to the use of opioids in the management of chronic pain. The study took place as part of a larger study involving eight primary care centers located in Boston. Participants were recruited through staff meetings held at the centers. Study participants were given a \$200 incentive to complete and return by mail the packet of questionnaires, which included a 19-item Background and Prescribing Practices Questionnaire, 12-item General Health Questionnaire, 10-item Opioid Therapy Survey, 22-item Concerns about Analgesic Prescriptions, and 25-item Test of Opioid Knowledge.

The Background and Prescribing Practices Questionnaire included demographics as well as evaluating working conditions, stress, work satisfaction and perception about managing patients with chronic pain on a ten-point scale. Fifty-six providers agreed to participate in the study. Of these, 80.4% were physicians, 14.3% were nurse practitioners, and 5.45% were physician assistants. All of the non-physicians answered that they had not received any special training to deal with pain. Research also showed the non-physician providers scored higher in feeling insufficiently trained in prescription opioids. This may correlate with the perceptions based off these tools that showed that the nurse practitioners and physician assistants scored 2.3 points higher than their physician counterparts when being asked about being emotionally drained from their work (Jamison et al., 2014).

The primary care provider's (PCP) Test of Opioid Knowledge scores had an average score of 68.8% which researchers deemed as, "only adequate" (Jamison et al., 2014, p.378). According to the researchers, older providers scored significantly higher than younger providers. The most frequently missed questions involved providers over-estimating the amount of babies born with opioid withdrawal symptoms (>60% vs 50%), opioid treatment goals of improved physical function when the correct answer was pain relief, and when to refer to a specialist, providers frequently chose both current and past drug problems when the correct answer was current drug problems only (Jamison et al., 2014).

The General Health Questionnaire (GHQ) evaluated emotional well-being including cognition, sleep, depression, anxiety and somatic symptoms. Researchers determined that the GHQ was not found to be related to prescription attitudes.

Concerns about Analgesic Prescriptions and Opioid Therapy Survey results were discussed together. The results show that PCPs find treating patients with chronic pain stressful. The survey showed that 89% of providers were concerned about misuse, while 84% of PCP's answered that dealing with chronic pain patients are stressful (Jamison et al., 2014, p. 379). Over half of the study participants felt that they were inadequately trained in prescribing opioids (Jamison et al., 2014).

All of these tools combined show that the majority of providers in this study express concerns for managing chronic pain with opioid medications. The primary concerns were for medication abuse and addiction. Concerns for inadequate training were higher among nurse practitioners than their physician counterparts showing that there needs to be more evaluation of the knowledge and underlying beliefs of current nurse practitioners as they increase their role in managing pain (Jamison et al, 2014).

Theoretical Framework

The theoretical framework for this study is Icek Ajzen's Theory of Planned Behavior (TPB). According to TPB, personal beliefs impact one's behavior and likelihood of acting in a certain manner. Ajzen (1991) notes that "perceived behavioral control, together with behavioral intention, can be used directly to predict behavioral achievement" (p. 184). The concept of intentions is assumed to "capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen, 1991, p. 181). The theory identifies three determinants of intention: attitudes toward the behavior, subjective norms or social influences, and the perceived behavioral control (Ajzen, 1991, p.188).

An individual's self-control is an important predictor of behavior and is described in more length than the other factors of intention which are barely mentioned in the TPB. Ajzen (1991) describes self-control as an individual's level of difficulty performing a task or level of resistance (p. 183). Ajzen explains that an individual's perceived self-control is more predictive than their actual level of self-control. If individuals have a high level of self-control and intent, then they should be able to perform the intended task. Ajzen also suggests the stronger the intent, the more likely individuals are to perform that behavior.

The Theory of Planned Behavior has been used by a number of researchers, especially for studies which predict behavior. McDermott et al. (2015) utilized TPB as the framework for their systematic review on food selection. Researchers stated that they utilized this theory because "understanding the underpinnings of these behaviors will provide invaluable assistance in the development of behavior change interventions" (McDermott et al., 2015, p. 2). They found in their review that the association between intention and behavior was $r = 0.45$, while attitudes had the strongest association with intention (McDermott, 2015). This indicates a strong relationship between a decision maker's attitudes and intentions with their future behavior. Armitage and Conner (2001) conducted a meta-analysis of the Theory of Planned Behavior and concluded their findings "provide[s] evidence supporting the use of the TPB for predicting intention and behavior" (p. 485).

By exploring a provider's perceived outcomes, the social influence on prescribing opioid medications, and difficulty or consequences of prescribing these medications, this theory suggests an ability to predict behaviors. By understanding the decision making

process of providers who prescribed opioid medications, it may be possible to acknowledge deficits in the decision making process, thus improving patient outcomes and minimizing adverse effects.

Summary of the Review of Related Literature

The overall theme of these studies is that the majority of prescribers realize that there is a risk to patients who receive opioid medications long term. Some research shows that non-physician providers such as nurse practitioners have a higher level of being emotionally drained from their work and find themselves inadequately trained when it comes to dealing with patient's pain with prescribing opioid medications. The CDC (2014) estimates that, in Pennsylvania, 82 to 95 prescriptions are written per 100 people. This places Pennsylvania at a higher rate than most states. Due to the risks of these medications the Pennsylvania Medical Society (2014) has released their recommendations stating that opioids should rarely be used as a sole treatment and that recurrent abusers should be discontinued from chronic opioid therapy.

Chapter 3

Methodology

This study evaluates current Pennsylvania nurse practitioners' opioid knowledge, beliefs, and prescribing practices. In this chapter the research design, setting, sample, ethical considerations, research instrument, and plans for data collection and analysis will be discussed.

Research Design

A non-experimental, cross-sectional design was used for this study. Descriptive data was collected at one time, measuring perceptions as they were at the time of the study.

Setting

Study participants completed the survey in any setting accessible to an internet connection. The presumption was that access would take place in Pennsylvania or would be completed outside of Pennsylvania by certified registered nurse practitioners who currently work in Pennsylvania.

Sample

The sample consisted of certified registered nurse practitioners in Pennsylvania who were members of the Pennsylvania Coalition of Nurse Practitioners (PCNP). Participants were recruited through electronic submission of an invitation to participate. Due to the relatively short time available to complete the study, a goal was set for 30 completed surveys.

Ethical Considerations

The researcher completed CITI training involving human subjects and student research, and, as such, complied with the standards of that training. Permission to conduct the study was obtained from Clarion University of Pennsylvania's Institutional Review Board (IRB, Appendix A) as well as from the PCNP, for permission to utilize their database (Appendix B).

The invitation to participate (Appendix C) served the dual purpose of describing the study's aim to characterize Pennsylvania nurse practitioners' opioid prescribing knowledge, beliefs, and practices, as well as assuring adherence to ethical considerations. The letter provided the researcher's contact information as well as assured participants that completion of the survey was voluntary and that they had the right to not answer all of the questions. Participants were also assured that no identifying information would be collected, that there was no known risk to completing the survey, and the benefit was to increase our understanding of factors related to opioids prescribing. No monetary or other incentives were given to participate. Participants who agreed with these terms implied their consent by completing the survey.

Copies of the electronically completed survey were saved in a digital format on a dedicated thumb drive housed in a locked file cabinet and will be destroyed after 3 years. No data was locally saved on the website. Furthermore, SurveyMonkey (2013) states that all of their survey information is private and neither the results nor email addresses of participants are sold. They also state the survey results are protected by, passwords, firewalls, data encryption safely transmit data (SurveyMonkey 2013).

Instrumentation

The instrument for this study was a modification of the Practices and Perceptions of Primary Care Physicians with regard to Chronic Pain and Prescription Opioid Use Survey (Appendix D) developed by Keller et al. (2012) for use in their study of primary care physicians' opioid knowledge, beliefs, and practices, as described in chapter 2.

Permission to modify the instrument has been granted by the primary author (Appendix E). The original survey instrument consists of 16 questions (incorrectly numbered on their survey as 17) that were modified to identify the provider as the nurse practitioner. Specifically, references to the practice of medicine were changed to advanced practice nursing. Specialty areas were those of nurse practitioners, rather than physicians.

Although Keller et al. did not categorize the questions, to facilitate analysis of the data, the questions will be organized as follows:

Demographics. Questions in this category include question #1, which consists of 7 parts and four parts of question #3. The first question elicits information about the provider, such as age, gender, years of practice. Modifications from the original survey included substitution of physician-specific medical specialties and practice sites to those specific to nurse practitioners. Nurse practitioner specialties were based on certification options by the various boards; practice sites were derived from survey options reported in the 2012 National Sample Survey of Nurse Practitioners report (Health Resources and Services Administration, 2012). Parts a, b, d, and e of question #3 allow the provider to quantify the number of patients they treat who have chronic pain, are prescribed opioids, meet treatment goals, and develop evidence of withdrawal, tolerance, physical dependence, and/or addiction to opioids.

Knowledge. Knowledge of treatment and management of chronic pain, regulatory guidelines for treatment of chronic pain, and screening, treatment, and management standards related to opioid dependence is self-rated in question #4, using a 5-point Likert scale, with 1 = very poor to 5 = excellent. Related questions in this category are # 8, which characterizes the provider's training and education in the management of chronic pain; #9, which characterizes the providers training and education in the management of opioid dependence; and #12, which serves to elicit willingness for additional training and support. For the latter question, the Likert scale was modified from the original to provide specific choices of 1 = won't, 2 = probably won't, 3 = possibly will, 4 = probably will, 5 = definitely will,

Beliefs. Beliefs, including what Keller et al. (2012) refer to as level of concern and comfort with managing patients with opioid dependence or addiction, are addressed in question #6, in which the provider indicates the percentage of patients in their practice as well as the U.S. that they believe suffer from chronic pain, and #7, in which the same ratings are made in relation to the percentage of patients physically dependent on prescribed opioids. Concerns related to prescribing opioids are addressed in part c of question #3, question #10, and question #13. For clarity, the Likert scale used in part e of question #3 was modified from a range of options (1 = not at all concerned to 5 = very concerned) to specific choices (1 = not at all concerned, 2 = slightly concerned, 3 = moderately concerned, 4 = definitely concerned, 5 = very concerned). Question #13 asks the provider to identify what they believe to be the major problem with regard to the use of opioids in the management of chronic pain.

Practices. Questions # 2, 5, and 11 characterize the provider's practices related to management of chronic pain. Question #2 establishes whether or not the provider prescribes opioid analgesics as well as how often and what specific drugs. Question #5 asks the provider to rank order the methods they use to monitor a patient's response to opioid treatment. Question #11 asks the provider to characterize their management strategies related to the patient who they believe may be drug-seeking or are opioid dependent.

Three questions from the original survey, #5, #14, and #17 will be omitted from the present study. Question #5 asks the provider to rate the effectiveness of allowing an opioid-addicted patient to take part in the planning of the treatment of his or her addiction to opioids. This question involved both beliefs as well as practices and is not relevant to the research question. Question #14 asks the provider if a patient's opioid dependence, or addiction affects the management of other medical conditions. This is also not relevant to the research questions. The final question, #17, asks the provider to identify patients' characteristics at the provider's practice site. The focus of this study is characteristics of the providers.

The survey design lends itself to a descriptive analysis to characterize Pennsylvania nurse practitioners' opioid prescribing knowledge, beliefs, and practices in the same manner Keller et al. (2012) characterized primary care physicians in upstate New York.

Data Collection

After obtaining IRB consent, an electronic invitation to complete the survey was sent to members of the PCNP. The invitation included all elements required for informed

consent and a link to the survey. The survey tool was administered through SurveyMonkey with a goal response of 30 survey participants. The sole researcher was the only one with access to these results.

Summary of Methodology

This non-experimental survey study evaluates current beliefs, knowledge, and prescribing practices of current licensed nurse practitioners in Pennsylvania. The study is a modification of a study by Keller et al. on primary care physicians' opioid knowledge, beliefs, and practices. For the current study, the language in the research instrument developed by Keller et al. was modified to reflect the role of the nurse practitioner. The results will be described and analyzed in Chapter 4. Evaluating the results is valuable because understanding underlying beliefs and intentions according to Theory of Planned Behavior has been shown to predict future behaviors.

Chapter 4

Results and Discussion

Thirty-four nurse practitioners participated in the survey from 07/08/2016 to 07/26/2016. Of the 34 nurse practitioners who participated in the survey, 31 (91%) answered all the survey questions. Due to the anonymous nature of this study, it is unknown why any participants chose to skip or to not finish the survey.

Characteristics of Participants

The majority of participants were female (69.7%), certified as family nurse practitioners (82.4%), working in primary care (76.5%) at a private physician’s office or clinic (81.8%), and prescribe opioids for chronic non-malignant pain (81.8%). Almost all (94.1%) of the nurse practitioners were between the ages of 25 and 64.

Table 1

Nurse Practitioner Characteristics

NP Characteristic	Mean or n (%)		n (%)
Age	44.3	Practice setting	
Gender (n = 33)		Private office/practice	19 (55.9%)
Female	23 (69.7%)	Clinic	8 (23.5%)
Male	10 (30.3%)	Emergency department	3 (8.8%)
Race (n = 34)		Urgent care clinic	1 (2.9%)
Caucasian	34 (100%)	Retail-based health	1 (2.9%)
Years of practice	8.4	Community health	1 (2.9%)
Educational specialty		Employee health	1 (2.9%)
Family NP	28 (82.4%)	Practice Specialty	
Adult Nurse NP	4 (11.8%)	Primary Care	26 (76.5%)
Acute Care NP	2 (5.9%)	Oncology	2 (5.9%)
Adult-Gerontology Primary	1 (2.9%)	Emergency	2 (5.9%)
Women's Health NP	1 (2.9%)	Internal Medicine	1 (2.9%)
Hospice	1 (2.9%)	Orthopedics	1 (2.9%)
Oncology	1 (2.9%)	Hospice	1 (2.9%)
		Pain Clinic	1 (2.9%)

Nurse Practitioner Estimates of Patient Characteristics

PCNP nurse practitioners who participated in the survey provided estimates of characteristics that described their patient population. Over half (51.5%) of the nurse practitioners indicated that 8-20% of their patients have chronic pain, while an average estimate of 13.7% of patients were being treated with opioids. When asked what percentage of patients being treated with opioids eventually develop tolerance, physical dependence, and/or addiction, almost half of the nurse practitioners responded between 5-19%. Results were varied when asked to estimate how many of their patients arrive at the ultimate goal of treatment, as shown in Table 2.

Table 2

Nurse Practitioner Estimates of Patient Characteristics Related to Chronic Pain Management

Estimated Percentage	Chronic Pain n (%)	Treated with Prescription Opioids n (%)	Estimated Percentage	Reach Treatment Goal n (%)
<3%	0 (0%)	5 (15.2%)	N/A	2 (6.1%)
3-7%	6 (18.2%)	10 (30.3%)	<1%	1 (3.2%)
8-14%	9 (27.3%)	6 (18.2%)	1-4%	7 (22.6%)
15-20%	8 (24.2%)	6 (18.2%)	5-9%	2 (6.5%)
21-34%	5 (15.2%)	2 (6.1%)	10-19%	8 (25.8%)
35-50%	2 (6.1%)	4 (12.1%)	20-34%	4 (12.9%)
>50%	3 (9.1%)	n/a	35-50%	1(3.2%)
			>50%	8 (25.8%)

Note: Answers from questions 3a, 3b, and 3d

Nurse Practitioner Opioid Prescribing Practices

To establish inclusion criteria and characterize overall prescribing practices, participants were asked whether or not they prescribe opioids (2a), how many (2b), and which ones (2c). Of the 33 nurse practitioners who completed question 2a, 27 (81.82%)

indicated they prescribe opioids. Among all participants, an average of 11.7 opioids are prescribed in a typical week; although over half of the participants (18 of the 33) indicated writing only 1-10 opioid prescriptions per week. Participants stated that the most commonly prescribed medications were hydrocodone (87.5%), oxycodone both immediate and extended release (71.89%), codeine (25%), fentanyl (9.38%), morphine (9.38%), propoxyphene napsylate/APAP (3.13%), and tramadol (3.13%). It should be noted that on the survey, oxycodone ER had Percocet as an example next to it, which is the incorrect form of oxycodone. This may have lead providers to incorrectly state they prescribed one form oxycodone more than the other form.

In question 5 participants were asked to rank order the methods they use to monitor patient responses to opioids, from 1 = most commonly used method to 4 = least commonly used method, as shown in Table 3 below. The lower the average rating for each possible response denotes the more commonly the method was used, with the majority of participants ranking pain control number 1 followed in order by restoration of patient's daily function, emergence of aberrant drug-related behavior, and adverse physical event on patient's health.

Table 3

Most Commonly Used Methods to Monitor Patient Response to Opioids

Answer Options	Most Commonly Used Method	2nd Most Common	3rd Most Common	4th Most Common	Rating Average	Response Count
Pain control	14	6	4	4	1.93	28
Restoration of patient's daily function	10	11	3	3	1.96	27
Adverse physical events on patient's health	2	9	9	9	2.86	29
Emergence of aberrant drug-related behavior (tolerance, physical dependence, addiction)	5	4	14	10	2.88	33

Note. Data from question 5

In question 11, participants were asked how they approach patients when they first present with opioid dependence (11a) and how they manage patients with chronic pain who they have denied opioids for any reason (11b) or were denied opioids because they are dependent on opioids (11c). In the first part of the question, when asked how they approach patients who show signs of dependence, the majority of responses indicated that nurse practitioners are most likely to discuss the opioid dependence with the patient (61.3%) or refer the patient to an appropriate treatment program for opioid dependence (22.6%). When asked how they would manage chronic pain in those patients they denied opioids for any reason (question 11b), most nurse practitioners selected they would suggest alternative medicine treatments (38.7%) or manage patients with non-opioid medications (32.3%). Similar responses were given when participants were asked how they would manage chronic pain in patients with opioid dependence, as seen in Table 4. One participant wrote in that she or he was not sure how to handle opioid

dependence. The similarity in responses suggests that opioid dependence was the reason in “any reason” that nurse practitioners typically denied opioids.

Table 4

Nurse Practitioner Management of Chronic Pain in Opioid Dependent Patients

Chronic Pain Management Options	n (%)
Opioid medications	2 (6.4%)
Non-opioid medications	8 (25.8%)
Recommend alternative medicine	11 (35.5%)
Referral to another physician	8 (25.8%)
Removal from your medical practice	0 (0.0%)
Unsure what to do	1 (3.2%)
N/A	1 (3.2%)

Note. Data from 11c.

Nurse Practitioner Knowledge in Regards to Prescription Opioids

While nurse practitioners on average rated their knowledge and comfort prescribing these medications, they did acknowledge that opioid medications can be dangerous. All participants responded that education played an important role in prescribing these medications. Question 4 asked participants to rate their level of knowledge/comfort with treating/managing chronic pain, state and federal guidelines for treatment of chronic pain, and discussing opioid dependence with their patients. The mean rating on a 5-point Likert scale, where 3 = average and 5 = excellent, was >3. Participants’ rating of their knowledge of managing patients with opioid dependence was below average, at 2.88. This suggests that managing patients who have developed some form of addiction or dependence on the medication can be challenging.

Overall, responses by nurse practitioners suggest that the majority (80.6%) felt their education was at least satisfactory (8b) in prescribing opioids. Only 19.4% stated their education was unsatisfactory, compared to 26.7% in dealing with opioid dependence

(9b). Participants overwhelmingly answered that nursing education was essential (8a) in managing patients with opioids (93.6%) as well as dealing with dependence (9a, 80%).

Nurse practitioners rated their knowledge of prescription opioid most frequently a 3 on a 1-5 scale in most categories as seen in Table 5. When questioned if they would participate in further training 24 of 31 (77.4%) answered they at least probably would attend further training. It was clear that nurse practitioners felt that their education was important in educating students to deal with these issues.

Table 5

Nurse Practitioner Rating of Knowledge of Prescription Opioid Use

Survey Question	1	2	3	4	5	Mean
4. How would you rate your knowledge / comfort with the following: (n = 33)						
Treatment / management of chronic pain	2	2	19	5	5	3.27
State & federal guidelines for treatment of chronic pain	2	3	17	5	6	3.30
Screening for opioid dependence	1	2	18	8	4	3.36
Discussing opioid dependence with your patients	1	2	11	11	8	3.70
Treatment / management of opioid dependence	2	11	11	7	2	2.88
12. If you were provided with the necessary training, support, and resources to treat patients for opioid dependence and/or addiction, how willing would you be to do so? (n = 31)	0	2	5	14	10	4.03

Note. Data from question 4 and 12. Rating scale: 1 = very poor, 2 = poor, 3 = average, 4 = above average, 5 = excellent

Nurse Practitioner Beliefs Related to Chronic Pain and Opioid Dependence

Nurse practitioners frequently selected they had concerns for patients developing undesirable side effects with opioid medications. Question 3c, 6, 7, 10, 13 evaluated the underlying beliefs of nurse practitioners in regards to prescribe opioid medications.

Question 3c examined nurse practitioners' concern for their patients who may develop tolerance, physical dependence, and/or addiction in the patients with chronic

pain who are treated with opioids. The majority of nurse practitioners were at least definitely concerned (72.7%) for patients developing these undesirable side effects.

Nurse practitioner estimates of the percentage of patients with chronic pain (question 6) and opioid dependence in the United States were only slightly higher than those for their individual practice setting. Participants estimated the average percentage of patients with chronic pain in the United States at 27.5% compared to 25.1% where they practice. Estimated percentage of patients who are physically dependent on prescription opioids in both their practice and the United States, however were, significantly different. More than half of participants (51.6%) estimated that >10% of the patients in their own practice were dependent on prescription opioids as compared to the majority (83.83%) estimating this was the case in the US. Results can be seen in more detail in Table 6.

Table 6

Nurse Practitioner Estimates of Chronic Pain and Opioid Dependence in Practice and in the United States

6 a/b. Percentage of patients you believe suffer from chronic pain			7a/b. Percentage of patients you believe are physically dependent on a prescribed opioid		
Estimated Percentage	At work	United States	Estimated Percentage	At Work	United States
<3%	1 (3.1%)	1 (3.1%)	<1%	1 (3.2%)	0 (0.0%)
3-7%	4 (12.5%)	1 (3.1%)	1-4%	8 (25.8%)	1 (3.2%)
8-14%	7 (21.9%)	5 (15.6%)	5-9%	6 (19.4%)	4 (12.9%)
15-20%	5 (15.6%)	12 (37.5%)	10-19%	4 (12.9%)	12 (38.7%)
21-34%	10 (31.3%)	5 (15.6%)	20-34%	4 (12.9%)	5 (16.1%)
35-50%	1 (3.1%)	4 (12.5%)	35-50%	5 (16.1%)	6 (19.4%)
>50%	4 (12.5%)	4 (12.5%)	>50%	3 (9.7%)	3 (9.7%)

Note. Data from question 6a, 6b, 7a, and 7b.

When asked why they believe patients who are dependent on opioid begin using opioids (question 7c), the majority of nurse practitioners responded that they believed

patients started taking opioids due to suffering legitimate pain (58.1%) or following a medical procedure (29.1%). In response to how they believed patients obtained their first opioids (question 7d), participants indicated that they believed opioids were obtained by a valid prescription (77.4%) as opposed to being obtained by a prescription written for someone the patient knew (19.4%) or “from the street” (3.2%).

The major deciding factor on whether to write an opioid prescription varied among participants, with the most prominent concerns indicated being misuse/abuse (32.3%) or adverse effects on the patient’s health (22.6%). When asked if they believed their prominent concern in deciding whether or not to write an opioid prescription, as indicated in Table 7, resulted in the denial of opioids to some or all patient with chronic pain where they work (question 10b), 73.1% indicated yes. In addition, the majority of nurse practitioners agreed that the legal ramifications of writing opioid prescriptions impact (51.6%) and reduce their willingness (44.4%) to prescribe opioids (questions 10c, d).

Table 7

Nurse Practitioner Concerns Related to Decisions to Prescribe Opioids

Prominent Concerns	n (%)
Development of tolerance	1 (3.2%)
Physical dependence	5 (16.0%)
Addiction	1 (3.2%)
Misuse / abuse of the prescribed opioid by the patient	10 (32.3%)
Adverse physical effects on the patient's health	7 (22.6%)
Selling / diversion of the opioid to an unintended user	3 (9.7%)
Incomplete pain relief	3 (9.7%)
Legal liability	0 (0.0%)
Free text: All of the above	1 (3.2%)

Note. Data from question 10a

When asked about beliefs regarding the use of opioids to manage chronic pain (question 13), the majority of participants (48.4%) indicated drug related factors, such as addiction potential, cost, and access, as the major problem, with patient-related factors (noncompliance) as the 2nd most frequent response (22.6%), as can be seen in Table 8. These two answers could be viewed as related since a patient who develops addiction or is unable to obtain the opioid as a result of cost or access may become noncompliant with taking the medication at the frequency prescribed.

Table 8

Nurse Practitioner Beliefs Regarding the Major Problem in Using Opioids to Manage Chronic Pain

Major Problems	n (%)
Patient-related factors (noncompliance)	7 (22.6%)
Drug-related factors (addiction-potential, cost, ease of access, etc.)	15 (48.4%)
System related factors (insurance company involvement, legalities, etc.)	2 (6.5%)
Practice-related factors (willingness, time, resources, staffing issues, etc.)	5 (16.1%)
N/A	1 (3.2%)
Write in: all of the above	1 (3.2%)

Note. Data from question 13

Discussion

The data from this survey was used to analyze the knowledge, beliefs, and practices of Pennsylvania nurse practitioners to better understand their prescribing habits. Questions were categorized to evaluate demographics of the nurse practitioners and their patients, as well as knowledge, beliefs, and practices of nurse practitioners.

Opioid prescribing practices of Pennsylvania nurse practitioners. Opioid medications are commonly prescribed by nurse practitioners in Pennsylvania. Eight-two percent of Pennsylvania nurse practitioners responding to the survey indicated that they write prescriptions for opioid medications, with hydrocodone prescribed most often.

Participants indicated pain control as the method they most commonly used to monitor patient response to opioids. Yet, despite prescribing on average 11.7 opioids per week, more than half of the nurse practitioners (58.1%) believe that satisfactory pain control is achieved in less than 20% of patients. This failure to achieve treatment goals suggests there is room for improvement in current chronic pain management practices.

Opioid dependence was the primary reason for not prescribing opioids. These findings are consistent with those of Jamison et al. (2014) and Wilson et al. (2013), where physicians identified risk of opioid abuse or addiction as the greatest impediments to prescribing opioids. Most practitioners stated that they would discuss the issue with the patient if they believe the patient had developed dependence on the medications. Most often, nurse practitioners would either attempt to manage the patient with alternative methods or would prescribe non-opioid medications.

Prescription opioid knowledge of Pennsylvania nurse practitioners. Nurse practitioner participants self-identified their knowledge of state and federal guidelines for treatment of chronic pain, and knowledge and comfort with managing chronic pain or discussing opioid dependence with their patients, as average. An overwhelming majority of participants (93.6%) believe nurse practitioner education should play an essential role in teaching the various aspects of chronic pain management, with 80.6% rating their education in prescribing opioids as at least satisfactory. On the other hand, nurse practitioners' self-identified knowledge and comfort with discussing opioid dependence with patients or treating opioid dependent patients falls just below the rating of average. More than a quarter of participants (26.7%) rated their education in how to address opioid dependence as unsatisfactory and 77% indicated they would “probably” or

“definitely” treat patients for opioid dependence if given the necessary training, support, and resources. This suggests that there is a knowledge deficit that could be improved upon and an opportunity for changes in how nurse practitioners are educated. Lack of knowledge and training to effectively treat chronic pain with opioids has been identified by other researchers (Jamison et al., 2014; Keller et al., 2012; Wilson et al., 2013; Wolfert et al., 2010).

Prescription opioid beliefs of Pennsylvania nurse practitioners. According to Icek Ajzen’s Theory of Planned Behavior (TPB), an individual’s personal beliefs impact one’s behavior and likelihood of acting in a certain manner. This study attempted to understand the beliefs of Pennsylvania nurse practitioners that may impact prescribing behavior. In question 6 participants were asked to estimate percentages of patients with chronic pain; in question 7 they were asked to estimate percentages of patients receiving opioid prescriptions who they believed were physically dependent on opioids. All agreed that chronic pain was common, both in their own patients (25.1%) and in the United States (27.5%); yet, few (6.25%) estimated that more than 10% of their own patients are opioid dependent compared to the majority (83.83%) estimating that more than 10% of patients across the United States are opioid dependent. This suggests a “not me” attitude by nurse practitioners, in terms of their contribution to the prescription opioid problem. An alternative explanation can be found in the study by Wolfert et al. (2010) where the majority of physicians reported no concerns over the potential legal ramifications of opioid prescribing, countering that they self-regulated their prescribing to avoid being investigated.

Pennsylvania nurse practitioners also believe that almost all those who take prescription opioid medications start through a valid prescription written for their personal use and taken for intended purposes. All of the participants had concerns in prescribing these medications due to the potential dangerous side effects and legal ramifications these medications may have. Drug and patient related factors, such as abuse and dependence, were most commonly identified as the primary concern with prescribing opioid medications.

Limitations

The relatively short time frame to collect data was the major limitation of this study. The invitation to participate in the study was distributed through email over 18 days. A longer time frame or incentive for participating may have elicited a larger sample. In addition, the invitation to participate states that the survey is a 13 multi-part question survey; however, if numbered individually, the survey had 40 questions. The length of the survey may have stopped some potential nurse practitioners from participating, thus the small number of actual surveys fully completed.

The survey instrument itself was a limitation. The sample was also obtained from a single professional organization in Pennsylvania, which limits generalization of findings to other healthcare professions or geographic locations. Members who did not see the email were not able to participate. Specific questions, such as those asking participants to estimate how many opioid prescriptions they write per week, percentages of patients with opioid dependence, what opioids they prescribe the most, and what percentage of their patients have chronic pain, rely on recall that might not be a true representation of actual practice. The anonymous nature of this study and inability to

view a specific individual's answers, made it impossible to discern answers between opioid and non-opioid prescribers.

Summary

The majority of survey participants were family nurse practitioners who practice in private primary care offices or practices. Eighty-two percent of the Pennsylvania nurse practitioners prescribe prescription opioids with the major goal being to manage chronic pain or restore daily function. Over half estimated that as many as 20% of their patients have chronic pain, with 13.7% being treated with opioids. Hydrocodone was the most commonly prescribed opioid.

The majority of Pennsylvania nurse practitioners believe that their education to prescribe and manage patients who take opioid medications was at least adequate. They believe that most patients start using the medications through legal prescriptions intended to manage pain; the nurse practitioners prescribe these drugs despite having concerns for abuse. Alternative therapies and non-opioid medications are the prominent routes of treatment in those who develop physical dependence on opioids.

According to Icek Ajzen's Theory of Planned Behavior (TPB), an individual's personal beliefs impact one's behavior and likelihood of acting in a certain manner. This study attempted to understand the knowledge, beliefs, and practices of Pennsylvania nurse practitioners to evaluate their education, gather information that could be used to predict, and estimate prescribing habits.

Chapter 5

Summary, Conclusions, and Recommendations

Prescription opioid abuse and prescription rates have been increasing over the last decade. To explore this problem, invitations to participate in an anonymous survey of opioid prescribing knowledge, beliefs, and practices, were distributed to Pennsylvania nurse practitioners through the PCNP. The research questions were designed to attempt to understand the knowledge, beliefs, and opioid prescribing practices of Pennsylvania nurse practitioners.

Thirty-four members participated in the survey of which 31 returned surveys with all questions answered. The 13-question multipart survey was modified from an instrument developed by Keller et al. (2012) for a similar study involving physicians. The results were analyzed through frequency distributions and means.

Practices of Prescribing Opioids

Eighty-two percent of survey participants indicated they prescribe opioid medications. Nurse practitioners indicated that potential for abuse was the highest ranking concern in regards to prescribing opioid medications. This suggests that they are cognizant of the potential serious side effects opioid medications may have. Sixty-one percent of nurse practitioners state that they address potential dependence by having a discussion, although in question 4 practitioners rated their knowledge/comfort discussing this slightly below average. This could potentially lead to a less desirable outcome than someone who is confident in their training. One nurse practitioner wrote in an answer to question 11c that she or he didn't know how to address opioid dependence.

Knowledge of Prescription Opioids.

The mean score in regards to prescribing, treating, discussing, and knowledge of federal laws was scored higher than a 3 on a 1 to 5 scale, while their knowledge and comfort with managing patients with opioid dependence was slightly below average, at 2.88. This demonstrates that managing patients who have developed some form of addiction or dependence on the medication can be challenging. Overall, responses by nurse practitioners participating in the study suggest that the majority felt their education was at least adequate. Only 19.4% stated their education was unsatisfactory, but only 16.1% stated their education was excellent in question 8b. Participants overwhelmingly (93.6%) answered their nursing education was essential in managing patients with opioids and indicated they probably or definitely would treat patients for opioid dependence if provided with the necessary training, support, and resources. With trends of increasing opioid demand and prescriptions there is an argument that nurse practitioners should be rating their training to prescribe opioids higher or given the education to close the knowledge gap.

Beliefs Related to Prescription Opioids

Participants estimated that the average percentage of patients with chronic pain in the practice was similar to the average percentage in the US. Yet more than half of the nurse practitioners (58.1%) believe that satisfactory pain control is only achieved in less than 20% of their patients, which suggests that nurse practitioners believe that current medical treatments are not adequately managing patients with chronic pain. Reasons for this may include reluctance to prescribe opioids or suboptimal prescribing to meet treatment goals. In support of this view is participants' rating of their concern for the

development of tolerance, physical dependence, and or addiction as “definitely” when prescribing opioids to treat chronic pain. This may also explain why participants estimated opioid dependence to be higher in the US than it is in their own practice.

Implications for Nursing

There is an argument to be made that there is room for improvement in the training of nurse practitioners in managing patients with chronic pain. With increasing trends in abuse and prescriptions of these potentially dangerous medications, nurse practitioners should rate their educational preparation, comfort, and knowledge in the management of chronic pain and opioid dependence higher. As nurse practitioners continue to advance their level of care, they must also increase their education to follow the trends of current practice. With an increasing role of prescribing these medications and the growing trends of independent practice, nurse practitioners will be in a position to have an impact on the number of patients who reach treatment goals without adverse effects to opioid medications. While most nurse practitioners stated they would discuss dependence with their patient, it is unknown if they have any training on what to say or how to address the topic. Schools can use this data to include more education on managing patients with opioids, and how to deal with the potential negative side effects such as dependence.

Recommendations for Further Research

Most Pennsylvania nurse practitioners who participated in the study indicated an average level of comfort in managing patients with opioids according to question 4, but further investigations are still required. While this shows nurse practitioners are somewhat comfortable prescribing and managing these medications, the fact still remains

that an increasing number of prescriptions and abuse are on the rise. One of the limitations of selecting members from a single professional organization could be improved by broadening the sample pool and size by distributing survey invitations to multiple health systems across the state. In addition, there is potential for a larger scale study to investigate whether prescription trends actually match the perceptions/beliefs in prescribing opioids. This would include a system of recording how many and what specific opioid prescriptions are written, as well as an accurate count of patients that are being managed with these medications to obtain actual statistics instead of estimates of patient characteristics. There would be value in comparing data from this small scale study to see if the estimates correlate strongly with the actual habits of participants.

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**Appendix A
IRB Approval**

CLARION UNIVERSITY OF PENNSYLVANIA
Institutional Review Board

DATE: June 1, 2016

FROM: Rhonda Clark, Chairperson
Institutional Review Board

TO: Nicholas Caruso

RE: ARA Approved

Your application for Research Approval, Pennsylvania Nurse Practitioners' Opioid Prescribing Knowledge, Beliefs, and Practices, Project 64-15-16, has been reviewed and approved as exempt. **Be sure that you include your IRB project number in your project cover letter and in any correspondence with the Administrative Office. Also, please include your approval number from the initial application, if submitting an addendum. Your IRB project number should appear on your informed consent and/or your survey instrument.**

Please review the following IRB policy guidelines, which cover your responsibilities as primary investigator:

You must file written permission, which serves as consent, from the institution or facility with the Administrative Office (included in your IRB application). You must also retain all signed consent forms, if required for participation, for a period of three years after the end of the research approval period.

If your research extends beyond one year, you must submit a request for extension and an annual progress report.

Principal investigators are responsible for reporting the progress of the research to the Administrative Office no less than once per year. Problems involving risks or changes in the research must be reported immediately.

You must promptly report injury and/or unanticipated problems involving risks.

Principal investigators are responsible for promptly reporting (in writing) to the Administrative Office, through their department heads, any injuries to human subjects and any unanticipated problems, which involve risks to the human research subjects or others.

You must report changes in the research.

Research investigators are responsible for promptly reporting (in writing) to the Administrative Office, through their department heads, any proposed changes in a research activity.

Changes in research during the period for which IRB approval has already been given **shall not be initiated** by the research investigators **without IRB review and approval**, except where necessary to eliminate apparent immediate hazards to the subject. In such occurrence the IRB is to be notified as soon as possible.

You must report noncompliance with this assurance.

Research investigators and department heads are responsible for reporting promptly to the Administrative Office and the IRB any serious or continuing noncompliance with the requirements of this assurance or the determinations of the IRB.

If your project is under continuing review (Expedited and Full-Board Applications), you may be requested to produce evidence that your research is following the guidelines provided in your application. If your project is chosen for an audit, you will be notified.

You must submit a research conclusion form, available on the IRB site, once your research project is completed. Please submit the research conclusion form to irb@clarion.edu.

Clarion University of Pennsylvania
840 Wood Street, Clarion, PA 16214
814-393-2774 (Phone)
814-393-2825(Fax)

Appendix B
Pennsylvania Coalition of Nurse Practitioners Approval

Good morning Nicholas,

I was able to get in contact with all members of the committee and they have decided to accept your proposal. Congratulations!

When you get a chance, please give me a call directly at 412-243-6149 x109 and I can take the \$100 credit card payment over the phone.

Could you also provide a direct link to your survey? This will be distributed electronically.

Please let me know if there is anything else I can do for you or if you have any questions.

Regards,

Ed Phillipps

Pennsylvania Coalition of Nurse Practitioners (PCNP)

2400 Ardmore Boulevard, Suite 302

Pittsburgh, PA 15221

Phone: 412-243-6149 x109 | Fax: 412-243-5160

Email: pcnp@pacnp.org

www.pacnp.org

Appendix C

Invitation to Participate in Pennsylvania Nurse Practitioners' Opioid Prescribing Knowledge, Beliefs, and Practices Study

Dear Potential Participant,

My name is Nicholas Caruso and I am a graduate student in Clarion & Edinboro Universities' joint Master of Science in Nursing - Family Nurse Practitioner Program. I am requesting your participation in a study aimed at describing Pennsylvania nurse practitioners' opioid prescribing knowledge, beliefs, and practices. You are being invited to participate in this study as you have been identified as a member of the Pennsylvania Coalition of Nurse Practitioners, and, as such, may be eligible to participate if you are also a) currently practicing as a nurse practitioner in Pennsylvania and b) prescribe opioids as part of your practice.

The online survey consists of 13 multi-part questions adapted from a 2012 study conducted by Keller et al. that ask about you and your opioid prescribing knowledge, beliefs, and practices. The survey will take approximately 10 minutes to complete. No information, such as your name, email, or IP address, will be collected that can be traced to you as an individual. Participation is also completely voluntary. You may choose to not participate, not answer all questions, or to exit the survey at any time.

Below is a consent form for you to review that contains additional information about this study and who to contact if you have any questions. Completing the survey confirms that you have read all of this information and voluntarily consent to participate in this study.

UNIVERSITY AFFILIATION: Clarion University of PA Administrative Office, 108
CarrierAdministration Building, Clarion, PA 16214, 814-393-2337

TITLE: Pennsylvania Nurse Practitioners' Opioid Prescribing Knowledge, Beliefs, and
Practices

PRINCIPAL INVESTIGATOR:

Nicholas Caruso, BSN, RN
Email: N.S.Caruso@eagle.clarion.edu
724-448-8229

FACULTY ADVISOR:

Debbie Ciesielka, DEd, ANP-BC
Clarion University
840 Wood St.
Clarion, PA 16241
Email: dciesielka@clarion.edu
814-393-1851

DESCRIPTION: I understand that I have been asked to participate in this research project which is a study of Pennsylvania nurse practitioners' opioid prescribing knowledge, beliefs, and practices. The goal is 30 participants. Any currently practicing nurse practitioners who prescribe opioids as part of their practice are eligible to participate. The survey consists of 13 questions that can be completed online using the link provided. The survey will take approximately 10 minutes to complete.

RISK AND BENEFITS: There are no risks for participation in this study. The benefit to participating in this study is to increase our understanding of potential barriers to treating chronic pain with opioids.

COST AND PAYMENTS: There is no cost or compensation to me as a participant in the study.

CONFIDENTIALITY: I understand that no personal information will be linked to my survey responses. To further insure safety of my identity, responses will be collected through SurveyMonkey's servers with firewall and data encryption security. At the completion of the study, all data will be kept in a secure, password protected format with access limited to the researcher. Results of the study will only be used for scholarly purposes. My identity will not be revealed in any publication of results of this study.

RIGHT TO REFUSE OR END PARTICIPATION: I understand that my participation is completely voluntary. I may refuse to participate in this study, not answer all questions, or withdraw at any time.

[Please click here to participate in the survey](#) (This link shows a preview of the electronic survey, which will no longer be a preview after IRB approval)

Sincerely,

Nicholas S. Caruso

Appendix D

Practices and Perceptions of Nurse Practitioners With Regard to Chronic Pain and Prescription Opioid Use Tool.

Question 1

a. What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

b. What is your gender?

- Female
- Male

c. With which race do you identify yourself?

- White/Caucasian
- African American
- Hispanic
- Native American
- Other (please specify)

d. How many years have you been practicing as nurse practitioner?

e. In what specialty/specialties did you receive your education? Check all that apply

- Acute Care NP
- Adult Nurse NP
- Adult-Gerontology Acute Care NP
- Adult-Gerontology Primary Care
- Adult-Gerontology Primary Care-Mental Health NP
- Family NP
- Gerontological NP
- Neonatal
- Pediatric-Mental Health NP
- School NP
- Women's Health NP
- Other (please specify)

f. Which of the following best describes your principal nurse practitioner practice setting?

- Private physician office/practice
- Private NP office/practice
- Clinic (including FQHC, community, hospital-based)
- Retail-based health service
- School/college health service
- Urgent care clinic
- Hospital-inpatient
- Hospital emergency department
- Hospice (including home hospice)
- Long-term or elder care
- Correctional facility
- Community health
- Employee health
- Academia
- Other (please specify)

g. What is the specialty of the practice for your principal nurse practitioner position?

- Primary Care
- Pediatric Subspecialties
- Internal Medicine Subspecialties
- Psychiatry/Mental Health
- Surgical Specialties
- Other (please specify)

Question 2

a. Do you prescribe opioid analgesics for chronic non malignant pain (referred to hereafter as 'chronic pain')?

Yes

No

b. How many opioid prescriptions do you write in a typical week?

None

1-10

10-20

30-40

40-50

50-60

Greater than 60

c. Which opioid(s) do you most commonly prescribe for chronic pain (check all that apply)?

Hydrocodone (Vicodin, Norco)

Oxycodone ER (Percocet)

Oxycodone IR

Fentanyl

Propoxyphene Napsylate / APAP (Darvocet -N)

Codeine (Tylenol #3)

Other (please specify)

Question 3

a. Approximately what percentage of all your patients current has chronic pain (select one)?

- <3%
- 3-7%
- 8-14%
- 15-20%
- 21-34%
- 35-50%
- >50%

b. Approximately what percentage of all your patients is current being treated with prescription opioids (select one)

- <3%
- 3-7%
- 8-14%
- 15-20%
- 21-34%
- 35-50%

c. How concerned are you regarding the development of tolerance, physical dependence, and/or addiction in the patients with chronic pain whom you are treating with opioids (select one)?

- 1 (not at all concerned)
- 2 (slightly concerned)
- 3 (moderately concerned)
- 4 (definitely concerned)
- 5 (very concerned)
- N/A

d. In your practice approximately what percentage of patients treated for chronic pain (with any treatment, opioid or non-opioid) arrives successfully at the ultimate goal of the treatment?

- N/A
- <1%
- 1-4%
- 5-9%
- 10-19%
- 20-34%
- 35-50%
- >50%

e. Approximately what percentage of patients where you work are treated for chronic pain with prescription opioids eventually develops evidence of withdrawal, tolerance, physical dependence, and/or addiction to the opioids?

- N/A
- <5%
- 5-19%
- 20-34%
- 35-49%
- 50-64%
- 65-80%
- >80%

Question 4

How would you rate your knowledge / comfort with the following
(1 - very poor, 2 - poor, 3 - average, 4- above average, and 5 - excellent)

Treatment / management of chronic pain	<input type="text"/>
State & federal guidelines for treatment of chronic pain	<input type="text"/>
Screening for opioid dependence	<input type="text"/>
Discussing opioid dependence with your patients	<input type="text"/>
Treatment / management of opioid dependence	<input type="text"/>

Question 5

Please rank from 1 (most commonly used method) to 4 (least commonly used method) the methods by which you monitor patient response to opioid treatment (rank from 1-5 if 'Other' is applicable)

<input type="text"/>	Pain control
<input type="text"/>	Restoration of patient's daily function
<input type="text"/>	Adverse physical events on patient's health
<input type="text"/>	Emergence of aberrant drug-related behavior (tolerance, physical dependence, addiction)

Question 6

a. Approximately what percentage of all patients do you believe suffer from chronic pain where you work?

- <3%
- 3-7%
- 8-14%
- 15-20%
- 21-34%
- 35-50%
- >50%

b. Approximately what percentage of all patients do you believe suffer from chronic pain in the United States?

- <3%
- 3-7%
- 8-14%
- 15-20%
- 21-34%
- 35-50%
- >50%

Question 7

a. Where you work, of the patients who receive a prescription for an opioid, approximately what percentage do you believe are physically dependent on the prescribed opioid?

- <1%
- 1-4%
- 5-9%
- 10-19%
- 20-34%
- 35-50%
- >50%

b. In the United States, of the patients who receive a prescription for an opioid, approximately what percentage do you believe are physically dependent on the prescribed opioid?

- <1%
- 1-4%
- 5-9%
- 10-19%
- 20-34%
- 35-50%
- >50%

c. In your opinion, why do most patients who are dependent on opioids begin using opioids (choose one)?

- Peer pressure
- Curiosity
- Suffering from legitimate pain
- Following a medical procedure
- Other (please specify)

d. How do you believe most of these individuals obtained their first opioids (choose one)?

- Their own prescription
- A prescription written for someone they knew (i.e., friend or relative)
- Obtained from "the street"

Question 8

a. How important a role do you believe nurse practitioner education should play in teaching the various aspects of **chronic pain** and its management?

- Essential
- Useful
- Little Relevance
- Useless

b. Please rate how your medical education and training have prepared you to address **chronic pain** in your practice?

- Excellent
- Good
- Satisfactory
- Unsatisfactory

Question 9

a. How important a role do you believe nurse practitioner schools and training programs should play in teaching the various aspects of **opioid dependence** and its management?

- Essential
- Useful
- Little Relevance
- Useless

b. Please rate how your nurse practitioner education and training have prepared you to address **opioid dependence** in your practice?

- Excellent
- Good
- Satisfactory
- Unsatisfactory

Question 10

a. When deciding whether to write an opioid prescription, what is your most prominent concern (choose one)?

- Development of tolerance
- Physical dependence
- Addiction
- Misuse / Abuse of the prescribed opioid by the patient
- Adverse physical effects on the patient's health
- Selling / diversion of the opioid to an unintended user
- Incomplete pain relief
- Legal liability
- Other (please specify)

b. Do you believe the reason indicated above has resulted in the denial of opioids to some or all patients with chronic pain where you work?

- Yes
- No
- N/A

c. In general, do the legal ramifications of prescribing opioids typically affect your decision of whether to prescribe opioids?

- Yes
- No
- N/A

d. (If Yes)

Do these legal ramifications lessen your willingness to write opioid prescriptions for patients with chronic pain for whom opioids are otherwise indicated?

- Yes
- No
- N/A

Question 11

a. How you do usually approach a patient when he or she first presents to you with opioid dependence (choose one)?

- Discuss opioid dependence with the patient
- Referral to appropriate treatment program for opioid dependence
- Removal from your medical practice
- N/A
- Other (please specify)

b. How do you usually manage chronic pain in patients whom you deny opioids **for any reason** (e.g. fear that the patient will divert, sell, or misuse/abuse the opioid; belief that opioids are not indicated, ect.) (choose one)?

- Non-opioid medications
- Recommend alternative medicine
- Referral to another physician
- Removal from your medical practice
- Other (please specify)

c. How do you usually manage chronic pain in patients who are also dependent on opioids (choose one)?

- Opioid medications
- Non-opioid medications
- Recommend alternative medicine
- Referral to another physician
- Removal from your medical practice
- Other (please specify)

Question 12

If you were provided with the necessary training, support, and resources to treat patients for opioid dependence and/or addiction, how willing would you be to do so?

- 1 (would not use)
- 2 (probably would not use)
- 3 (possibly would)
- 4 (probably would)
- 5 (definitely)

Question 13

What do you believe is the major problem with regard to the use of opioids for management of chronic pain (choose one)?

- Patient-related factors (noncompliance)
- Drug-related factors (addiction-potential, cost, ease of access, ect.)
- System related factors (insurance company involvement, legalities, ect.)
- Practice-related factors (willingness, time, resources, staffing issues, ect.)
- N/A
- Other (please specify)

¹ Thank you for your participation!

Appendix E

Permission to Use and Modify Practices and Perceptions of Primary Care Physicians With Regard to Chronic Pain and Prescription Opioid Use Survey

Thank you for your interest in our work.

Please feel free to use whatever you would like. The survey tool was developed by the medical student, Michael Dlugosz, who is one of the authors, but I do not have a copy of the actual survey; however, you can re-construct it using the Method and Results sections of our publication.

For example:

A categorical question about the “Practice Characteristic” was asked, and the options for the type were “primary care,” “psychiatry,” or “other.” Since the study was conducted in western New York, we assigned a practice location based on the office address and the US census tract designation; the options for the location were “urban,” “suburban,” or “rural.”

I’m sure you get the idea.

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