4-24-2017

Proper Prescribing of Controlled Drugs: A Pilot Study of a Web-based Learning Modules' Impact on Knowledge, Attitude, and Practice in New Graduate Nurse Practitioners

Shelly Duckett
Belmont University

Proper Prescribing of Controlled Drugs: A pilot study of a web-based learning modules' impact on knowledge, attitude, and practice in new graduate nurse practitioners

Shelby Duckett

Belmont University

Scholarly Project Advisor: Dr. Elizabeth Morse

Scholarly Project Team Members: Dr. Joseph M. Price Dr. Charlene Dewey, Bill Swiggart, and Dr. Sandra Murabito

Date of Submission: April 24, 2017

Table of Contents

Abstract

Controlled substance abuse is a global epidemic. Several factors that influence health care providers prescribing habits have been presented in recent literature. However, the existing evidence primarily reflects the prescribing habits of physicians, while relatively little is known about the prescribing habits of nurse practitioners. The purpose of this project is to evaluate the impact of a brief web-based continuing education module targeting appropriate prescribing of controlled substances for recent graduate nurse practitioners. The project served to assess the provider's knowledge, attitude, and practice compared to current integrated curriculum on prescribing and assess change in knowledge. Two online educational modules and associated Pre and Post-Test knowledge assessments, Demographics survey, and Course Evaluation survey were conducted on a total of 22 new graduate nurse practitioners from Belmont University's family nurse practitioner program. Results were obtained, analyzed, and coded using Qualtrics Survey Software, IMB SPSS Statistics Version 23 and by direct item analysis. The mean knowledge score of participants significantly increased after completing the online educational intervention. Most participants (63.6%) reported feeling adequately prepared by their graduate level pharmacology course to prescribe controlled substances, however, over three fourths of participants indicated they would "definitely" or "probably" make a practice related change. Knowledge deficits pertaining to the ability to classify pain, recognizing appropriate adjuvant therapies, utilizing systematic prescribing approaches, and the ability to assess, screen, and monitor for substance use disorder (SUD) were identified. Despite reports of feeling prepared to properly prescribe, knowledge deficits were identified in graduates who have only been exposed to information surrounding controlled substance prescribing found in current integrated curriculum. The online

educational intervention was found to successful in increasing participant knowledge after participation and was reported by respondents to be very practical and applicable to clinical practice.

Keywords: opioid analgesics, primary healthcare, providers, attitudes, dosing, guidelines, Tennessee, prescribing, pilot, nurse practitioner.

Introduction and Background

Controlled substance abuse has become a worldwide problem, in particular opioid abuse. In 2012 alone, health care providers wrote an estimated 250 million prescriptions for opioid pain medications, enough for every person aged 18 or greater in the United States to have a bottle of pills (Centers for Disease Control and Prevention, 2016). This is an increase of approximately 170 million prescriptions since 1991 (National institute on Drug Abuse, 2014). Since 1999, the number of unintentional overdose deaths from prescription opioids has more than quadrupled (National Institute on Drug Abuse, 2014). Due to this prescription increase, the potential for drug diversion is higher and there is increased risk of inappropriate use, and ultimately user death (Volko, 2015).

In 1997 the Tennessee Nurses Association (TNA) passed legislation authorizing nurse practitioners prescriptive authority of controlled drugs, Schedules II-V (Tennessee Nurses Association, n.d.b). Since the passing of this bill, the Tennessee Controlled Substance Monitoring Database (TNCSMD) identified that 35 of the top 50 prescribers of controlled substances were Advanced Practice Registered Nurses (APRNs), including nurse practitioners (Tennessee Nurses Association, n.d.a).

The American Association of Nurse Practitioners (2017) reports nurse practitioners write approximately 23 prescriptions a day and 7,500 prescriptions within a given calendar year. Between the years 2014 and 2015 an estimated 20,000 new nurse practitioners successfully graduated from academic programs with the intention of passing certification exams and entering the workforce (American Association of Nurse Practitioners, 2017). With 83.4% of nurse practitioners being certified in an area of primary care and over 50% of opioid prescriptions originating in the primary care setting,

assessment of the prescribing practices of new nurse practitioners may contribute to a clearer understanding of how this population of prescribers is contributing to the epidemic (American Association of Nurse Practitioners, 2017; Hudspeth, 2016). Additionally, a clearer understanding of the clinical context in which prescriptions are written, as well as the education and training that prepares nurse practitioners as prescribers may illuminate how APRN prescribers may be vulnerable to misprescribing.

Misprescribing may be purposeful or accidental and occur for a multitude of reasons. Prescribers can be classified as dishonest are seeking personal financial gain. Others may be classified dated in their knowledge, duped by drug-seeking patients, dysfunctional due to overextension, or have disregard or disbelief for prescribing guidelines, all leading to inappropriate prescribing of controlled substances (Spickard, Dodd, Swiggart, Dixon, Pichert, 1998).

In early 2016, the CDC released standardized opioid prescribing guidelines to support safe and responsible prescribing practices. Healthcare provider's personal attitudes and beliefs, legal and practice considerations, and concern over Federal Drug Agency (FDA) and Drug Enforcement Agency (DEA) scrutiny have significantly impacted their opioid prescribing habits (Chiauzzi, Trudeau, Zacharoff & Bond, 2011; Fontana, 2008; Hooten & Bruce, 2011; Spitz, Moore, Papaleontiou, Granieri, Turner, & Reid, 2011). However, the body of literature surrounding this topic focuses primarily on the prescribing habits of medical doctors, while relatively little is known about whether these variables have a similar impact on the prescribing practices of nurse practitioners. With approximately 222,000 licensed nurse practitioners in active practice with prescriptive authority for controlled substances in all 50 states, it is imperative to consider

and assess factors that are unique to this population of prescribers (Department for Professional Employees, 2016; American Association of Nurse Practitioners, 2017).

However, several continuing education methods were successful in furthering prescriber knowledge and improving attitudes surrounding controlled substances (McCracken, Biochat, &Eccleston, 2012; Roth& Burgess, 2008; Srivastava, Kahan, & Jiwa, 2012)

The Center for Professional Health (2016) (CPH) at Vanderbilt University in Nashville, Tennessee was established in 1998 to help physicians who needed behavioral intervention and remediation related to their own substance abuse or the inappropriate prescribing of controlled substances and to provide the Tennessee Board of Medical Examiners with new options for physician remediation (Bill Swiggart, personal communication, February 11, 2016). In the eighteen years since, CPH has served more than 1,150 physicians from all over the United States and has developed a body of research on the complexity of responsible prescribing, the psychological roots of inappropriate prescribing and the unique challenges of clinicians who suffer from substance abuse disorder (SUD). After years of research the Center for Professional Health (2016) discovered the reasons for misprescribing were multi-factorial and were able to group misprescribers into categories based on the reason for misprescribing. Thus, remediation and intervention required deep introspection, reflection, SUD treatment where necessary, and ongoing counseling and support.

Problem Statement

Despite increased regulation and guidance, nurse practitioners continue to be among the top prescribers of controlled substances. To ensure our professional

responsibility related to prescribing, it is imperative to assess the factors that influence this unique population of controlled substance prescribers.

Purpose

The purpose of this scholarly project is to evaluate the efficacy of The Center for Professional Health's continuing education modules on appropriate prescribing of controlled substances for recent graduate nurse practitioners and assess the provider's knowledge, attitude, and practice compared to current integrated curriculum on prescribing. The objective of this study is to determine if pre and post-tests reveal an increase in the provider's knowledge, a change in attitude toward prescribing controlled substances, and reveal any intended change in practice after reviewing the educational modules. Additionally, this project is piloting the web based modules as an appropriate and desirable format for targeting new providers within the first five years of practice to increase knowledge surrounding controlled substance prescribing.

Review of Evidence

Guidelines

In early 2016 the CDC published *The CDC Guideline for Prescribing Opioids for Chronic Pain* to provide health care providers with evidence-based recommendations for the prescribing of pain medications for persons aged 18 years or greater in the primary health care setting (CDC, 2016). The guidelines focus on the use of opioid analgesics in the treatment of chronic, non-cancer, non-palliative care pain. The guidelines consists of 12 recommendations, each with an evidence-based rational. The CDC (2016) reports the recommendations were formed by systematic review of scientific evidence, while still

allowing consideration for the associated benefits and harms, values and preferences, and resource allocation.

The Tennessee Department of Mental Health and Substance Abuse Services (2014) has employed a statewide opioid prescribing guideline as well as strategies to prevent and treat prescription drug abuse in the state. However, persistent prescribing, diversion and accidental overdose in both the state and nation suggests awareness and application of guidelines alone is not sufficient to change providers' prescribing habits.

Factors Influencing Prescriber Habits

Several articles presented factors that influence prescribers, including knowledge, personal attitude and beliefs, legal and practice considerations, and concerns of DEA and FDA scrutiny (Chiauzzi, Trudeau, Zacharoff & Bond, 2011; Fontana, 2008; Hooten & Bruce, 2011; Spitz, Moore, Papaleontiou, Granieri, Turner, & Reid, 2011).

Knowledge. Chiauzzi, Trudeau, Zacharoff and Bond (2011) consulted sixteen nationally recognized experts in primary care, pain management, and addiction medicine and identified knowledge, skills, and competencies most influential and critical for primary care providers to effectively manage patients taking opioid analgesics. General knowledge surrounding monitoring urine drug screens was the single most important skill needed to properly treat and manage patients taking controlled substances. Knowledge pertaining to assessment of risky behavior in patients ranked second and interpersonal skills was third.

Fontana (2008) found that APRN's prescriptive choices were influenced in part by knowledge of the etiology of the pain. Participants reported this knowledge was obtained from their formal education and hands on clinical experience. However,

participants also reported feeling as though integrated curriculum on pain management and pharmacology pertaining to controlled substances was not adequate in comparison to the volume of patients seen for pain related complaints (Fontana, 2008). Hooten and Bruce's (2011) survey participants also reported the lack of formal education on the topic manifested itself in feelings of fear related to causing addiction in patients.

Spitze, Moore, Papaleontiou, Granieri, Turner, and Reid (2011) found that prescribers consider numerous patient factors when deciding to prescribe an opioid, including the provider's subjective experience of patient reliability, presence of a reliable caregiver, etiology of the pain, and a documented history of benefiting from opioid therapy. Providers were more likely to prescribe opioid therapy if the patient was reliable or had a reliable caregiver to administer the medication, an identifiable etiology of pain, and a history of successful opioid therapy. Likewise, Spitze, Moore, Papaleontiou, Granieri, Turner, and Reid (2011) found providers were less likely to prescribe an opioid if the patient had cognitive impairment, history of polypharmacy, or no reliable caregiver.

Personal attitudes & beliefs. The focus group of nurse practitioners in Fontana's (2008) study reported reluctance to prescribe certain medications if they or a family member had a negative experience with the specific drug. In conjunction with Fontana (2008), Spitze, Moore, Papaleontiou, Granieri, Turner, and Reid (2011) also found if a practitioner had a prior clinical experience or personal experience with a painful condition, he/she was more likely to prescribe opioid analgesics to the patient. In addition, participants connected relying on their personal experience with a general lack of formal education pertaining to controlled substance prescribing (Fontana, 2008). All

participants reported believing better formal education in pain management would help them better meet the needs of their patients (Fontana, 2008).

Spitze, Moore, Papaleontiou, Granieri, Turner, and Reid (2011) conducted a focus group composed of 23 physicians and three nurse practitioners that revealed all providers reported feeling cautious and uneasy when prescribing controlled substances.

Hooten and Bruce (2011) distributed a questionnaire to 128 medical doctors and APRN's and found that 27% of respondents believed that prescribing opioids could lead to abusive behavior, patient addiction, and have an unfavorable impact on their clinical practice. Overall Hooten and Bruce (2011) found that a large proportion of respondents reported a negative attitude toward patients with abusive behavior and addiction, as well as a negative attitude toward the effects of prescribing opioids on the complexity of patient care. Prescribers reported that adding opioid therapy would increase the level of management related to polypharmacy, the management of comorbid conditions, and result in the need to obtain a more complex patient history.

Legal & practice considerations. Fontana (2008) revealed that many participants felt constrained by their clinical practice setting and felt it necessary to protect one's self from the perceived personal risk involved with prescribing opioids. This protection involved each practitioner assessing his/her own best interest, in relation to his/her role within the clinical practice. Within certain practice settings practitioners must adhere to protocols that do not allow for the personal consideration of practitioner (Fontana, 2008).

DEA & FDA scrutiny. Fontana (2008) critically examined subjective factors that influence the prescribing habits of APRN's, finding that clinicians often act in their own best interest to reduce the risk of DEA scrutiny. Participants reported fear of DEA

scrutiny even in situations where the pharmacologic choice was appropriate (Fontana, 2008). Hooten and Bruce (2011) and Spitze, Moore, Papaleontiou, Granieri, Turner, and Reid (2011) also found that respondents are concerned about regulatory FDA scrutiny when prescribing controlled substances.

Tennessee Requirements & Curriculum Audit

In order to obtain prescriptive authority in Tennessee, the state Board of Nursing requires a minimum of three quarter hours of graduate level pharmacology instruction in addition to a current unencumbered license as a registered nurse, a current national certification in the appropriate nursing specialty area, and graduation from a master's or doctoral level nursing program (Tennessee Code Ann. §63-7-207). In order to prescribe controlled substances, one must contact the Drug Enforcement Agency (DEA) and complete the designated application before being issued a DEA number. The Tennessee State Board of Nursing now requires two contact hours of continuing medical education (CME) addressing controlled substance prescribing specifically as a requisite for the renewal of the APRN license (Tennessee Code Ann. §1000-4-.05).

Nurse practitioners in Tennessee are required to renew certification every five years; during the first years of practice, new graduate nurse practitioners rely on information presented on controlled substances during the advanced pharmacology portion of his/her graduate education course (Tennessee Code Ann. §1000-4-.05). In Belmont University's family nurse practitioner program there is one pre-class, voice-over PowerPoint dedicated to the legal aspects of prescribing in Tennessee, one in-class PowerPoint specific to analgesics, and a review of the CRAFFT Substance Abuse Screen mnemonic tool. Within the analgesic PowerPoint, there are 16 slides specifically

dedicated to controlled substances. Formal instruction and practice related to screening for SUD in primary care is focused illicit drug and alcohol abuse and is not related to controlled substance prescribing or pain management.

While this curriculum meets the standards set forth by the Tennessee Code Ann. §63-7-207, whether this amount of information adequately prepares nurse practitioners to properly prescribed controlled substances is unknown. Full application of the skills surrounding controlled substance prescribing cannot be applied until the student has successfully graduated, received a DEA number, and is in active clinical practice; this process is on average one to two years after this information is initially presented in Belmont University Graduate School of Nursing's pharmacology course.

Educational Intervention

The need for continuing education and readily accessible guidelines is well established in the literature. As a result, researchers have been working to implement new interventions aimed to fill the identified gaps in knowledge and skills.

McCracken, Biochat, and Eccleston (2012) found that the demand for further opioid education including both pain pathology and prescribing practices is high. The authors also found that participants of the training intervention reported the Acceptance and Commitment Therapy (ACT)-based educational intervention was more interesting and engaging than the traditional standard education intervention. ACT training focuses primarily on psychological flexibility, which entails the ability to act in accordance with goals and values while minimizing influence from cognitive or emotional experiences (McCracken, Biochat, and Eccleston, 2012). This suggests that health care professionals prefer experiential exercises and the emotionally evocative methods of ACT to more

passive didactic learning activities. The authors also report that participants showed an increase in knowledge of controlled substance prescribing immediately post-intervention and two weeks later, as evidenced by post-test results. Participants also reported having an overall decrease of concern about addiction, professional scrutiny, and increased controlled substance prescribing knowledge (McCracken, Biochat, & Eccleston, 2012).

Roth and Burgess (2008) also found that after attending an educational workshop grounded in adult learning theory, participants reported significantly less fear of causing addiction in patients, and less concern for professional and legal scrutiny related to prescribing controlled substances.

Srivastava, Kahan, and Jiwa (2012) led a prospective cohort pilot study evaluating the feasibility and effectiveness of a multifaceted educational intervention to improve the opioid prescribing practices of physicians. Participants reported the didactic and case discussion facet to be most helpful and enjoyable, while the e-mail and online chat room were the least useful. Participants in this study reported increased application of treatment guidelines, including routing screening for misuse and abuse after the educational intervention.

Since CPH was formed over a decade ago, it has served over 1,150 providers, but primarily physicians (Brown, Swiggart, Dewey, & Ghulyan, 2012; Charlene Dewey, personal communication, February 11, 2016). Since 1997, when mid-level prescribers gained prescriptive authority of scheduled drugs, The Center for Professional Health saw an increase in the number of nurse practitioners and physician assistants attending the remediation course (Bill Swiggart, personal communication, February 11, 2016). The increase in nurse practitioner and physician assistant prescribers has lead The Center for

Professional Health at Vanderbilt University to create the *Proper Prescribing of Controlled Prescription Drugs for Advanced Practice Nurses* course aimed specifically at this population (Charlene Dewey, personal communication, February 11, 2016).

Theoretical Model

Theoretical Model Overview & Concepts

In the 1950's Donald Kirkpatrick developed the *Kirkpatrick Evaluation Model* to objectively assess the efficacy and impact of a training intervention. The *Kirkpatrick Evaluation Model* evaluates the value of any type of training transversely across four levels: reaction, learning, behavior, and results (Kirkpatrick Partners, 2016) (See Figure 1).

The Vanderbilt University Center for Professional Health (CPH) utilizes this model as the framework for assessing the effectiveness of the *Proper Prescribing of Controlled Prescription Drugs for Tennessee* course in the classroom setting. Because this Scholarly Project is a pilot study containing materials presented in the CPH course, exact replication of the theoretical framework was necessary and no changes were made.

Level 1 assesses the reaction of the participants and the degree to which they found the training to be favorable and relevant; Level 2 assesses the degree to which participants acquired the intended knowledge, skills, and attitude (Kirkpatrick Partners, 2016). Level 3 assesses the degree to which participants apply the material obtained during the training and Level 4 assesses the degree to which the desired outcomes occur as a result of the training (Kirkpatrick Partners, 2016).

Assumptions

Since the proposal and development of the *Kirkpatrick Evaluation Model* researchers and trainers have identified three main assumptions that appear unintended by Kirkpatrick himself.

The first assumption is that the levels are arranged in ascending value. Meaning, the measure of Level 2- Learning, provides more information than the measure of Level 1- Reaction, and so forth (Alliger & Janak, 1998). The second assumption is that these levels of evaluation are causally linked. This linkage denotes that a training intervention leads to reaction, which leads to learning, which leads to behavior, which leads to results. The third and final assumption is that the levels are positively inter-correlated. That is, a set of positive interrelationships exist between the various evaluation levels (Alliger & Janak, 1998). Each of these assumptions stems from the idea that the *Kirkpatrick Evaluation Model* is a hierarchical model of training evaluation.

Theory Application

Kirkpatrick Evaluation Model is being utilized as the framework for this Scholarly Project because of the step-by-step assessment of the effectiveness of a training intervention. Levels 1, 2, and 3 of the *Kirkpatrick Evaluation Model* have been applied to this Scholarly Project.

Level 1- Reaction, was applied by assessing the degree to which the participants found this educational intervention to be useful. Four questions in the Course Evaluation Survey assess the participant's perspective of the overall quality of the information, the perceived individual value, and the degree to which the individual's needs were met. Level 2- Learning, was applied by assessing the participant's Pre and Post-Test Survey

answers associated with each educational module. A correct change in answer from the Pre-Test to Post-Test indicates that learning of the desired material has taken place.

Level 3-Behavior, was applied to the project by assessing the participant's intended behavior change. Two questions in the Course Evaluation Survey assess the participant's intended change in practice and personal change. Level 4- Results, was not applied in this project, but will inform recommendations at the conclusion of the project. Due to the short implementation period of the project, it was not feasible to assess the long-term changes in prescriber behavior that occur after the educational intervention.

Project Design

This study was designed to pilot an online educational intervention for nurse practitioner prescribers. The Project Leader used a cross-sectional, survey-based design to evaluate the effectiveness of the intervention. Participant pre and post intervention knowledge were measured immediately before and after the educational modules were completed. A Demographics and Course Evaluation Survey were also completed to determine participant satisfaction. The dependent variables of the study included participant knowledge, attitude, and intent to change practice, all of which are ordinal level measurements. All nominal level measurements obtained through multiple-choice survey and demographic questions represented the independent variables. This project was verified as exempt by Belmont University's Institutional Review Board.

Project Population

All participants of this study were licensed nurse practitioners in the United States who graduated from Belmont University's Graduate School of Nursing between December 2011 and May 2015. This sample represents new nurse practitioners who are

in active clinical practice, but have not yet recertified and completed continuing education hours related to controlled substance prescribing per the recertification requirements found in the Tennessee Code Ann. §1000-4-.05. A purposive sample of potential participants was identified through Belmont University's Alumni directory, accessed with permission from the Belmont University Alumni Association. Each participant provided informed consent by voluntarily agreeing to participate in the study. All participants were given full access to the two modules, there was no control group assigned.

Inclusion criteria included: 1) successful completion and graduation from Belmont University's Graduate School of Nursing and 2) date of graduation between December 2011 and May 2015. Exclusion criteria included: 1) graduates who participated in the post-masters graduate program. These graduates were not eligible for participation because it is unknown if he/she graduated from Belmont University's masters degree program prior to attending Belmont's post-masters to Doctor of Nursing Practice program.

Project Setting and Educational Intervention

Vanderbilt University's Center for Professional Health creates online learning modules to capture the content of the on-campus controlled substance prescribing continuing medical education (CME), but in a format that is more cost effective and accessible to a larger audience (Charlene Dewey, personal communication, February 11, 2016). It is important to note providers, including nurse practitioners, who register for the on-campus program have already been identified by his/her governing body as having irresponsible prescribing habits. Participation in the course is often mandatory and

required to have their license re-instated. Offering this content online to new nurse practitioners before recertification requirements represents an upstream intervention aimed at early intervention for practitioners before they are identified as irresponsible prescribers.

These modules were developed by Dr. Charlene Dewey, with advanced practice registered nurses (APRN's) in mind but have not yet been disseminated to a larger audience. This Scholarly Project pilots two of the online modules developed by the CPH to assess for knowledge gain within the designated sample group, indicating this content can be used as prevention or early intervention for new nurse practitioners who may be at high risk for irresponsible prescribing.

Learning objectives in *Module 1: Overview of Pain and Tennessee Chronic Pain Guidelines* were related to appropriate classification of pain, adjuvant therapies, pharmacologic treatments, and appropriate use of Tennessee chronic pain guidelines. Learning objectives in *Module 2: Best Clinical Practice* were related to targeting and screening for SUD and the use of clinical best practices appropriately.

Sources of Data/Data Collection Instruments

Two online educational modules and associated Pre and Post-Tests and Course Evaluation form from PCH's *Proper Prescribing of Controlled Prescription Drugs for Advanced Practice Nurses* course were used in this study to determine if participants had a change in knowledge, attitude, and/or practice. *Module 1: Overview of Pain and TN Chronic Pain Guidelines* Pre and Post-Test survey was composed of eight multiple-choice questions and *Module 2: Best Practice for Proper Prescribing of CPD* Pre and Post-Test survey was composed of five multiple-choice questions. The survey questions

reflect a high level of rigor and require not only recall of information, but also understanding, application, and analysis to draw connections among topics (Armstrong, 2017). The Course Evaluation survey was composed of seven multiple-choice questions. A 12 question Demographics Survey was created to gather additional participant information. (See Appendix A for Surveys).

The two educational modules were made available to participants through Electa Live©. Qualtrics survey software was used to distribute the survey questions and to collect Pre and Post-Test, Demographic Survey, and Course Evaluation data. Descriptive data were analyzed using Microsoft Excel 2011.

Belmont University's Graduate School of Nursing curriculum was audited for content related to controlled substance prescribing, of which all participants received during their education. Participants received comparable content related to controlled substance prescribing; minimal adjustments were made annually to ensure content accuracy (Leslie Higgins, personal communication, April 25, 2017). Course syllabi, objectives, assignments, and evaluation items were assessed for content surrounding the assessment and management of acute and chronic pain as well as the legal/regulatory implications of controlled substance prescribing.

Data Collection Process/Procedures

Data collection took place from October 1 to December 1, 2016. Incentive to participate included a $100 Visa gift card drawing. An initial invitational e-mail and video was sent to potential participants. Those who accepted the invitation to participate were then sent a subsequent e-mail containing directions, as well as a link and username and password to access the PowerPoint based modules via the Electa Live© virtual

classroom platform. In the directions, the participants were informed both how to access Electa Live© and the PowerPoint modules. The directions also stated that the survey links in the slides were to be completed in the order that they appeared and all responses were anonymous and contained no identifying information (See Appendix B). All Pre/Post-Test, Demographic Survey, and Course Evaluation data was saved using Qualtrics for later evaluation and statistical analysis.

Results

Of the 114 graduates from Belmont University's FNP program who were invited to participate, 5.18% (N= 22) participated. Of which, 91% (N=20) completed all components of the study including the online educational modules, pre and post-tests, and demographics survey. Two participants failed to complete the course evaluation (N=20).

Demographics. The target population for this project was recent graduates early in their careers as nurse practitioners. The socio-demographic characteristics of the participants are presented in Table 1. Of the 22 participants, two identified as working in urgent care, seven in primary care, one in pain management, six in a specialty practice and six in "other" category practices. Over half (N=13) of the respondents reported working in an urban setting, while the remaining (N=9) reported working in a rural setting. Both years of active clinical practice and length of time at current practice ranged from 0 to 5 years; the mean years of active practice was 2.14 years. The average time participants had been working in their current clinical practice was 1.73 years. Of the participants, eight reported working primarily with the adults, two with geriatrics, one with pediatrics, five in mixed primary care, and six in "other" patient populations. The

majority of participants, 90.0% (N=20), reported working in the state of Tennessee, while 4.5% (N= 1) reported Missouri, and 4.5% (N=1) Texas.

Practice Structure. The reported availability of the supervising physician varied, four reported working in a private practice with a supervising physician available by phone, three reported working with a group of NP's with a supervising physician available by phone, and fifteen reported working with a supervising physician available on site. Over one third (N=17) of respondents reported having protocols in place surrounding controlled substance prescribing, while the remaining (N=5) respondents reported having no established protocols.

Controlled Substance Prescribing. Only one respondent reported not prescribing controlled substances in clinical practice. Of those remaining, two thirds (N=14) reported feeling prepared by the graduate pharmacology course they received at Belmont University, while the remaining third (N=7) reported feeling unprepared.

Item 10 of the Demographic Survey allowed respondents to select all that apply regarding major concerns related to controlled substance prescribing. The most commonly chosen item was "pressure/demand from patients," selected thirteen times, followed by "continuing a standing prescription written by another provider", selected ten times. Participants chose "treating co-occurring pain and mental health" eight times, "other" six times, and "pressure from supervising physician" one time. Of the respondents, six reported either leaving or considering leaving a job due to controlled substance prescribing habits at the practice.

Module 1 Pre and Post Test Knowledge Assessment.

Each participant's Module 1 Pre and Post Test scores were graded for accuracy. The total scores were compared to assess whether there was an increase in answer accuracy between the Pre and Post Test scores. A Paired t-test was computed on both the Pre-Test and Post-Test total scores to assess for an increase in answer accuracy. The analysis revealed that the educational intervention significantly increased participant knowledge related to controlled substance prescribing. Of the eight items on the Module 1 Pre-Test, the average total score was five out of eight correct answers. Of the same eight items on the Module 1 Post-Test, the average total score was seven out of eight correct answers. The participants gained an average of 1.591 points on the Module 1 Post-Test, with the average score being 6.59 out of eight correct answers.

Due to sample size not meeting the 30 participant assumption of the Paired t-test, the Wilcoxon matched-pairs test was used to validate statistical significance. In addition, the Shapiro-Wilk test for normality was performed and the Wilcoxon matched-pairs test was performed due to the measure not being normally distributed (See Table 3). The Wilcoxon matched-pairs test concluded that a significant difference ($p \leq .001$) existed in knowledge score before and after the educational intervention was completed (See Table 4).

An item analysis of Module 1 Pre and Post-Tests found there was a knowledge deficit in topics pertaining to the following: classifying categories of pain based on symptoms and duration of symptoms, as well as adjuvant pain treatment options. These deficits were defined by summing the total number of correct answers for each item on the survey. Respondents increased individual question scores by greater than or equal to

ten points, which indicates an increase of 45% (N=22) over Pre-Test scores (See Table 5).

Module 2 Pre and Post Test Knowledge Assessment.

Of the five items on the Module 2 Pre-Test the average score was 2.45 out of five correct answers. The participants gained an average of 2.19 points on the Module 2 Post-Test, with the average score being 4.64 out of five correct answers. This gain is statistically significant at $p \leq .001$ by the paired t-test (two-tailed) (See Table 2).

The item analysis of Module 2 Pre and Post-Tests revealed a knowledge deficit in assessing for substance use disorder, employing a systematic approach to prescribing controlled substances, and utilizing screening/monitoring tools for patients prescribed controlled substances (See Table 6).

Course Evaluation. Each participant completed a course evaluation survey, addressing the overall quality and value of the material. Of the respondents, 55% (N=11) rated the quality of the material presented as "excellent", and 45% (N=9) reported the quality of the material to be "average". Over half of the participants (N= 12) felt the presented information was "extremely valuable" to them as an individual, and the remaining eight felt it was "valuable".

After completing the educational modules ten of participants reported that they would "probably make a practice related change", five reported they would "definitely make a practice related change," one reported they would "probably not make a practice related change," and two reported they would "definitely not make a practice related change."

Discussion

Participant Knowledge Score. The main finding of this study was that participant knowledge surrounding controlled substance prescribing significantly increased after completing the educational modules. This finding is consistent with McCracken, Biochat, and Eccleston (2012), who also found an increase in participant knowledge and intent to change prescribing practices directly associated with educational related to guidelines. This increase in knowledge score from Pre-Test to Post-Test is consistent with Level 2-Learning, of the *Kirkpatrick Evaluation Model.* This indicates that the educational intervention influenced increased learning of the desired material.

Although 63.6% of study participants reported feeling as though their graduate level pharmacology course adequately prepared them to prescribe controlled substances with confidence, over three fourths of the respondents indicated they would "definitely" or "probably" make a practice related change after completing the educational intervention. This suggests that despite the perception of adequate graduate level training in pharmacology, the intention to change practice suggests that there was content presented in the modules that the participants may not have known they were missing. In comparison to Module 1, there was a larger increase in Module 2 Post-Test scores suggesting information pertaining to systematic prescribing of controlled substances, as well as targeting and screening of SUD is missing from graduate level courses, or perhaps not presented in a manner that provokes knowledge retention.

The Tennessee Board of Nursing now requires continuing education credits specifically related to controlled substance prescribing in order to renew certification licensure every five years (Tennessee Code Ann. §1000-4-.05). This action by the Board

of Nursing supports the importance and urgency of nurse practitioners needing this information in primary care. The nurse practitioners in this sample represent providers new to practice who have not yet completed the required continuing education related to controlled substance prescribing, making them and their patients more vulnerable to error.

Consistent with previous literature findings, this study also found knowledge deficits to be a factor that could influence prescribing habits (Chiauzzi, Trudeau, Zacharoff, & Bond, 2011; Fontana, 2008; Hooten & Bruce, 2011; Spitze, Moore, Papaleontiou, Granieri, Turner, & Reid, 2011). Congruent with established literature, this study found that practitioner knowledge deficits are present in the ability to classify pain, recognize appropriate adjuvant therapies, utilize systematic prescribing approaches, and the ability to assess, screen, and monitor for SUD (Chiauzzi, Trudeau, Zacharoff, & Bond, 2011; Fontana, 2008).

This suggests, despite adequate completion of a graduate level family nurse practitioner program, there is a significant time lapse between education and autonomous practice. There is knowledge attrition that occurs during this time period, which may impact prescribing practices. The findings of this study suggest refresher courses may significantly increase the knowledge level of nurse practitioners who have not yet been required by the Board of Nursing to complete continuing education directly related to controlled substance prescribing.

Leading Concern Surrounding Prescribing. The deficit concerning practitioner ability to assess, screen, and monitor for SUD in combination with the most frequently reported concern surrounding controlled substance prescribing, the “pressure/demand

from patients", further suggests that new nurse practitioners lack the confidence to identify and respond to SUD.

This study directly reports the pressures new nurse practitioners face from patients who are seeking controlled substances and highlights the lack of knowledge in assessing, screening, and monitoring for SUD in primary care. These findings illuminate the unique role nurse practitioners play in the controlled substance abuse epidemic. New nurse practitioners and their patients are vulnerable to these complex challenges and may benefit from educational interventions targeting both the identified knowledge deficit and the development of clinical skills to implement controlled substance guidelines, with specific focus on screening for risk of SUD before starting controlled substances, recognizing risk of SUD, and intervening appropriately when SUD is suspected or confirmed.

Online Presentation Format. Although the mean knowledge score of the participants increased significantly, the delivery method of the educational modules proved to be unappealing to most who were invited to participate. Tjin, Tsoi, de Boer, Croiset, Koster, and Kusurkur (2016) report participants find online formatting convenient, however face-to-face meetings with peers was an important factor influencing participation in healthcare continuing education courses. This is consistent with McCracken, Biochat, and Eccleston's (2012) findings, that health care professionals prefer more engaging and emotionally evocative learning methods.

The low participation rate of this study highlights the challenge associated with reaching this target population and the lack of awareness of their current knowledge deficit. Often additional education is not sought out until the knowledge deficit has

manifested itself as a liability to their professional livelihood or patient safety (Charlene Dewey, personal communication February 11, 2016). The low response rate does not indicate the quality of the content or even the delivery format is inadequate. In fact, retention rates were high as were overall ratings of the material quality. This suggests despite the online presentation format, participants were engaged in the content and found the information valuable as a health care provider.

Piloting these modules in an online format was intended to gauge if the ease of content accessibility increased the likelihood of participation. While continued research needs to be conducted to further assess this presentation method, it can be inferred from this study's findings that the online format is successful in yielding an increase in knowledge level but is not likely to create voluntary uptake of this information by new graduate nurse practitioners until required by the Board of Nursing for recertification. It can be expected that voluntary participation is more likely from those providers who have already encountered challenges related to controlled substance prescribing in their practice. The five-year time lapse between graduation and recertification of licensure leaves the new graduate nurse practitioner at risk for misprescribing and ultimately poses patient safety risks.

Implications for Practice. When the curriculum was audited, information pertaining to controlled substance prescribing was found in one online voice-over PowerPoint and only one test question throughout Belmont University's family nurse practitioner program pertained to controlled substance prescribing. Part of the solution to the identified knowledge gap could be better integrating this content into graduate level curriculum and enforcing it throughout multiple courses. This will better prepare students

to recognize the wide range of comorbidities that often parallel SUD in controlled substance seeking patients, such as co-occurring mental health issues.

Graduate level learning is highly motivated by what content is tested on exams and national certification boards. In the future, if more emphasis is placed on the importance of this topic, it is likely graduate level students will focus on and retain this content into active clinical practice. CPH is working downstream to identify health care providers who have already been recognized as having improper prescribing habits. Integrating this content into graduate level education would work on the forefront as early intervention and likely prevent mandated remediation by licensing bodies.

Strengths and Limitations. One strength of this study is that it demonstrates the effectiveness of the educational intervention in improving participant knowledge. It also evaluates new graduate nurse practitioners who have not yet been required to complete controlled substance continuing education, required by the state of Tennessee. Information pertaining to this specific group of nurse practitioners is unique because it reflects these providers relying solely on the education they received in graduate school to make clinical decisions. A gap in knowledge was identified between the Pre and Post-Tests, suggesting opportunity for further learning, specifically related to screening and referral for the treatment of SUD. This information clarifies what improvements could be made to better prepare nurse practitioners for clinical practice. Another strength of this study is the full-bodied content within the educational modules created by CPH.

One limitation of this study is the small sample size composed of graduates of only one educational institution. Due to this, it is questionable if the results of this study are generalizable to the greater population of new graduate nurse practitioners. Future

research efforts should involve sampling from graduates of other educational institutions throughout Tennessee and ultimately the United States.

It is also noted that the immediate assessment of knowledge post-intervention, is not necessarily indicative of knowledge retention long-term. Future research efforts should include fully employing Level 4-Results of the *Kirkpatrick Evaluation Model,* and evaluate the long-term results of the educational intervention. While this study shows an immediate post-intervention increase in knowledge it is unknown at this time if the participants will retain the information long-term. Future efforts would involve evaluating the long-term retention of knowledge and the practical application of the self-reported intent to change clinical practice by participants. Another recommendation is to display the correct answer and rationale to Pre and Post-Test questions after completion. By providing constructive feedback participant long-term knowledge retention and clinical practice may by influenced.

One final limitation would include the limited number of module assessment questions that may not accurately capture comprehensive knowledge pertaining to controlled substances. However, assessment items were written to assess high-level learning requiring content recall, application, and analysis. A more lengthy assessment of learning may contribute to response fatigue and increase attrition.

Conclusion

Six new providers reported considering leaving or leaving a job due to controlled substance practices, thirteen reported experiencing pressure from patients to prescribe, and only seventeen reported having protocols in place surrounding the prescribing of controlled substances. Over 60% of participants reported feeling prepared to prescribe

controlled substances with confidence, however, after completing the online educational intervention over three fourths of the sample reported the intent to make a practice related change. These data suggest new graduate nurse practitioners may be vulnerable to the professional risks of misprescribing, leaving their patients vulnerable to iatrogenic addiction, overdose, and accidental death.

These results offer strong support that additional resources in the form of continuing education are needed before the mandated five-year recertification requirement. This study found a significant increase in knowledge surrounding controlled substance prescribing after completing the online educational intervention. However, the difficulty arises in creating motivation in new providers to seek additional resources before it is mandated by the state board for recertification or by law for remediation due to improper prescribing practices.

With over 50% of opioid prescriptions originating in primary care and 83.4% of nurse practitioners being certified in areas of primary care it is essential to better educate and prepare new graduates on how to properly prescribe controlled substances (Hudspeth, 2016; American Association of Nurse Practitioners, 2016). The CDC has taken action by releasing *The CDC Guideline for Prescribing Opioids for Chronic Pain* but this alone does not address many of the reported issues surrounding controlled substance prescribing, further supporting the need of additional resources for new graduate nurse practitioners.

References

Abdulghani, H., Shaik, S., Khamis, N., Al-Drees, A., Irshad, M., Khalil, M., & ... Isnani, A. (2014). Research methodology workshops evaluation using the Kirkpatrick's model: Translating theory into practice. *Medical Teacher*, *36*S24-9 1p. doi:10.3109/0142159X.2014.886012

Alliger, G. M., & Janak, E. A. (1989). Kirkpatrick's levels of training criteria: thirty years later. *Personnel Psychology*, *42*(2), 331-342.

The American Association of Nurse Practitioners. (2017). *Np fact sheet.* Retrieved from https://www.aanp.org/all-about-nps/np-fact-sheet

Armstrong, P. (2017). *Blooms taxonomy.* Retrieved from https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Brown, M., Swiggart, W., Dewey, C., & Ghulyan, M. (2012). Searching for answers: proper prescribing of controlled prescription drugs. *Journal Of Psychoactive Drugs*, *44*(1), 79-85.

Centers for Disease Control and Prevention. (2016). *CDC guideline for prescribing opioids for chronic pain.* Retrieved from http://www.cdc.gov/drugoverdose/prescribing/guideline .html

Center for Professional Health. (2016). *About the center.* Retrieved from http://www.mc.vanderbilt.edu/root/vumc.php?site=cph&doc=36583

Chiauzzi, E., Trudeau, K. J., Zacharoff, K., & Bond, K. (2011). Identifying primary care skills and competencies in opioid risk management. *Journal of Continuing Education in the Health Professions, 31*(4), 231-240. doi:10.1002/chp.20135

Clay-Williams, R., Greenfield, D., Stone, J., & Braithwaite, J. (2014). On a Wing and a Prayer: An Assessment of Modularized Crew Resource Management Training for Health Care Professionals. *Journal Of Continuing Education In The Health Professions*, *34*(1), 56-67 12p. doi:10.1002/chp.21218

Department for Professional Employees. (2016). *Health care professionals and technicians.* Retreived from http://dpeaflcio.org/professionals/professionals-in-the-workplace/healthcare-professionals-and-technicians/

Fontana, J. S. (2008). The social and political forces affecting prescribing practices for chronic pain. *Journal of Professional Nursing*, *24*(1), 30-35. doi:http://dx.doi.org/10.1016/j.profnurs.2007.06.002

Hooten, W. M., & Bruce, B. K. (2011). Beliefs and attitudes about prescribing opioids among healthcare providers seeking continuing medical education. *Journal of Opioid Management*, *7*(6), 417-424.

Hudspeth, R.S. (2016). Safe opioid prescribing for adults by nurse practitioners: part 1. Patient history and assessment standards and techniques. *The Journal for Nurse Practitioners*, 12(3), 141-148.

Kirkpatrick Partners. (2016). *The kirkpatrick model.* Retrieved from http://www.kirkpatrickpartners.com/OurPhilosophy/TheKirkpatrickModel/tabid/302/Default.aspx

Lippincott Nursing Center. (2016). *Continuing education requiremnts for nurses by state.* Retrieved from http://www.nursingcenter.com/ceconnection/ce-state-requirements#tennessee

McCracken, L. M., Boichat, C., & Eccleston, C. (2012). Training for general practitioners in opioid prescribing for chronic pain based on practice guidelines: a randomized pilot and feasibility trial. *Journal of Pain,* 13(1), 32-40.

National Institute of Drug Abuse. (2014). *America's addiction to opioids: heroin and prescription drug abuse.* Retrieved from http://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2015/americas-addiction-to-opioids-heroin-prescription-drug-abuse

Nursing Theories. (2011). *Change theory.* Retrieved from http://currentnursing. com/nursing theory/change_theory.html

Roth, C. S., & Burgess, D. J. (2008). Changing residents' beliefs and concerns about treating chronic non-cancer pain with opioids: evaluation of a pilot workshop. *Pain Medicine (Malden, Mass.), 9*(7), 890-902. doi:10.1111/j.1526-4637.2008.00458.x

Smith, R. C., Frank, C., Gardiner, J. C., Lamerato, L., & Rost, K. M. (2010). Pilot study of a preliminary criterion standard for prescription opioid misuse. *The American Journal on Addictions / American Academy of Psychiatrists in Alcoholism and Addictions, 19*(6), 523-528. doi:10.1111/j.1521-0391.2010.00084.x

Spickard, A., Dodd, D., & Swiggart, W., Dixon, G., Pichert, J. (1998). Physicians who misprescribe controlled substances: a cme alternative to sanctions. *Federation Bulletin, 85,* 8-19.

Spitz, A., Moore, A. A., Papaleontiou, M., Granieri, E., Turner, B. J., & Reid, M. C. (2011). Primary care providers' perspective on prescribing opioids to older adults

with chronic non-cancer pain: a qualitative study. *BMC Geriatrics, 11*, 35-35. doi:10.1186/1471-2318-11-35

Srivastava, A., Kahan, M., & Jiwa, A. (2012). Prescription opioid use and misuse: piloting an educational strategy for rural primary care physicians. *Canadian Family Physician Médecin De Famille Canadien*, *58*(4), e210-e216.

Tennessee Code Annotated. §63-7-207 (2016).

Tennessee Code Annotated. §1000-4-.05 (2016).

Tennessee Department of Health. (n.d.). *Board of nursing.* Retrieved from https://tn.gov/health/article/nursing-coedu

Tennessee Department of Mental Health and Substance Abuse Services. (2014). *Prescription for success: statewide strategies to prevent and treat the prescription drug abuse epidemic in Tennessee.* Retrieved from http://tn.gov/behavioral-health/topic/prescription-for-success

Tennessee Nurses Association. (n.d.a). *Advanced practice registered nurses (aprns) prescribing opioids in Tennessee.* Retrieved from http://www.tnaonline.org/document.doc?id=577

Tennessee Nurses Association. (n.d.b). *History of advanced practice registered nursing in Tennessee.* Retrieved from http://www.tnaonline.org/document.doc?id=431

Tjin A., Tsoi, S., de Boer, A., Croiset, G., Koster, A., & Kusurkar, R. (2016). Factors influencing participation in continuing professional development: a focus on motivation among pharmacists. *Journal Of Continuing Education In The Health Professions*, *36*(3), 144-150. doi:10.1097/CEH.0000000000000081

The U.S. Department of Health & Human Services. (2016). *Opioids: the prescription drug & heroin overdose epidemic.* Retrieved from http://www.hhs.gov/opioids/

Volkow, N. (2015). *What is the federal government doing to combat the opioid abuse epidemic?* Retrieved from https://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2016/what-federal-government-doing-to-combat-opioid-abuse-epidemic

Zelenikova, R., Beach, M., Ren, D., Wolff, E., & Sherwood, P. R. (2015). Graduate nursing students' evaluation of EBP courses: A cross-sectional study. *Nurse Education Today*, *35*(1), 265-270 6p. doi:10.1016/j.nedt.2014.09.010

Figure 1. Theoretical Model

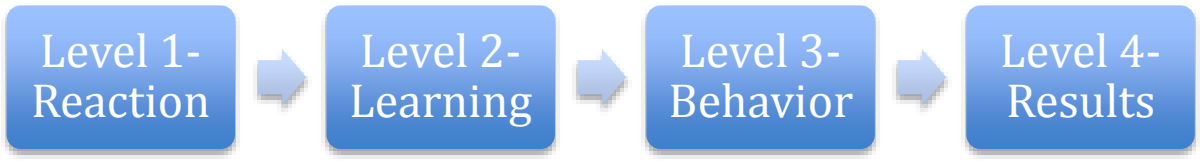

Table 1. Demographics

Variable	N (%)	Mean
Clinical Practice Setting	**22**	
Urgent Care	2 (9.1%)	
Primary Care	7 (31.8%)	
Pain Management	1 (4.5%)	
Specialty Practice	6 (26.1%)	
Other	6 (26.1%)	
Clinical Practice Location	**22**	
Rural	9 (40.9%)	
Urban	13 (59.1%)	
Years of Active Clinical Practice	**22**	**2.14**
0-12 Months	7 (31.8%)	
13 months-2 years	10 (45.5%)	
25 months – 3 years	1 (4.5%)	
37 months – 4 years	3 (13.6%)	
49 months – 5 years	1 (4.5%)	
5+ years	0 (0%)	
Primary Patient Population	**22**	
Adult	8 (36.4%)	
Geriatric	2 (9.1%)	
Pediatric	1 (4.5%)	

Mixed Primary Care	5 (22.7%)	
Other	6 (27.3%)	
Length of Time at Current Practice	**22**	**1.73**
0-12 Months	11 (50%)	
13-24 Months	8 (36.4%)	
25-36 Months	1 (4.5%)	
37-48 Months	2 (9.1%)	

Table 2. Paired t-Test

Paired Samples Statistics Module 1

Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Total Module 1 Pre-Test	5.00	22	1.195	.255
Total Module 1 Post-Test	6.59	22	.590	.126

Paired Samples Test Module 1

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval	t	df	Sig (2 tailed)
Pair 1- Total Module 1 Pre- Total Module 1-Post	1.591	1.141	.243	Lower 1.085 Upper 2.097	6.542	21	.000

Paired Samples Statistics Module 2

Pair 2	Mean	N	Std. Deviation	Std. Error Mean
Total Module 2 Pre-Test	2.45	22	.739	.157
Total Module 2 Post-Test	4.64	22	.581	.124

Paired Samples Test Module 2

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval	t	df	Sig (2 tailed)
Pair 2- Total Module 2 Pre- Total Module 1-Post	2.182	.795	.169	Lower 1.829 Upper 2.534	12.872	21	.000

Table 3. Shapiro-Wilk Test of Normality

	Statistic	df	Sig .
Total Mod2Post	.645	22	.000
Total Mod2Pre	.846	22	.003
Total Mod1Pre	.920	22	.078
Total Mod1Post	.677	22	.000

Table 4. Wilcoxon Matched-Pairs Test

Test Statistics (a)

	Total Module 1 Post- Total Module 1 Pre	Total Module 2 Post- Total Module 2 Pre
Z	-3.742 (b)	-4.181 (b)
Asymp. Sig (2-tailed)	≤ .001*	≤ .001*

(a) Wilcoxon Signed Ranks Test
(b) Based on negative ranks
* Significant at .05

Table 5. Module 1 Item Analysis

Item	% Correct Pre	% Correct Post	% Gain
1	82 (N=18)	100 (N=22)	18
2	41 (N=9)	86 (N=22)	45
3	5 (N=1)	0 (N=0)	-5
4	59 (N=13)	91 (N=20)	32
5	73 (N=16)	18 (N=4)	-45
6	82 (N=18)	100 (N=22)	18
7	91 (N=20)	100 (N=22)	9
8	68 (N=15)	100 (N=22)	27

Table 6. Module 2 Item Analysis

Item	% Correct Pre	% Correct Post	% Gain
1	100 (N=22)	100 (N=22)	0
2	45 (N=10)	86 (N=19)	40
3	45 (N=10)	95 (N=21)	50
4	14 (N=3)	86 (N=19)	72
5	41 (N=9)	95 (N=21)	55

Appendix A

Course Surveys

Module 1 Pre/Post Test

1. Pain can be classified into three main classifications. Which option lists the correct classifications of pain?

    a) Central, peripheral, and complex regional
    b) Neurologic, musculoskeletal, and central
    c) Bone pain, soft tissue pain, and organ-based pain
    d) Neuropathic pain, nociceptive pain and psychogenic pain
    e) None of the above
    f) I don't know

2. Trigeminal neuralgia would best be classified into what category of pain?

    a) Psychogenic
    b) Soft tissue
    c) Central and peripheral
    d) Inflammatory
    e) All of the above
    f) I don't know

3. Dr. Moab is a 35 yo male physician in family medicine. He is a healthy young man who abstains from alcohol for religious reasons and has never used illicit street drugs. Dr. Moab presents to your urgent walk-in clinic after falling while hiking in Utah on a family vacation 3 days ago. His fall resulted in a pretty badly bruised right hip/trochanteric area, a right twisted ankle and a right lateral knee injury with bruising and superficial lacerations. He also has several lacerations on his right hand. His pain is 7/10. How would you best classify Dr. Moab's pain based on time?

    a) Acute
    b) Semi-acute
    c) Intermittent
    d) Chronic
    e) I don't know

4. How would you best classify Dr. Moab's source of pain?

    a) Neuropathic
    b) Somatic
    c) Visceral
    d) Complex regional pain syndrome
    e) I don't know

5. Mr. L presents with acute low back pain after moving a dresser. His pain is 5/10 that he describes as dull and achy with muscle spasms. He has tenderness along the paraspinal muscles. Which adjuvant would be a good addition to pain control and PT?

    a) SNRI
    b) Pain rehabilitation
    c) TENS unit
    d) Bisphosphonates
    e) Sympathetic nerve block
    f) I don't know

6. Mr. C presents with 7 days of 9/10 neck pain and stiffness after swimming at the start of summer. He doesn't like taking medications so has not tried anything and has mildly elevated LFTs. What would be an appropriate first line treatment for this type of pain?

    a) Acetaminophen
    b) Cyclobenzaprine
    c) Hydrocodone

d) Naproxen sodium
e) Codeine
f) None of the above
g) I don't know

7. Ms. T is an office receptionist who complains of a pain that "radiates down" her right leg into her foot/great toe for 4 days. The pain started as a mild ache in her back and then developed into a burning sensation. Sometimes it feels like an electric shock if she coughs or sneezes. She also notes that prolonged sitting makes it worse. She denies fever, rash, bowel/bladder changes or leg weakness and no acute traumas. What is your most likely diagnosis?

a) Zoster
b) Avascular necrosis of the femoral head
c) Diabetes – peripheral neuropathy
d) Sciatica
e) I don't know

8. Ms. J has chronic low back pain. She did not tolerate OTC NSAIDs and has hepatitis C. You referred physical therapy and she is compliant but not significantly improved. What would be an appropriate next step if you follow the TN chronic non-malignant pain guidelines algorithm?

a) Discharge from the office practice
b) Start an opioid at low dose
c) Screen for SU with UDT and check the drug monitoring program
d) Tell the patient the pain is complicated and requires treatment from an interventionist
e) None of the above
f) I don't know

Module 2 Pre/Post-Test

1) A 32 yo female patient presents with hematuria x 3 weeks, mild right flank pain x 3 days, and nausea without vomiting x 1 day. She states the pain is 3-5/10 at best and 7/10 at the worst. Currently, she is comfortable, pain level is 3/10 and she has not taken any pain meds up to this time. The CT demonstrates 2 renal stones in the right ureter without obstruction and hydronephrosis, as well as 2 stones in the renal pelvis. If we prescribe CPD for this patient, what proper prescribing practices should be followed?

a) Screen this patient for substance use.
b) Check the prescription drug monitoring program for your state.
c) Discuss contraception prior to prescribing CPD.
d) Discuss risk of dependence using a CPD.
e) All of the above
f) None of the above
g) I don't know

2) Which patients, if any, would you screen using SBIRT?

a) Pt is a 16 yo male with non-tender white patches in his mouth. They have been there for about 3 months.
b) Pt is a 23 yo female nursing student who blacked out after a night of partying and comes in for a superficial laceration on her right forearm.
c) Pt is 44 yo homeless male requesting hydrocodone for his migraine HA.
d) Pt is 32 yo female with pain post-op day #1. Her friend suggested hydrocodone.
e) All of the above
a) None of the above
b) I don't know

3) A patient calls in early for refills twice in the past 4 months and the UDS is positive for marijuana. Which tool can you use to assess for a substance use disorder?

a) The MMSE
b) CAGE-AID
c) BMP
d) Confirmatory UDT

e) All of the above
f) None of the above
g) I don't know

4) What are the four steps in the four step approach to systematically prescribing CPDs in your practice?

a) SBIRT, check the PDMP, consent and document
b) Check family history, PDMP, UDS and document
c) Subjective/Objective, SBIRT, Assessment/Plan and document
d) HPI, pain levels, UDS and document
e) Screen for PDMP, UDS, CPD use and ORT
f) I don't know

5) Which of the following screening/monitoring tools can be used for patient on CPDs?

a) UDS, PDMP, Cage-AID, ORT, COMM
b) COMM, Audit, T-ACE, 5-A's
c) ORT, UDS, CRAFFT and SOAPP-R
d) PDMP, MAST, Assist, Audit, T-ACE
e) I don't know

Course Evaluation

1. How would you rate the overall quality of the activity?
- **a.** Poor
- **b.** Average
- **c.** Excellent
- **d.** Comments:

2. How valuable was the activity to you as an individual?
- **a.** No value at all
- **b.** Valuable
- **c.** Extremely Valuable
- **d.** Comments:

3. How well did this activity meet your needs?
- **a.** Did not meet my needs
- **b.** Somewhat met my needs
- **c.** Completely met my needs
- **d.** N/A

4. What did you value or like most about this activity?
- **a.** Comments:

5. What about this activity can be improved?
- **a.** Comments:

6. Based on your participation in this activity, how likely are you to make a practice related change?
- **a.** Will definitely make a change
- **b.** Will probably make a change
- **c.** Will probably NOT make a change
- **d.** Will definitely NOT make a change
- **e.** Not applicable
- **f.** Please describe the changes you will/probably will make or reasons for NOT making changes:

7. Based on your participation in this activity, how likely are you to make a personal related change?
- **a.** Will definitely make a change
- **b.** Will probably make a change
- **c.** Will probably NOT make a change
- **d.** Will definitely NOT make a change
- **e.** Not applicable
- **f.** Please describe changes you will/probably will make or reasons for NOT making changes:

Demographics Survey

1. What is your clinical practice setting
   a. Urgent Care
   b. Primary Care
   c. Pain Management
   d. Specialty Practice
   e. Other _____
2. What is your clinical practice location
   a. Rural area
   b. Urban area
   c. Other _____
3. Years of active clinical practice
   a. _____
4. Primary patient population
   a. Adult
   b. Geriatric
   c. Pediatric
   d. Family Practice
   e. Other _____
5. State of Practice
   a. _____
6. Year and month of graduation
   a. _____
7. Length of time at current practice site
   a. _____
8. Select which best describes your practice organization
   a. Work in private practice with supervising physician available by phone
   b. Work with a group of nurse practitioners with supervising physician available by phone
   c. Work with supervising physician available on site
   d. Other _____
9. Does your practice have protocols in place guiding practice around prescribing controlled substances?
   a. Yes
   b. No
10. Have you left a job or considered leaving your job because of controlled substance prescribing practices or expectations at the site?
    a. Yes
    b. No
    c. If yes, (enter skip logic)
11. Which of the following best describes your greatest challenge related to prescribing controlled substances? (check all that apply)
    a. Pressure from supervising physician
    b. Pressure/demand from patients
    c. Continuing a standing prescription written by another provider
    d. Treating co-occurring pain & mental health
    e. Other_____
12. Do you feel that your graduate level pharmacology class prepared you to prescribe controlled substances with confidence?
    a. Yes

b. No
c. Other_____

Appendix B

Electa Live Access Instructions

Electa Live Access Instructions
1. Open e-mail from noreply@school-network.net 2. Clink on URL link 3. Copy & paste username & password into appropriate boxes 4. Click “Login” 5. Select “Resource Library” 6. Select “Module 1- Overview of Pain” PowerPoint 7. Download to computer 8. Open PowerPoint 9. Read slides 10. Click the survey links on the slide 11. Complete the surveys in the order listed 12. Repeat steps 7-11 for “Module 2- Best Practice” PowerPoint