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Safe Opioid Prescribing Guidelines for APRN Students

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SAFE OPIOID PRESCRIBING GUIDELINES FOR APRN STUDENTS

by

Ashley L. Chartier

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

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in

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Abstract

Advanced Practice Nurses (APRN) are the forefront of healthcare that provide care to individuals, families, groups and communities. With the opioid epidemic on the rise in Rhode Island and nationally, it is imperative to teach APRN students safe prescribing of opioids. The purpose of this study was to increase advanced practice nursing students' awareness and knowledge of safe opioid prescribing guidelines. The design of this study was a quantitative pre- and post-survey, to measure APRN students' knowledge and attitude regarding pain. The study took place at Rhode Island College (RIC) Graduate Nursing Program located in Providence, Rhode Island. The inclusion criteria aligned second semester senior graduate nursing students in Nursing 620- Adult Health/Illness III, Spring Semester of 2017 who were present for class on the day of the pre- and post-survey. The students received lecture content of Safe Opioid Prescribing within the curriculum of Nursing 620. Knowledge and Attitudes Survey Regarding Pain (Ferrell & McCaffery, 2014) was distributed as the pre- and post-survey tool. Twelve pre- and post-surveys were utilized for data collection (n=12). The results demonstrated APRN students have a lack of knowledge and attitudes in pain management, however, participants were able to increase their score following the educational opportunity. Currently, the American Association of Colleges of Nursing [AACN] (2016) reports 204 nursing schools have pledged to incorporate these guidelines into their curriculum. Instituting the CDC Guidelines for Prescribing Opioids for Chronic Pain in RIC graduate nursing school curriculum will increase APRN's knowledge and attitudes on safe prescribing. To date, there is diminutive research available on the knowledge and attitudes of APRN students on safe opioid prescribing. Further research is indicated.

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Safe Opioid Prescribing Guidelines for APRN Students

Background/Statement of the Problem

Prescription drug abuse and dependence is one of the most rapidly growing problems in the United States. Prescription drug abuse accounts for the loss of one life every 19 minutes (Centers for Disease Control [CDC], 2012). The rates of opioid addiction, and overdose are rapidly rising worldwide. The number of deaths related to opioid abuse and addiction, in the recent years, is greater than the number of deaths related to heroin and cocaine combined (CDC). In 2012, the Center for Disease Control (CDC), reported healthcare providers worldwide wrote 259 million prescriptions for opioid medications. Putting this into perspective, the number of opioid prescriptions dispensed is equivalent to one bottle of pills for every American adult. The CDC (2011) reported a fourfold increase in the number of opioid prescriptions sold to pharmacies, hospitals and doctors' offices from 1999 to 2010. Drug abuse and addiction also results in substantial costs on the economic system. In 2007, societal costs of opioid abuse were estimated at \$55.7 billion (Meyer, Patel, Rattana, Quock & Mody, 2014).

The primary challenge for all healthcare practitioners is managing pain while minimizing the risk of addiction. One barrier to safe opioid prescribing is the insufficient education for healthcare professionals. Healthcare professionals lack the knowledge regarding the epidemic of drug exploitation, the benefits of utilizing the prescriptive drug-monitoring program (PDMP), and the costly effect of drug abuse, addiction and dependence on the economic system (Pohl & Smith, 2012).

A growing concern in the United States is drug exploitation. The CDC (2012) reports that 25-66% of patients obtain their opioid medications from someone other than their primary care physician. Those with substance use disorders often see multiple

providers and obtain services through emergency departments, physician outpatient visits, and extended inpatient hospital stays. Identifying drug-seeking behaviors and practicing safe opioid prescribing can decrease the number of unnecessary emergency room visits and hospital admissions.

PDMP are state run electronic-based computer systems that can be utilized to track the number of prescriptions dispensed by practitioners and pharmacies (CDC, 2016a). The use of PDMP provides practitioners with a beneficial way to monitor their patients' prescriptive history. Increasing awareness of PDMP among health care professionals will help to minimize the risk of abuse, addiction, and diversion of opioids.

The opioid epidemic is on the rise and changes in prescribing practices are essential to prevent addiction, abuse, and dependence. To improve patient outcomes, it is essential that clinicians undergo continuing education on pain management, safe prescribing, and substance abuse. The purpose of this study is to increase advanced practice nursing students' awareness and knowledge of safe opioid prescribing guidelines.

Literature Review

A database search of relevant literature using Medline via PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and OVID Technologies (OVID) was conducted. Websites that were explored included The National Institute of Drug Abuse (NIDA), Substance Abuse and Mental Health Services Administration (SAMHSA), Rhode Island Department of Health (RIDOH), and Centers for Disease Control (CDC).

Search terms used for the literature review included: Knowledge of Opioid Prescribing, Overdose of Opioids, Economic Burden of Addiction, Abuse and Dependence of Opioids, Pain Management Guidelines, Prescriptive Drug Monitoring Program. Inclusion criteria included references from 2011-2016, including three additional landmark studies with significant research findings

The comprehensive literature review related to this project included drug abuse, addiction and dependence, mortality related to prescription drug use in the United States, drug abuse, addiction, and the U.S. economy, current education standards on safe prescribing guidelines, the benefits of utilizing prescription drug monitoring programs and practice Guidelines for Safe Prescribing of Opioids

Drug Abuse, Addiction and Dependence

Understanding the difference between drug abuse and drug addiction is essential in order to understand how to manage the opioid epidemic. Drug abuse, dependence and addiction are identified as chronic diseases (National Institute of Drug Abuse [NIDA] (2012b)). Substances that are considered addictive are typically used by chronically ill individuals, often on a daily basis, to manage chronic conditions. Individuals who use

addictive medications are often victims of stigmatization and likened to drug abusers or addicts. These individuals, however, may suffer from poorly managed chronic conditions. The provider's understanding of past medical history and medication regimen is a crucial factor in prescribing opioids for the treatment and management of pain.

Drug abuse is defined by NIDA (2012b) as: "Individuals who use illegal drugs or legal drugs inappropriately. This includes repeated use of drugs to produce pleasure, alleviate stress, to avoid reality, using prescription drugs in other ways than prescribed, and using someone else's prescription (p. 1)." Drug addiction, however, is defined by the American Society of Addiction Medicine (2011) as:

"A primary, chronic disease of brain reward, motivation, memory, and related circuitry in which dysfunction to these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors" (p. 1).

In addiction, the brain changes over time and may challenge an individual's ability to maintain self-control (NIDA). Drug abuse may, in turn, lead to drug addiction.

Preventing drug abuse is an important first step in decreasing the number of individuals addicted to drugs.

No single factor can fully predict whether one single person will become addicted to prescription medication. Certain risk factors may place a patient at higher risk for developing a problem with abuse or addiction. NIDA identifies three risk factors that can lead to drug abuse and addiction: biology, environment and development.

- Biology- Genes, gender, ethnicity and the presence of other mental disorders account for about half of addiction vulnerability.
- Environment- Home life, family system, peer relationships and school experiences are identified environmental risk factors for drug abuse and addiction. Peer pressure, physical and sexual abuse, early exposure to drugs, stress and parental guidance are environmental factors that can affect the likelihood of developing drug abuse and addiction.
- Development- Although drug addiction can happen at any time in a person's life, the earlier the drug use begins, the more likely it will progress to addiction. Teens are particularly at increased risk of developing drug addiction because areas of the brain that control judgement, self-control and decision-making are still developing in teens. Therefore, the chance for risky behaviors is increased.

Addiction is a chronic disease and not simply a behavioral disorder. Addiction affects cognition, emotion, and interaction with others (American Society of Addiction Medicine, 2011). Problems associated with abusing medication include excessive time lost using or recovering from the effects of substances, neglect of home or work responsibilities, focusing on rewards that are part of addiction, continued use despite awareness of risks, and using more frequently or in higher quantities than intended. Changes in cognition often associated with drug abuse include: preoccupation with substance use, altered view of the benefits and risks of drug use, and the inaccurate belief that problems are the result of other factors rather than drug use. Finally, emotional changes in drug abuse can include feelings of increased anxiety, dysphoria, increased sensitivity to stressors, and difficulty identifying and describing feelings. (American

Society of Addiction Medicine, 2011). Drug abuse and addiction are treatable and preventable diseases and educating healthcare professionals regarding these issues is crucial for prevention and recovery (NIDA, 2014).

Physical dependence occurs when the body becomes accustomed to a substance, and relies on that external substance to prevent withdrawal. When that external substance is no longer provided to the body, withdrawal occurs (NIDA). Withdrawal can range from mild to severe. Physical dependence can occur without addiction, and addiction can occur without physical dependence. Understanding the distinction between addiction, abuse and physical dependence is important in terms of treatment, prevention and recovery.

Longo, Parran, Johnson and Kinsey (2000) state that drug-seeking behaviors occur in individuals of all socioeconomic classes. Escalated use, provider shopping and scamming are common drug-seeking behaviors (Longo, et al). Escalated use is commonly noticed when a patient consistently runs out of their medication prior to their next follow-up appointment. Provider shopping may include frequent, visits to the emergency department in order to obtain prescriptions. These individuals often claim to have no health care provider, or to be visiting from out of town (Longo, et al).

Scamming is a drug-seeking behavior that allows the patient to acquire additional medications from a healthcare provider. Scammers may be especially complimentary about the office, proficient at faking illnesses, and knowledgeable about scheduled medications. They might refuse other medications, claim that they are allergic to any non-opioid medication or say that non-opioid medications do not provided any relief (Longo et al., 2000).

Patients who participate in scamming often become angry and hostile when medications they prefer are not prescribed by the healthcare professional. They may threaten the provider with legal action if not prescribed the medication they are requesting.

Understanding drug abuse, addiction, and dependence will ensure that the APRN can correctly identify patients who are abusing or who are at risk for abuse and addiction. Safe opioid prescribing practices promote safe, quality and effective treatment plans among all health care professionals (Longo et al, 2000).

Mortality Related to Prescription Drug Use in the U.S.

Drug abuse and addiction are associated with an increased risk of accidental deaths. Governor Gina Raimondo (2015) identified that overdose deaths rose nearly fifty percent, from 2011-2015. In 2015, the Rhode Island Department of Health [RIDOH] (2016) reported 257 deaths related to accidental drug overdoses. From January 2016 to April 2016, there was 46 confirmed deaths in Rhode Island related to drug overdose (RIDOH). These numbers do not include the many lives saved due to administration of an opioid reversal agent Narcan (naloxone).

Drug overdose is not only a growing problem in Rhode Island, but a national epidemic. There was a 2.8-fold increase in the total number of U.S. deaths related to prescription drugs, and a 3.4-fold increase in the number of related deaths due to opioid medications from 2001 to 2014 (NIDA, 2015). In April of 2016, Gina Raimondo, Governor of Rhode Island, enacted the Overdose Prevention and Intervention Action Plan (OPIAP). The goal of the OPIAP plan is to reduce the number of drug-related deaths in Rhode Island by one-third within three years. The OPIAP focused on four strategies to help decrease drug related deaths. These four strategies are as follows:

- Prevention- Improve the use of PDMP for safe prescribing and maximizing patient safety.
- Rescue- Allow adequate access to Narcan (naloxone) for all individuals.
- Treatment- Expand the availability of medication-assisted treatment (MAT).
- Recovery- Expand access to peer-recovery services.

The OPIAP focuses on increasing education on drug abuse, addiction and dependence.

The increased focus on education will involve teachers, employers, parents, physicians and prescribers. The evidence in rates of overdose and death underscore the need for safe opioid prescribing education for all healthcare providers, first responders and citizens of the community.

A recent retrospective cohort study by Ray, Chung, Murray, Hall and Stein (2016) compared the cause of mortality in patients with chronic non-cancer pain who were prescribed a long-acting opioid, such as: sustained release morphine, controlled release oxycodone, transdermal fentanyl and methadone, as opposed to an alternative pharmacologic intervention for moderate to severe chronic pain. The study included Tennessee Medicaid enrollees initiating a therapy of either long-acting opioids or other alternative medicines from 1999 through 2012. Results demonstrated 23,308 prescriptions for long-acting opioids and 131,883 prescriptions for alternative medications. Patients prescribed long-acting opioids were at an increased risk (1.64 times greater) for an unintentional overdose versus those who were prescribed an alternative pharmacological intervention (Ray et al.). Limitations of this study included lack of classification of cause of death and exclusion of older adults.

In conclusion, NIDA (2015), RIDOH (2016) and Ray et al., (2016) all illustrate the effects that opioids, drug abuse, addiction and dependence has on the health of a patient. Identified mortality related to opioids underscores the importance of instituting education on safe opioid prescribing.

Drug Abuse, Addiction, and the U.S. Economy

Substance abuse has a negative impact on society as a whole, including the workforce and healthcare system. Substance abuse in the United States was estimated to cost over \$600 billion dollars annually and to cause the highest rate of recorded deaths in 2014 (Stempniak, 2016). According to the Office of National Drug Control Policy (2011), the economic cost of drug abuse in the United States was estimated at \$193 billion dollars, in 2007. Total cost included lost labor costs, drug abuse treatment, healthcare related to drug abuse, incarceration and premature death. Criminal justice costs are primarily related to criminal investigations, prosecution, incarceration, and victim costs. For every dollar spent on drug abuse treatment programs, the cost expended on drug related crimes, criminal justice costs and theft decreased by four to seven dollars (NIDA, 2012a). From an economic perspective, prevention and treatment will benefit society as a whole by offering better healthcare treatment programs, decrease interpersonal conflicts, increase workplace productivity, and decrease drug related accidents.

A recent national retrospective cohort study, by Ronan and Herzig (2016), aimed to see if inpatient hospitalizations related to opioid abuse and dependence with and without associated serious infections significantly increased from 2002 to 2012. The authors of the study conducted a chart review of discharge data from 2002-2012 from a

nationwide inpatient sample database. The researchers reviewed International Classification of Diseases, Ninth Revision (ICD-9-CM) discharge codes associated with opioid abuse and dependence, including opioid abuse and dependence with associated infection such as (i.e. endocarditis, osteomyelitis, septic arthritis or epidural abscess). Ronan and Herzig (2016) found that the number of hospitalizations with a known infection related to opioid abuse and dependence was 1.3 percent in 2012 compared to 1.1 percent in 2002. As a comparison, Ronan and Herzig found that the number of hospitalizations with a known infection that was unrelated to opioid abuse and dependence was only 0.3 percent in 2012. Along with increased hospitalization, charges related to opioid abuse and dependence more than tripled in 2012. Hospitalization costs related to opioid abuse and dependence reached \$14.85 billion in 2012 compared to \$4.57 billion in 2002 (Ronan & Herzig). These numbers highlight the growing cost of the opioid epidemic nationwide. Educating future prescribers on safe prescribing practices will also have a beneficial impact on the economy.

Current Education Standards on Safe Prescribing Guidelines

The American Association of Colleges of Nursing [AACN] (2016) identified the lack of integration of content on drug abuse, addiction and dependence education on provider restrictions is a major issue in many educational programs. The goal of AACN is to ensure that students receive education on emerging trends, treatment policies and national guidelines. AACN supported CDC Guidelines for Prescribing Opioids for Chronic Pain to advanced practice nursing students. The guidelines highlight twelve recommendations for the safe prescribing of opioids to patients with chronic non-cancer pain.

The AACN (2016) reports 204 nursing schools and 60 medical schools have pledged to incorporate these guidelines into their curriculum. Although this number is impressive, there are still many nursing and medical programs that have yet to conform to the change. Currently, the AACN is uniting with the American Association of Nurse Practitioners, American Association of Nurse Anesthetists, American College of Nurse Midwives, American Nurses Association, American Association of Clinical Nurse Specialists and the American Association of Nurse Practitioner Faculties to develop a webinar to educate advanced practice nursing (APRN) students, faculty and clinicians on the opioid epidemic and the CDC Guidelines for Prescribing Opioids for Chronic Pain.

Healthcare practitioners, for licensure renewal, are required by state department of health, nationally, to complete continuing medical education (CME) hours. Through CME, practitioners can stay up to date on current practice standards and evidence-based practices. The number of CME hours required for practitioners on pain management and substance abuse is minimal. The current opioid epidemic nationwide requires adequate ongoing education regarding safe prescribing practices.

In a recent review by Davis and Carr (2016), the authors aimed to examine characteristic CME requirements in the United States and their effective dates. The authors systematically collected, reviewed, and coded all state regulations and laws pertaining to required education for license renewal within each state. Davis and Carr found that only seven states enacted provisions that required physicians obtain training in the fields of pain management and controlled substance prescribing in order to renew their license or to practice as a pain management specialist prior to 2012. Physicians that practice in the state of Rhode Island are currently required to complete 40 hours of general

CME requirements every two years for license renewal, none of which were required to be in substance abuse or pain management. In December 2015, the Rhode Island Department of Health enacted a two hour per year CME requirement for topics related to current public health needs which includes safe prescribing of opioids (Davis & Carr, 2016). Only five states currently require clinicians to receive opioid-related CME, and fewer than 25 states have any overdose-related CME requirement. Davis & Carr concluded that clinicians receive inadequate formal training on pain and opioid prescribing despite CME credits being an effective method to maintain a sufficient knowledge base and confidence in clinical practice.

A study by Riley (2003) aimed to assess the degree of knowledge on chronic pain management in nurse practitioners currently practicing in Oklahoma. The study examined the knowledge in pain management and addiction among APRN's. The study categorized nurse practitioners based on years of experience, and self-rating of novice to expert based on Benner's theory. Of 513 identified nurse practitioners, only 149 had addresses accessible for the questionnaire. The results showed that the nurse practitioners who rated themselves at the expert level on the pain management knowledge questionnaire scored higher (11.57%) compared to those who rated themselves as advanced beginners (10.5%) (Riley). The addiction questionnaire results showed that nurse practitioners in the 1-5-year experience group scored the highest (mean score of 1.68) compared to the 20-year group (mean score of 1.29). Scores were thought to be higher in the 1-5-year experience group on the addiction questionnaire as they were more likely to have jobs within a hospital based facility versus a community based facility. This study concludes that

advanced beginner APRNs have a low level of confidence, which underscores the need for education.

According to the Bureau of Labor Statistics (2017), there were 630 nurse practitioners identifiably employed in the State of Rhode Island as of May, 2016. This corresponds to the number of nurse practitioners identified in Riley (2003) study, 513 nurse practitioners. If the study by Riley can address the need for increased education in a small number of APRN in Oklahoma, the findings should be taken into consideration for APRN in the state of Rhode Island as well.

The Benefits of Utilizing Prescription Drug Monitoring Programs

PDMP's are state run databases that track the prescribing and dispensing of controlled substance prescription drugs to patients (CDC, 2016a). PDMP are accessible by all practitioners with prescriptive privileges. PDMP monitors for abuse of prescription drugs, diversion of prescribed medications, and tracks dispensing data (of controlled substances) by pharmacies and prescribers. The program allows pharmacists, physicians, physician assistants and advanced practice nurse practitioners to access information on a patient's prescriptive history. The use of PDMP database may therefore help prescribers reduce the number of people who misuse, abuse or overdose, while making sure all patients have an appropriate pain care plan. Other benefits of the PDMP system are universal use, active management, and the ease of use and access (CDC).

In June, 2014, Rhode Island state legislation passed a bill entitled The Prescription Drug Monitoring Enforcement Program. The aim of the program is to minimize the risk of drug abuse, and dependence, drug diversion, and overdose (RIDOH, 2016). The program requires all prescribers who hold an active Controlled Substance

Registration License (CSR) to register for the PDMP. In March, 2015, the RIDOH added new regulations that required all prescribers check the PDMP prior to initiating an opioid, and/or when a patient is taking an opioid for more than 6 months during a 12-month period. Reviewing pharmacologic history in each individual patient is one way prescribers can identify potential signs of abuse or addiction.

Bao, Pan, Taylor, Radakrishnan, Luo, Pincus and Schackman (2016) recently conducted a study to determine if prescriber behavior regarding opioid pain medication for pain management could be altered by using the PDMP. The authors of the study used the National Ambulatory Medical Care Survey (NAMCS) to review charts of recent office visits by patients. The NAMCS is a representative annual survey of all ambulatory visits that collects data on patients, visit information and the clinician's practice information. The authors reviewed patients ages 18 years and older who reported pain as one of the reasons listed for their visit to a providers' office. The study focused on office visits that occurred in one state out of the twenty-four states that have initiated the PDMP in between 2001 and 2010, looking at both prescribed opioid and non-opioid therapies to assess if prescribers were substituting non-opioid for opioid therapies (Bao, et al).

The results of the study showed that with the implementation of the PDMP database the number of prescribed opioids, specifically scheduled II medications had decreased by 30 percent. Scheduled II medications include, but are not limited to, Hydromorphone (Dilaudid), Methadone, Meperidine (Demerol), Oxycodone (Oxycontin, Percocet), and Fentanyl (Duragesic). Scheduled II medications were ranked as a high risk category of medications for drug dependence, addiction and abuse in this study. It was found in this study that prescribers were able to readily identify misuse and abuse of

controlled substances by using the PDMP database. Prescribers were also noted to be increasingly cautious and attentive when choosing a controlled substance for pain management with the implementation of the PDMP database. The study suggests that the PDMP is helpful in reducing the number of prescribed schedule II medications, which in turn can reduce the risk of addiction and abuse.

A similar study by Patrick, Fry, Hones and Buntin (2016) aimed to examine whether PDMPs can decrease the number of unintentional drug overdose death rates nationally. The study used an interrupted time-series design to examine the number of overdose deaths that occurred during the period of PDMP implementation. Data for the study was obtained from the periods of 1999-2013, with a focus on thirty-five states that implemented PDMP programs (Patrick, et al). The authors collected data from the year that the legislation enacted and implemented the PDMP program. Patrick et al., found that, overdose death rates across the United States substantially increased. In 2013, seven states including Rhode Island, had opioid-related drug overdose death rates of 10 per 100,000 people (Patrick, et al). In those states that implemented the PDMP there was a notable decrease in overdose deaths related to opioids. Drug overdose rates of 6.19 per 100,000 populations were noted in states with an actively implemented PDMP, compared to, overdose rates of 6.50 per 100,000 in those states where a PDMP was not actively implemented (Patrick, et al). Overall, the study indicates that implementations of PDMP programs statewide and nationwide can lower overdose deaths related to opioids.

Comparably, both studies suggest that the active implementation of a PDMP databases may be useful to prescribers and healthcare professionals to prevent abuse, dependence and addiction of controlled substances. It is also shown in both studies that

with implementation of PDMP databases clinicians are more likely to limit the amount of opioids prescribed, decreasing the risk of overdose.

Practice Guidelines for Safe Prescribing of Opioids

Recently the CDC (2016b) instituted guidelines to facilitate safe prescribing of opioids for pain management. The guidelines aim to help prescribers limit the amount of opioids prescribed as a first line therapy, diminish the risks associated with long-term opioid use, and minimize the risk of overdose and opioid use disorders. The guidelines are separated into three sections. According to the CDC, the guidelines do not pertain to prescribers who are treating cancer related pain or those patients who are on palliative care services or end-of-life care.

The first section of the CDC guidelines for prescribing opioids for chronic pain aims to help clinicians determine when an opioid medication should be initiated or continued for chronic pain. Three recommendations for prescribers are made: First, prescribers should attempt to use non-pharmacological and non-opioid pharmacological therapy for chronic pain management. Clinicians should consider prescribing opioid medications for chronic pain at this point only if the expected benefits for both pain and function outweigh risks of therapy and subsequent addiction. Second, the CDC suggests that if opioids are used they should be paired with non-pharmacological therapy and non-opioid pharmacological therapy. Clinicians should only continue opioid therapy if there is a remarkable clinical and meaningful improvement in the patients' pain and function that outweighs the risks. Finally, clinicians should establish realistic goals for pain management, and address the risk vs. benefit of therapy. Reviewing the risks and benefits of opioid therapy for pain management should occur before initiation of any medications

and it should be readdressed frequently during opioid therapy. Clinicians should consider how opioid therapies will be discontinued if the risk outweighs the benefits.

Secondly, the CDC (2016b) guidelines address recommendations for opioid selection, dosage, duration, follow-up, and discontinuation. Clinicians are encouraged to prescribe immediate release opioids instead of extended-release or long-acting opioids when initiating opioid therapy. The CDC emphasizes that clinicians should initially prescribe the lowest effective dose and increase doses slowly based on the need of each individual patient. When titration of dosages is needed, the clinician should carefully reassess the patient's pain, as well as, risks and benefits of treatment. It is suggested that clinicians avoid increasing dosages to greater than 90 milligram equivalents (MME) per day, unless the clinician can rationalize the decision. Limiting the number of pills dispensed to the minimum amount needed for the expected duration of pain, and using the lowest effective dose needed to successfully treat the pain to decrease the risk of abuse is recommended. The CDC recommends clinicians follow up with patients within 1 to 4 weeks of initiation of opioid therapy or dose escalation, then every 3 months. If the clinician finds that the current opioid regimen carries more risks than harm, the opioid should be tapered to a lower dosage with the goal of complete discontinuation of therapy. Initiation of non-opioid therapy should be initiated after complete discontinuation of the opioid is achieved.

The final and third section of the CDC guidelines recommend methods clinicians should utilize to assess the risk and address the potential harms of opioid use. It is recommended by the CDC that clinicians offer Narcan (naloxone) to all patients who are deemed to be at a high risk for opioid overdose (a prior history of overdoses, history of

substance use disorders, higher opioid dosages (≥ 50 MME/day), or concurrent benzodiazepine use). Regular review of the patient's prescriptive history using PDMP data is imperative to determine if the patient is receiving opioid dosages or dangerous medication combinations that put them in the high risk category for overdose. The use of regular urine drug testing is recommended for all patients before initiating opioids and periodically thereafter to assess for prescribed medications, illicit drugs, and other controlled prescription drugs. The CDC (2016b) highly recommends that clinicians avoid prescribing opioids and benzodiazepines concurrently as this can increase the patient's risk of overdose. Lastly, it is encouraged that all clinicians immediately arrange treatment for identified opioid use disorders.

The CDC guidelines for prescribing opioids for chronic pain can be beneficial in improving communication between providers and patients, decrease the rate of overdoses related deaths, and minimize the potential for risk and harm associated with opioid therapy in chronic pain management, as can be concluded by considering the study by Ray, Chung, Murray, Hall and Stein (2016) discussed above. Along with following the CDC (2016b) guidelines, APRN should understand how to avoid legal issues which may arise regarding prescriptive rights. A review by Gerhardt's (2004) focused on how Advanced Practice Nurses (APRN) can avoid legal ramifications by using prescription parameters. The review states that APRNs' should not fear legal ramifications for prescribing opioid medications to those patients who have legitimate disorders and require interventions. Drug-seeking behaviors should not be tolerated and should be recognized early on in treatment. Several strategies to manage drug-seeking behaviors can be utilized. Specific strategies include obtaining a thorough history, conducting a

complete physical assessment, providing education on pain management plans, and medications, and use of pain contracts (Gerhardt, 2004).

APRNs can provide quality, safe and effective care to all patients and minimizing legal repercussions by following risk management procedures, adhering to legal parameters and utilizing guidelines and suggestions for prescribing opioid medications (Gerhardt). According to Gerhardt, when prescribing opioid medications APRN's should: (1) Abide by the state and facility practice rules, (2) collaborate with other interdisciplinary entities, (3) write the prescription appropriately, (4) Prevent lawsuits with education, and (5) document everything in the patient record.

APRNs should keep up to date on current legislative changes, state regulations and facility policies regarding prescriptive rights. The APRN should always consult and collaborate with a physician regarding the patient plan of care. Collaboration with a physician will facilitate safe, effective and quality care to patients, and help confirm the providers' rationale for prescribing practices. Educating patients on prescribed medications and noting the reference used for education in the patients' chart is another way to minimize the risk of legal issues (Gerhardt). A standard of care manual for prescribing, if available, can be a good resource in educating patients on therapies.

Consistent with the CDC (2016b) guidelines for prescribing opioids for chronic pain, Gerhardt also states that writing prescriptions appropriately and prescribing the minimum amount of medication needed until the next follow-up will limit the risk of legal ramifications. When writing a prescription, the APRN should write out the number of pills to be dispensed instead of using the numeric number (i.e. five instead of 5). In opposition to the CDC guidelines, however, Gerhardt affirms that prescribing controlled

release medications over immediate release medications will stabilize the blood levels and it will prevent the exhilaration associated with abusing immediate release medications.

One of the most effective ways for APRN to minimize legal ramifications, noted by Gerhardt (2004), is through documentation. APRN documentation should include, but not be limited to the following: (1) Note that information was provided regarding risk of driving, (2) Risk of drug or alcohol interactions, (3) Detailed description of the education provided and to whom the education was provided, and (4) Document observations of incongruent behavior without resorting to judgement labels (Gerhardt). Lastly, it is suggested that APRN consider the use of contract agreements when prescribing opioid medications. The contact agreement should document that the APRN reviewed the treatment plan, treatment goals, education on specific medication, and informed consent.

A retrospective chart review by Portal, Healy, Satz and McNamara (2015) aimed to “determine whether a voluntary opioid prescribing guideline reduces the proportion of patients prescribed opioids for chronic or minor pain conditions” (p. 21). The study reviewed 13,187 chart records from an adult emergency department from January 2012 to July 2014. The authors reviewed records of patients who presented to the emergency department for dental, neck, back or unspecified pain (Portal, et al). A chart review was conducted prior to instituting specific prescribing guidelines. All of the 31 prescribing physicians who were eligible to partake in this study participated. Of these physicians, 84% felt that their own rate of opioid prescribing had significantly decreased, and 94% indicated that the overall rate of prescribed opioids throughout the emergency department in the hospital had decreased (Portal, et al.,). Comparatively, the rate of prescriptions

written decreased from 52.7% (before guideline initiation) to 29.8% (after guideline initiation). All participating physicians in this study supported the initiation of opioid prescribing guidelines. The results of the study demonstrate that clinical prescribing guidelines overall, especially when supported by clinicians, can minimize the amount of opioids dispensed for pain management.

Portal et al. (2015) and Gerhardt (2004), both highlighted the benefits of implementing the CDC guidelines for prescribing opioids for chronic pain. These studies also underscore the importance of incorporating education on safe prescribing and the CDC guidelines into the APRN graduate school curriculum.

Theoretical Framework

The theoretical framework selected for the study is Malcolm Knowles' Adult Learning Theory. The development of the study combined components and techniques from the adult learning theory. The groundbreaking theory of andragogy and the adult learner was first introduced by Malcom Knowles in the early 1970s. Andragogy is defined as: "the art and science of teaching adults." (Knowles, Holton III & Swanson, 2015, p. 318). The adult learning theory consists of two conceptual foundations: the design theory and the learning theory.

The design theory is a process that facilitates the learner's needs without being dependent on a body of content. The theory involves eight components that help facilitate learning. Knowles' eight components include:

1. Preparing the learner. The learner understands the program's purpose, objectives, and potential benefits of learning.
2. Establishing a climate conducive to learning. The educational climate should be comfortable, inviting, psychologically mutually respectful, collaborative, mutually trustful, supportive, open, authentic, pleasurable and human.
3. Creating a mechanism for mutual planning. Each learning activity must address how to involve the learners in the process of planning. It is important to communicate to the learners that they have an influence in each planned learning activity. The learner can influence learning activities by participating in discussions, asking questions, and choosing what they need to learn. Involving learners can foster a sense of commitment to a learning activity. When learners feel a sense of commitment, an internal desire to learn follows.

Disinterest in learning emerges when adults feel uncommitted. Encouraging teachers to consistently act as a facilitator is an important factor in creating a mechanism for mutual planning. Knowles et al., (2015) states that to prevent a process from backfiring, “all members of the planning committee must be treated in good faith, with real delegation of responsibility, and real influence in decision making” (p.58).

4. Diagnosing the needs for learning. Using a constructing model of desired behavior, performance, or competencies is an effective way to determine the learner’s needs. Knowles et al. states that there are three sources of data used to build a constructing model to diagnose the learner’s needs. These are individual, organization, and society. The individual must be able to identify what he or she wants to learn and achieve from a specific learning activity. The organization must review the program, its objectives, and the societal perceptions based on current literature and research reports. Understanding how the attainment of knowledge can add to the ability to perform better in the learners’ life or career will promote a purpose to learning.
5. Formulating program objectives that will satisfy the learners’ needs. Program objectives can serve as a contract with the learner identifying what content will be learned.

6. Designing a pattern of learning experiences. The needs of the learners' as a whole must be considered when designing a learning activity. Recognizing the needs of the learner can lead to a well-designed learning activity that promotes a proactive, holistic, and integrative approach. This stage should involve selecting an appropriate format for learning (e.g. individual, group and mass activities).
7. Conducting these learning experiences with suitable techniques. This stage is the evaluation of the program's operations. Assessing how the learning experience should be delivered and facilitated is crucial to meeting the needs of the learners. Assessing these key points can help make the program more conducive to the learners' need in the future.
8. Materials and evaluating the learning outcomes and diagnosing the learning needs. Learners who can participate, formulate their own objectives, identify available resources, and evaluate accomplishments will have a higher sense of commitment to future learning. Learning contracts or program objectives can help the learner identify their own objectives and goals and recognize the facilitator's objectives and goals. In order to promote an internal motivation to learn the facilitator must recognize the learners' goals and objectives.

When properly used, these eight concepts help the facilitator create a learning process that actively involves the learner, and increases their knowledge of a specified topic.

The planning and development stages for the study will use the design theory's eight components. The student researcher will assume role of the teacher and facilitator during the educational program, and pre- and post-survey. The development of the educational program is created through collaboration between the student researcher and Nursing 620 Debra Servello, DNP, APRN-ACNP-BC, graduate faculty. To ensure the educational program is appropriate for the participants' education level, collaboration between the student researcher and faculty is essential. The participation of APRN students in a pre- and post-survey enabled the student researcher to assess gaps in education, lack of knowledge, and attitudes on pain among APRN students. The development of the educational program entitled Safe Opioid Prescribing was based on educational needs regarding pain and prescribing guidelines, as identified in the literature review. The student researcher will promote an environment that is safe, supportive, and respectful for all participating APRN students. The educational program is aimed to increase understanding and improve attitudes, and knowledge on pain and safe opioid prescribing in APRN students.

Knowles' et al., (2015) adult learning theory also identifies six assumptions that help identify adult learners. These are:

1. The Need to Know. Adult learners must know "why" they need to learn something before partaking in future learning. At this stage, the facilitator must help the adult learner to see the value in further learning on a specific topic.

2. Self-concept. This stage examines the maturation of adults as learners. Adult learners' self-concept in this stage moves from one of dependence to one of self-direction. Facilitators of learning must avoid talking down to learners so as not to hinder self-directed learning.
3. Experience. Adults learn best from experimental techniques and reflection of experiences. When a learner's experience is undervalued or disregarded, a sense of rejection can result, which weakens the learning capability of the adult learner.
4. Readiness to learn. Adults who are identified as problem-oriented learners tend to focus on obtaining information to help solve problems. Adult learners need to acquire information that they can apply to the present or future.
5. Orientation to learning. Focuses on the motivation to learn is of importance in adult learners. As a person matures, the orientation toward learning shifts focus from subject-centeredness to problem-centered, and focusing on the immediacy of application.
6. Motivation. Adults are more responsive to internal pressures, such as the desire for increased job satisfaction, self-esteem, and quality of life rather than to external motivators such as high status jobs, and higher salaries.

Program objectives prepare the learner, identify the value of learning, state clear intentions, and identify outcomes. The educational program will allow time for discussion, allowing learning to be enhanced through experiences. Educating APRN students on safe opioid prescribing guidelines, management of pain conditions, and identification of opioid use disorders will benefit the future practice of APRN students.

Next, the methodology is discussed.

Method

Purpose

The purpose of this study was to increase advanced practice nursing students' awareness and knowledge of safe opioid prescribing guidelines. It was hypothesized that the educational program will increase APRN students' knowledge and improve attitudes regarding 1). Management and treatment of pain conditions, included but not limited to chronic pain, cancer-related pain, acute-pain and acute on chronic pain, and 2). The CDC Guidelines for Prescribing Opioids for Chronic Pain.

Design

The design of this study was a quantitative, pre and post-survey, to measure APRN students' knowledge and attitude regarding pain. A required educational program was conducted in Nursing 620- Adult Health/Illness III, Spring Semester of 2017, following the pre-survey on Week 1.

Program Objectives

The aim of the educational program, entitled Safe Opioid Prescribing, was to increase advanced practice nursing students' awareness and knowledge on the current opioid epidemic, management and treatment of pain conditions, along with CDC Guidelines for Prescribing Opioids for Chronic Pain. By the end of the educational program, the students will be able to:

- Recognize and recall the current epidemic of drug abuse, addiction and dependence, and the economic burden associated with drug abuse and dependence.
- Reflect and recall their current knowledge and attitudes regarding pain

- Differentiate between drug abuse, addiction and dependence.
- Identify the relevance and potential benefit of Prescription Drug Monitoring Programs in practice.
- Understand how to apply the use of Prescription Drug Monitoring Programs in their practice
- Summarize and apply the Center for Disease Control's Guidelines for Prescribing Opioids for Chronic Pain in APRN practice
- Formulate a basic plan of care for patients who need opioid prescriptions.

Sample

The sample for the study; included master's level advanced practice nursing students enrolled in Nursing 620- Adult Health III during the Spring of 2017. The inclusion criteria for the pre- and post-survey were those students' in attendance of class on the days the surveys were distributed. The sample consisted of Acute Care NP students and CNS students, regardless of their practice background. The anticipated participants included 13 Nurse Practitioner students and 4 Clinical Nurse Specialist students. Due to the important roles of nurse practitioner and clinical nurse specialist in healthcare, both student populations were included in this study.

Site

The study took place at Rhode Island College (RIC), a public college in Providence, Rhode Island. RIC School of Nursing which offers undergraduate and graduate study specialties in Acute Care Nurse Practitioner, Clinical Nurse Specialist, Nurse Anesthetist, Population and Public Health Nursing, and Doctor of Nursing

Practice. The study included student participants in the MSN Program at Rhode Island College.

Procedure

Prior to class, the student researcher introduced herself and invited students to participate in a voluntary survey during their provided class break time, which was not part of lecture requirements. Class time was not used for recruitment or survey. The pre- and post-survey measured APRN students' knowledge and attitudes on pain. A RIC IRB-approved informed consent letter (Appendix A) was handed to all NURS 620 students prior to the beginning of class regarding information on opt-out procedures and implied consent. The informed consent stated the purpose, objectives, and procedures of the study. Students were informed that they were expected to attend class in its entirety as stated in the Nursing 620 syllabus attendance policy, while participation in the pre- and post-surveys remained voluntary. Participants were allotted five minutes to read the consent letter. Participants' completion of the pre- and post-survey acknowledged consent of participation, as stated on the RIC IRB-approved informed consent letter (Appendix A). All materials were provided in English. Participants were expected to maintain the Academic Code of Honesty as referenced in the RIC Graduate Handbook while participating in the pre- and post-survey.

The pre-survey took place during the students' allotted break time, prior to the educational program, in Nursing 620. At the beginning of the scheduled class break, a manila envelope labeled pre-survey was placed at the front of the class. The pre-survey was then distributed to each student present. Once all surveys were distributed, the student researcher and faculty members excused themselves from the room. Students

were allotted the full break time, 15 minutes, for completion of the pre-survey. Students were asked to provide a four-digit code on the top of the pre-survey to reduce traceability of results back to the participant. Upon completion, students placed the completed and/or unanswered surveys in the designated manila envelope located at the front of the classroom. Once all surveys were completed and returned to the manila envelope, one voluntary participant sealed the envelope with a confidential label and delivered the sealed envelope to the student researcher. The sealed envelopes were stored in a locked filing cabinet in the office of Principal Investigator, Marie Wilk DNP, RN-BC, CRNI. Lecture recommenced and all students present received a mandatory 30-minute educational program entitled Safe Opioid Prescribing presented by the student researcher as part of NUR 620 class content. The post-survey was administered on Week 3, in the same manner as the pre-survey.

Measurement

The Knowledge and Attitude Survey Regarding Pain by Farrell and McCaffery (2014) was used as the pre and post-survey for the study (Appendix C). The survey was originally established in 1987 as a pre- and post-survey to measure the attitudes and knowledge of nurses and other professionals regarding pain, and as a pre- and post-test evaluation for educational programs. The tool has been revised over the years to reflect changes in pain management practice. The survey consists of 22 True/False questions, 15 multiple-choice questions, and 2 case studies. Permission for the use of the survey was obtained from the authors Ferrell and McCaffery through a letter of approval retrieved from: www.prc.coh.org. Content validity has been established by review of pain experts (Ferrell and McCaffery). Reliability was established ($r > .80$) by repeat testing in a

continuing education class of staff nurses (N=60) and internal consistency reliability was established ($\alpha r > .70$) with items reflecting both knowledge and attitude domains (Ferrell & McCaffery, 2014). This tool has been used extensively from 1987-present. For the purpose of the study, the pre- and post-survey consisted of the 15 multiple-choice questions from the Knowledge and Attitudes Survey Regarding Pain.

Organizational Factors

The study is conducted in conjunction with Principal Investigator and Graduate Faculty, Marie Wilks DNP, RN-BC, CRNI. The educational program entitled Safe Opioid Prescribing was supported by Debra Servello, DNP, APRN-ACNP-BC, Graduate Faculty.

Student familiarity with safe opioid prescribing guidelines will promote safer prescribing practices and ultimately enhance patient care. Information on safe opioid prescribing guidelines has not been included in the course curriculum of Nursing 620-Adult Health/Illness III in the past.

Ethical Considerations

Upon submission to the RIC IRB in the Spring Semester of 2017, the student researcher identified the human subject risk as minimal, meaning there was no greater risk than that experienced in the participants' daily life. The RIC IRB was responsible for protecting participants in the study, and the student researcher was held responsible for protecting the rights and safety of people who participated in the study.

The risk to student participants was pressure to participate. Student lack of participation or opt-out was not held against them and/or did not reflect upon their status in the Graduate Nursing Program at RIC. The contact information for the IRB and IRB

director, along with information to The RIC Counseling Center for self-referrals was provided to any student in need (Appendix A- Informed Consent Letter).

The student researcher was a peer to the participants, meaning the student researcher was in the same graduating class as the participants and enrolled in Nursing 620 Course Spring, 2017. The student researcher stayed free of personal judgement during the entirety of this study. Participation in the study remained solely voluntary; no compensation for participation was offered. The student researcher did not discuss data collection results or data collection procedures with students.

Anticipated Timeline; Institutional Review Board (IRB)

The topic for this study was approved by RIC graduate faculty in Nursing 509-summer semester of 2016. Graduate Faculty, Debra Servello, DNP, APRN-ACNP-BC granted this student permission to obtain lecture time in Nursing 620- Adult/Older Adult Health/Illness III, Spring Semester of 2017 to conduct a required 30-minute educational program entitled Safe Opioid Prescribing. The proposal was submitted and accepted by the RIC IRB in the spring of 2017. Upon RIC IRB approval the pre and post-survey was initiated. The study was carried out over a three-week timeframe.

Data Analysis

The qualitative analysis utilized mean, median and mode. The results of the pre- and post-survey are reported as aggregate data, as well as, individual data. The results of the study will be presented at the Masters Symposium on May 2, 2017.

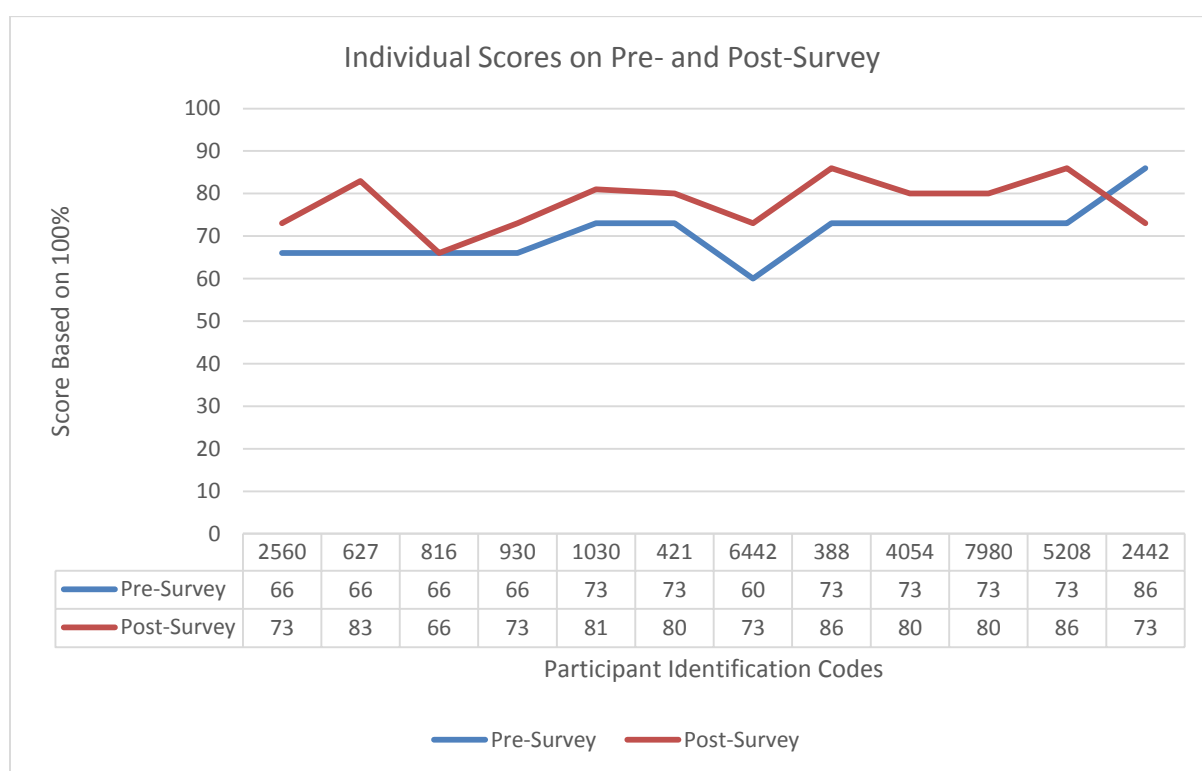
In the next section, the results will be discussed.

Results

Twelve surveys were utilized for data collection (n=12) attributable to inability to link identifiers on the pre- and post-survey. Individual scores on the pre- and post-survey were analyzed, utilizing mean, median, mode and difference. Below, Figure 1 illustrates the scores for the pre- and post-survey

Figure 1.

Individual Scores on Pre- and Post-Survey

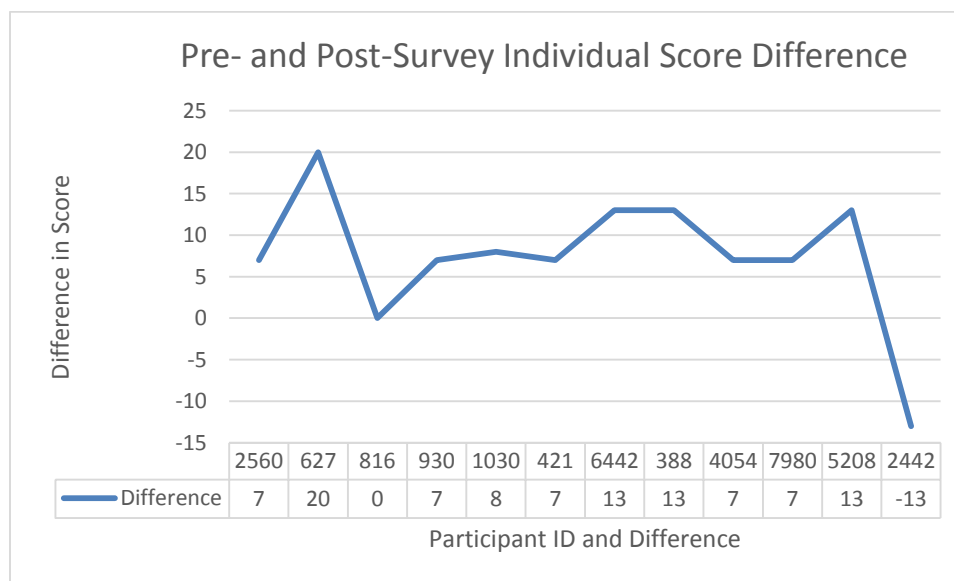


Pre-survey scores ranged from 60 to 86 out of 100, and post-survey scores ranged from 66 to 86 out of 100. Ten out of 12 participant scores improved from the pre- to post-survey. One participant had no change in score, and one participant showed a decline in score.

Below, Figure 2 illustrates pre- and post-survey individual score difference.

Figure 2.

Pre- and Post-Survey Individual Score Difference (n=12)



The pre- and post-survey individual score difference ranged from -13 to 20. One participant had no increase in score and one participant score decreased by -13 points. The highest increase in score was +20 points from the pre- to post-survey. On average, scores increased by +7 points from the pre- to post-survey, signifying an increase in knowledge and attitudes on pain in participating APRN students.

Table 2 illustrates the calculated mean, median and mode of the pre-survey, post-survey, and difference. Pre-survey results showed a mean score of 71, median of 73 and mode of 73, and post-survey results showed a mean score of 78, median of 80 and mode of 73. The difference score remained consistent with a mean, median and mode of 7.

Table 2.

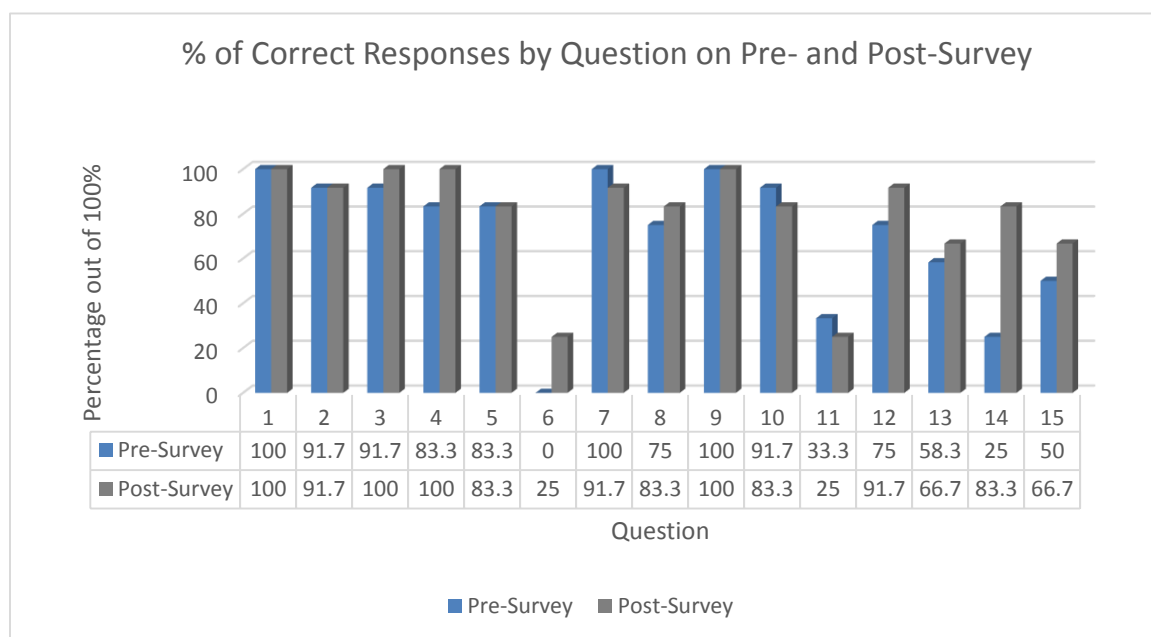
Mean, Median and Mode of Pre and Post-Survey Scores, and Difference.

All Participants:	Pre-Survey	Post-Survey	Difference
Mean	71	78	7
Median	73	80	7
Mode	73	73	7

Figure 3 shows the percentage of participants who answered each question correctly on the pre and post-survey.

Figure 3.

Knowledge and Attitudes Survey Regarding Pain



The percentage of correct responses ranged from 0%-100% on the pre-survey, and 25% to 100% on the post-survey. Nine questions showed an increase in score from the

pre- to post-survey, with the remainder showing no change in score (n=4), or a decline in score (n=2).

Poorest performances (less than 40% accuracy), on the pre-survey were observed on questions addressing the following: the likelihood of a patient with an alcohol and/or drug abuse disorder developing persistent pain (question 11), and identification of symptoms associated with opioid withdrawal upon abrupt discontinuation of an opioid in a physically dependent patient (question 14).

Poorest performances (less than 40% accuracy), on the post-survey were observed on questions pertaining to risk factors associated with opioid-induced respiratory depression (question 6), and the likelihood of a patient with a past history of opioid or substance-use disorder developing a chronic pain syndrome (question 11). Question 6 was answered incorrectly by all participating APRN students on the pre-survey, and only three (25%) of APRN students answered the question correctly on the post-survey.

Four out of the 15 questions showed no change in score from the pre- to post-survey (questions: 1, 2, 5 and 9), all with greater than 80% accuracy. These questions pertained to identification of the recommended route of administration of opioid analgesics in cancer-related pain (question 1) identification of the recommended route of administration of opioid analgesics in post-operative pain (question 2), knowledge of time-frame in which analgesics should be administered for post-operative pain (question 5), and determining who the most accurate judge of the intensity of a patients' pain is (question 9).

On the post-test, 9 out of the 15 questions showed an increase in score (questions: 3, 4, 6, 8, 10, 12, 13, 14 and 15). Four out of the 15 questions were answered correctly by

100% of participating APRN students on the post-survey (questions: 1, 3, 4 and 9). On a question pertaining to the APRN students' ability to identify the manifesting symptoms of physical dependence upon abrupt discontinuation of an opioid analgesic (question 14) there was a significant increase in score on the post-survey (83.3%), compared to the pre-survey (25%). Two questions decreased in score on the post-survey (questions: 7 and 11). These questions required APRN students to identify the most likely reason a patient with pain would request increases doses of pain medication (question 7), and the likelihood that patients who develop pain already have an alcohol and/or drug abuse problem (question 11), scores decreased by 8.3%.

The mean percent correct by question was 70.5% on the pre-survey and 78.8% on the post-survey, reflecting an average increase in scores by 8.3% after the mandatory educational program on Safe Opioid Prescribing for APRN Students. The mean percent correct by question on the pre and post-survey is analyzed below in Table 3.

Table 3.

Mean percent correct by question on pre- and post-survey

All Participants	Pre-Survey	Post-Survey
Mean	70.5%	78.8%

Next, Summary and Conclusions will be discussed.

Summary and Conclusions

The experience of pain is subjective and may vary from one person to the next. Pain affects all individuals and is associated with a wide range of diseases. The management of pain becomes a challenge when opioids are used. The United States (US) spent approximately \$193 billion dollars on drug abuse, in 2007 (Office of National Drug Control Policy, 2011). Hospitalizations related to opioid-use disorders cost the US an estimated \$14.85 billion dollars in 2012 (Ronan & Herzig, 2016). Drug addiction, abuse, and dependence is a major concern for clinicians managing pain conditions. Portal, Healy, Satz and McNamara (2015) concluded that initiation of prescribing guidelines in emergency rooms decreases the amount of opioids and scheduled II medications prescribed for acute pain management. A review of literature revealed that physicians, physician assistants and advanced practice nurses, receive inadequate training in pain management and safe prescribing guidelines, underscoring the importance of further education.

The purpose of this study was to increase awareness and knowledge of safe opioid prescribing guidelines among advanced practice nursing students. The study took place at RIC. APRN students enrolled in NURS 620 Adult Health/Illness III received education pertaining to Safe Opioid Prescribing. APRN students' knowledge and attitudes on pain was assessed by comparing responses on a post-survey to responses on a pre-survey administered prior to the program.

Results of the study demonstrate that an educational program on safe opioid prescribing increases APRN students understanding of pain. The mean improvement in score on the post-survey by +7/100 points demonstrates the benefit of educating APRN students on safe opioid prescribing.

There were several limitations identified in this study. First, the sample size was limited (n=12) due to time constraints and irrelevance of course content in lower level graduate courses. Second, course content on the week of the pre-survey included a lecture on Palliative Care, potentially impacting APRN students' knowledge on topics pertaining to addiction, dependence and pharmacological management of pain conditions prior to participation. Third, a previously scheduled course examination prior to the post-survey was required of all students, possibly leading to mental fatigue when completing surveys. Finally, the survey used for the project was adapted from the original (Ferrell & McCaffery, 2014), potentially affecting tool reliability. Lastly, APRN student's practice background and exposure to the use of narcotics for pain management may have negatively affected the results of this study.

The findings of this study are consistent with findings from a recent study by Hooten and Bruce (2010) which also demonstrated the importance of acknowledging educational gaps regarding the topic of pain. The study sample consisted of 128 healthcare providers; physicians, physician assistants, and advanced practice nurses. In this study over 50 percent of healthcare providers surveyed indicated that they were likely to prescribe opioids for chronic pain, and many had inaccurate beliefs and attitudes about medication abuse. Both studies highlight the need for, and the potential benefit of education for APRN students on safe opioid prescribing.

Next, Recommendations and Implications for Advanced Practice Nursing will be discussed.

Recommendations and Implications for Advanced Nursing Practice

The AACN (2016) indicates there are currently 204 nursing schools and 60 medical schools that have pledged to teach the CDC (2016b) Guidelines for Prescribing Opioids for Chronic Pain. Although this number is impressive, there are still many nursing and medical programs that have yet to conform to the change, including the RIC graduate nursing program. Academic nursing can help fight the opioid epidemic through proper education on national guidelines, emerging trends, and state and federal laws on prescribing opioids (AACN). All APRN students present for the mandatory educational lecture on Safe Opioid Prescribing stated to the student researcher that they had been unaware of the CDC (2016b) Guidelines for Prescribing Opioids for Chronic Pain, further underscoring the need for a curriculum change. Especially in light of this study's findings and a review of the relevant literature, the student researcher encourages the RIC graduate nursing program consider instituting a change in Nursing 620- Adult Health/Illness III curriculum to include lecture content on the CDC Guidelines for Prescribing Opioids for Chronic Pain. Incorporation of aspects of Kurt Lewin's Change Theory is recommended.

In order to promote a meaningful change in curriculum within the RIC graduate nursing program, Lewin's change theory provides a useful framework. Lewin's Change Theory (1997) recommends before implementing a change, driving forces, restraining forces and equilibrium are identified. The driving forces facilitate change by eliminating certain conflicts within a group. The main actions of a driving force are to change action by changing perceptions, and to move actions towards a positive change and away from a negative change. Restraining forces are thought to hinder change by attempting to push it

into the opposite direction. Equilibrium refers to the overlapping of two force fields. In the state of equilibrium, the driving forces are equal to the restraining forces, therefore, no change will be seen. Lewin (1997) recommends using three steps to develop and incorporate a change. These are: unfreezing, moving, and refreezing. Unfreezing allows individuals to adapt the new process while letting go of the old. Moving involves a desired effect to a new level, which involves changing the thoughts, feelings, and behavior of a group. Refreezing, occurs when a change is successfully maintained.

Identifying gaps in education regarding safe opioid prescribing and potential obstacles to change are important first steps. An important step to successfully implementing a curriculum change is achieving and maintaining support from RIC graduate nursing program faculty. APRNs provide care in a wide range of primary and specialized settings to individuals, families, groups and communities and may be first line responders to patients' complaints of pain, highlighting the importance of education (AACN, 2016). APRN must strive to provide care through evidence-based documentation, as well as serve as a resource for patients, families and communities. Ensuring that the APRN understands the significance of the current opioid epidemic, and are well-informed with regard to managing chronic conditions will ensure quality, evidence-based patient care.

The educational program development would be implemented in NURS 620 Adult Health/Illness III, focusing on senior semester APRN graduate students, at RIC. The program would highlight the 12- CDC (2016b) Guidelines for Prescribing Opioids for Chronic Pain, pharmacological and non-pharmacological management of a wide variety of pain conditions, identification and differentiation of drug abuse, addiction,

dependence, and tolerance, management and treatment of opioid-use disorders, and a review on risk factors associated with the development of opioid-use disorders.

Highlighting and incorporating statistics and facts on the national opioid epidemic in the beginning of the educational program development will help address the learners need to know, as described by Knowles et al., (2015). The use of student evaluations is recommended in order to continually review students' needs and expectations. Adapting lecture content based on new research pertaining to safe opioid prescribing is imperative in preparing APRN students to practice with self-assurance and effectiveness.

Although a relatively small study, gaps in education among APRN students on safe opioid prescribing and management of pain conditions were identified. Prior to implementation and development of a curriculum change in RIC graduate nursing program, a larger sample study is recommended.

References

- American Association of College of Nursing. (2016) Understanding the opioid epidemic: the academic nursing perspective. Retrieved from:
<http://www.aacn.nche.edu/government-affairs/ian/2016/June-2016.pdf>
- American Society of Addiction Medicine. (2011). Public policy statement- definition of addiction. Retrieved from: http://www.asam.org/docs/default-source/public-policy-statements/1definition_of_addiction_long_4-11.pdf
- Bao, Y., Pan, Y., Taylor, A., Radakrishnan, S., Luo, F., Pincus, H. A., & Schackman, B. R. (2016). Prescription drug monitoring programs are associated with sustained reductions in opioid prescribing by physicians. *Health Affairs*, 35(6), 1045-1051.
- Bureau of Labor Statistics. (2017). Occupational employment statistics. Retrieved from: <https://www.bls.gov/oes/current/oes291171.htm#st>
- Centers for Disease Control and Prevention (2011). Vital Signs: Prescription painkiller overdoses in the US. Retrieved from <http://www.cdc.gov/vitalsigns>
- Centers for Disease Control and Prevention. (2012). CDC grand rounds: Prescription drug overdoses-A US epidemic. *MMWR. Morbidity and Mortality Weekly Report*, 61(1), 10.
- Centers for Disease Control and Prevention (2016a). Prescription drug monitoring programs (PDMPS). Retrieved from:
<http://www.cdc.gov/drugoverdose/pdmp/index.html>

Centers for Disease Control and Prevention. (2016b). Guideline for prescribing opioids for chronic pain. *Journal of Pain & Palliative Care Pharmacotherapy*, 30(2), 138-140.

Davis, C. S., & Carr, D. (2016). Physician continuing education to reduce opioid misuse, abuse, and overdose: Many opportunities, few requirements. *Drug and alcohol dependence*, 163, 100-107. Retrieved from:
https://www.researchgate.net/profile/Corey_Davis3/publication/301759691_Physician_continuing_education_to_reduce_opioid_misuse_abuse_and_overdose_Many_opportunities_few_requirements/links/572a16e808aef5d48d30c483.pdf

Ferrell, B., McCaffery M. (2014) Knowledge and attitudes survey regarding pain
Retrieved from: <http://prc.coh.org>

Gerhardt, A. M. (2004). Identifying the drug seeker: The advanced practice nurse's role in managing prescription drug abuse. *Journal of the American Academy of Nurse Practitioners*, 16(6), 239-243.

Hooten, W. M., & Bruce, B. K. (2010). Beliefs and attitudes about prescribing opioids among healthcare providers seeking continuing medical education. *Journal of opioid management*, 7(6), 417-424.

Knowles, M., Holton III, E., & Swanson, R. (2015). The adult learner the definitive classic in adult education and human resource development (8th ed.). New York, NY: Routledge

Lewin, K. (1997). Resolving social conflicts and field theory in social science. G. W.

Lewin (Ed). [Kindle DX version]. Retrieved from Amazon.com

Ling, W., Mooney, L., & Hillhouse, M. (2011). Prescription opioid abuse, pain and addiction: Clinical issues and implications. *Drug and Alcohol Review, 30*(3), 300-305.

Longo, L. P., Parran Jr, T., Johnson, B., & Kinsey, W. (2000). Addiction: Part II. Identification and management of the drug-seeking patient. *American Family Physician, 61*(8), 2401- 2408.

Meyer, R., Patel, A. M., Rattana, S. K., Quock, T. P., & Mody, S. H. (2014). Prescription opioid abuse: A literature review of the clinical and economic burden in the United States. *Population Health Management, 17*(6), 372-387.

National Institute on Drug Abuse. (2012a). Principals of drug addiction treatment: a research-based guide (3rd ed.). NIH Publication. Retrieved from:
https://www.drugabuse.gov/sites/default/files/podat_1.pdf

National Institute on Drug Abuse (2012b). DrugFacts: Understanding drug abuse and addiction. Retrieved from:
<https://drugabuse.gov/publications/drugfacts/understanding-drug-abuse-addiction>

National Institute on Drug Abuse. (2014). Media guide how to find what you need to know about drug abuse and addiction. Retrieved from:
https://www.drugabuse.gov/sites/default/files/mediaguide_web_3_0.pdf

National Institute on Drug Abuse (2015). Overdose death rates. Retrieved from:
<https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>

Office of Drug Control Policy. Executive Office of the President. (2011). How illicit drug use affects business and the economy. Retrieved from:

https://www.whitehouse.gov/sites/default/files/ondcp/Fact_Sheets/effects_of_drugs_on_economy_jw_5-24-11_0.pdf

Patrick, S. W., Fry, C. E., Jones, T. F., & Buntin, M. B. (2016). Implementation of prescription drug monitoring programs associated with reductions in opioid-related death rates. *Health Affairs*, *35*(7), 1324-1332.

Paulozzi, L. J. (2012). Prescription drug overdoses: A review. *Journal of Safety Research*, *43*(4), 283-289.

Paulozzi, L. J., Kilbourne, E. M., & Desai, H. A. (2011). Prescription drug monitoring programs and death rates from drug overdose. *Pain Medicine*, *12*(5), 747-754.

Pohl, M., & Smith, L. (2012). Chronic pain and addiction: challenging co-occurring disorders. *Journal of Psychoactive Drugs*, *44*(2), 119-124.

Portal, A., Healy, M. E., Satz, W. A., & McNamara, R. M. (2016). Impact of an opioid prescribing guideline in the acute care setting. *The Journal of Emergency Medicine*, *50*(1), 21-27.

Raimondo, G. (2016) Governor's overdose prevention and intervention task force. Retrieved from <http://www.governor.ri.gov/documents/press/051116.pdf>

Ray, W. A., Chung, C. P., Murray, K. T., Hall, K., & Stein, C. M. (2016). Prescription of long-acting opioids and mortality in patients with chronic non-cancer pain. *JAMA*, *315*(22), 2415-2423.

Rhode Island Department of Health (2015). Prescription drug monitoring program enforcement act. Retrieved from <https://s3.amazonaws.com/enp-network-assets/production/attachments/63171/original/2015PrescriptionDrugMonitoringProgramEnforcementPlan.pdf?2015>

Rhode Island Department of Health (2016). Drug overdose deaths. Retrieved from: <https://s3.amazonaws.com/enpnetworkassets/production/attachments/63171/original/205PrescriptionDrugMonitoringProgramEnforcementPlan.pdf?2015>

Riley, S. (2003). Easing the pain: nurse practitioners and pain management. *The Oklahoma Nurse*, 49(4), 24-26.

Ronan, M. V., & Herzig, S. J. (2016). Hospitalizations related to opioid abuse/dependence and associated serious infections increased sharply, 2002–12. *Health Affairs*, 35(5), 832-837.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2015). Behavioral health barometer Rhode Island, 2014. Retrieved from: <http://store.samhsa.gov/shin/content//SMA15-4895/BHBBarometer-RI.pdf>

Stempniak, M. (2016). Our Opioid Nightmare. *Trustee: the journal for hospital governing boards*, 69(3), 13.

Appendix A

Informed Consent Letter

Rhode Island College

Safe Opioid Prescribing Guidelines for APRN Students

You are being asked to participate in a master's major project study on "Safe Opioid Prescribing Guidelines for APRN Students". You are being asked to participate in this study because you are a Nurse Practitioner or Clinical Nurse Specialist Student in the Course of Nursing 620- Adult Health III, Spring Semester 2017 at Rhode Island College. We would like to gather information on APRN students' knowledge and attitude regarding pain. The student researcher is conducting this research project in conjunction with Principal Investigator, Marie Wilks, DNP, RN-BC, CRNI. Ashley L. Chartier BSN, RN, OCN a student in the Master's program at Rhode Island College, is responsible for conducting this study.

Why this Study is Being Done (Purpose)

The opioid epidemic is on the rise, changes in prescribing practices are essential to prevent addiction, abuse and overdose. It is essential to better patient outcomes that clinicians undergo continuing education on the topic of pain management and safe prescribing. The purpose of this project is to increase advanced practice nursing students' awareness, knowledge and attitudes on pain and current guidelines for safe opioid prescribing.

What You Will Have to Do (Procedures)

If you choose to be in the study, you will be asked to:

- Complete a voluntary pre- and post-survey, that consists of 15 multiple choice questions on your Knowledge and Attitudes Regarding Pain. The survey will take place during your schedule break time during Nursing 620 and is estimated to not exceed 15 minutes.
- Lecture content entitled Safe Opioid Prescribing will follow the pre-survey, as part of your lecture requirements in Nursing 620.
- You will be asked to identify a four-digit code of your choice on the pre- and post-survey. You will use the same four-digit code on the pre- and post-survey to protect your anonymity.
- The post-survey will be conducted one week after the lecture content.

Compensation

There will be no financial compensation for this project.

Risks or Discomforts

Due to personal experiences you may find some questions as upsetting. You can skip any questions you do not want to answer or withdraw from the survey at any time. If you want to talk to someone about your feelings or about problems that you're having, you

can call The Counseling Center at Rhode Island College by telephone at 401-456-8094. You will be held responsible for any fees for services. We will not pay any fee.

Benefits of Being in the Study

Being in this study will not benefit you directly.

Deciding Whether to Be in the Study

Being in the study is your choice to make. Nobody can force you to be in the study. You can choose not to be in the study, or opt out at any time. All content covered in the educational program can be covered on course exams by discretion of instructor. The research portion of this project is limited to the pre- and post-survey only. The educational program is part of the required course content for Nursing 620 and attendance is mandatory as per the course syllabus.

How Your Information will be Protected

Because this is a research study, results will be summarized across all participants and shared in MSN documents and Masters presentations. Proper steps will be taken to protect the information you provide as well as maintain your anonymity. The information will be kept in a locked office file by the PI, and seen only by myself and other researchers described in the project. In addition, Rhode Island College institutional review board is responsible for protecting participants in this study. The student researcher is held responsible for protecting the rights and safety of people who participate in this research study. The information will be kept for three years following the completion of the study, including any publications that may result. After three years the data will be shredded.

Who to Contact

You can ask any questions you have now. If you have any questions later, you can contact myself, Ashley Chartier, BSN, RN, OCN at Anelsen_5693@email.ric.edu or by telephone at (401) 864-7719. You can also contact Principal Investigator, Marie Wilks, DNP, RN-BC, CRNI at mwilks@email.ric.edu or by phone (401) 456-6362 If you have any concerns or would like to address any issues regarding this project, have complaints, or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Dr. Cindy Padula at IRB@ric.edu, by phone at 401-456-9720.

Please retain this consent for further reference.

Statement of Consent

I have read and understand the information above. I am choosing to be in the study "Safe Prescribing of Opioid Guidelines for APRN Students". My participation in completing the survey is my acknowledged consent. I may elect to voluntarily remove myself from the pre- or post-survey by not completing the form. I have been given answers to the questions I asked, or I can contact the researcher with any questions at a later date.

Name of Researcher Obtaining Consent: Ashley L. Chartier BSN, RN, OCN

Appendix B

Letter of Approval – Knowledge and Attitude Survey Regarding Pain

July 2014

The “Knowledge and Attitudes Survey Regarding Pain” tool can be used to assess nurses and other professionals in your setting and as a pre and post-test evaluation measure for educational programs. The tool was developed in 1987 and has been used extensively from 1987 - present. The tool has been revised over the years to reflect changes in pain management practice.

Regarding issues of reliability and validity: This tool has been developed over several years. Content validity has been established by review of pain experts. The content of the tool is derived from current standards of pain management such as the American Pain Society, the World Health Organization, and the National Comprehensive Cancer Network. Construct validity has been established by comparing scores of nurses at various levels of expertise such as students, new graduates, oncology nurses, graduate students, and senior pain experts. The tool was identified as discriminating between levels of expertise. Test-retest reliability was established ($r > .80$) by repeat testing in a continuing education class of staff nurses ($N=60$). Internal consistency reliability was established ($\alpha r > .70$) with items reflecting both knowledge and attitude domains.

Regarding analysis of data: We have found that it is most helpful to avoid distinguishing items as measuring either knowledge or attitudes. Many items such as one measuring the incidence of addiction really measures both knowledge of addiction. and attitude about addiction. Therefore, we have found the most benefit to be gained from analyzing the

data in terms of the percentage of complete scores as well as in analyzing individual items. For example, we have found it very helpful to isolate those items with the least number of correct responses and those items with the best scores to guide your educational needs.

Enclosed for your use is a copy of our instrument and an answer key. You may use and duplicate the tool for any purpose you desire in whole or in part. References to some of our studies which have included this tool or similar versions are included below. We have received hundreds of requests for the tool and additional use of the tool can be found in other published literature. We also acknowledge the assistance of several of our pain colleagues including Judy Paice, Chris Pasero, and Nessa Coyle in the revisions over the years. If using or publishing the tool results please cite the reference as “Knowledge and Attitudes Survey Regarding Pain” developed by Betty Ferrell, RN, PhD, FAAN and Margo McCaffery, RN, MS, FAAN, (<http://prc.coh.org>), revised 2014.

We hope that our tool will be a useful aid in your efforts to improve pain management in your setting.

Sincerely,

Betty R. Ferrell, RN, PhD, FAAN & Margo McCaffery, RN, MS, FAAN Research

Scientist Lecturer and Consultant

Appendix C

Four Digit Code _____

Pre-Survey / Post-Survey (Circle one)

Knowledge and Attitudes Survey Regarding Pain

Multiple Choice –Please circle the correct answer. If you chose to not answer a specific question, please leave that questions blank.

1. The recommended route of administration of opioid analgesics for a patient with persistent cancer-related pain is
A. intravenous B. intramuscular C. subcutaneous D. oral E. rectal
2. The recommended route administration of opioid analgesics for a patient with brief, severe pain of sudden onset, such as trauma or postoperative pain is
A. intravenous B. intramuscular C. subcutaneous D. oral E. rectal
3. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?
A. codeine B. morphine C. meperidine D. tramadol
4. A 30 mg dose of oral morphine is approximately equivalent to:
A. Morphine 5 mg IV B. Morphine 10 mg IV C. Morphine 30 mg IV
D. Morphine 60 mg IV
5. Analgesics for post-operative pain should initially be given
A. around the clock on a fixed schedule B. only when the patient asks for the medication. C. only when the nurse determines that the patient has moderate or greater discomfort

6. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is

- A. less than 1% B. 1-10% C. 11-20% D. 21-40% E. > 41%

7. The most likely reason a patient with pain would request increased doses of pain medication is:

- A. The patient is experiencing increased pain. B. The patient is experiencing increased anxiety or depression. C. The patient is requesting more staff attention. D. The requests of the patient are related to addiction.

8. Which of the following is useful for treatment of cancer pain?

- A. Ibuprofen (Motrin) B. Hydromorphone (Dilaudid) C. Gabapentin (Neurontin)
D. All of the above

9. The most accurate judge of the intensity of a patient pain is:

- A. The treating physician B. The primary nurse for the patient C. The patient
D. The pharmacist E. The spouse or family of the patient

10. Which of the following describes the best approach for cultural considerations in caring for a patient in pain:

- A. There are no longer cultural influences in the U.S. due to the diversity of the population.
B. Cultural influences can be determined by the ethnicity of an individual (e.g., Asians are stoic, Italians are expressive, etc.).

- C. The patient should be individually assessed to determine cultural influences.
- D. Cultural influences can be determined by the socioeconomic status of an individual (e.g., blue collar workers report more pain than white-collar workers can).
11. How likely is it that a patient who develop pain already had an alcohol or drug abuse problem?
- A. < 1% B. 5 – 15% C. 25 - 50% D. 75 - 100%
12. The time to peak effect for morphine given IV is
- A. 15 min. B. 45 min. C. 1 hour D. 2 hours
13. The time to peak effect for morphine given orally is
- A. 5 min B. 30 min C. 1 – 2 hours D. 3 hours
14. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:
- A. sweating, yawning, diarrhea and agitation when the opioid is abruptly discontinued in a patient. B Impaired control over drug use, compulsive use, and craving. C. The need for higher doses to achieve the same effect. D. Both A and B
15. Which statement is true regarding opioid induced respiratory depression:
- A. More common several nights after surgery due to accumulation of opioid. B. Obstructive sleep apnea is an important risk factor. C. Occurs more frequently in those already on higher doses of opioids before surgery. D. Can be easily assessed using intermittent pulse oximetry.

Reference

Ferrell, B., McCaffery M. (2014). Knowledge and attitudes survey regarding pain.

Retrieved from: <http://prc.coh.org>

