



12-7-2016

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Pearson, Analisa, "Attitudes, Beliefs, and Factors Affecting Nurse Opioid Administration" (2016). *Nursing Capstones*. 230.
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ATTITUDES, BELIEFS, AND FACTORS AFFECTING NURSE OPIOID

ADMINISTRATION

By

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Bachelor of Science in Nursing, Winona State University, 1998

An Independent Study

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Science

Grand Forks, North Dakota

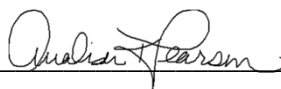
October

2016

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Title Attitudes, Beliefs, and Factors Affecting Nurse Opioid Administration
Department Nursing
Degree Master of Science

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Date December 7, 2016

Abstract

Wide variability in opioid administration and the chronic under treatment of pain continues to be a nursing problem despite 20 years of acknowledgement of the problem. The rise in accidental, self-inflicted opioid overdoses has recently been called an epidemic. This has created simultaneous epidemics in the chronic under-treatment of pain, and overdose by opioid analgesics. This study reviewed the literature utilizing the Integral Nursing Theory framework to gather the factors that affect the dosage of opioids nurses give from a range dose. Nursing experience was the most consist statistically significant finding. Professional development training in opioid pain management, and peer influence were also correlated to dose selection, however education level was not. Peer influence, professional development, and improvements in nursing academic preparation are areas where the Nurse Educator can intervene to improve pain management knowledge and skills, in all four quadrants of Integral Nursing Theory.

Introduction

The Federal Drug Administration approved long acting opioids in the mid 1990's. The United States Congress declared 2001-2010 the "Decade of Pain Control and Research". The Joint Commission (JCAHO) followed suit by releasing accreditation standards for pain assessment and management beginning in 2001 (Berry & Dahl, 2000; Baker, 2016). These actions were in response to a growing recognition of the economic and health consequences of the systemic under treatment of pain (O'Leary, 1999; Coley, Williams, DaPos, Chen, & Smith, 2002). The JCAHO standards were clarified in 2009, and further clarification was released earlier this year (Baker, 2016). The 2016 clarification was activated by the growing concern over opioid and heroin overdose related deaths (Baker, 2016).

While there has been a significant increase in policies and procedures related to pain assessment, pain remains a persistent and real problem for nurses and their patient. These initiatives attempted to standardize how nurses assess pain and how they respond to their assessment (Dihle, Bjølseth, & Helseth, 2006). Approximately 116 million Americans are in pain at any given time, with around 25 million in pain daily, and another 23 million incapacitated by “severe recurrent pain” (Meldrum, 2016 p. 1365). The cost due to medical and surgical treatment, delayed healing and complications, decreased productivity, and time off work, of Americans in pain has been conservatively estimated to be between \$565 and \$635 million dollars. This cost far exceeds the economic burden of each of the top three chronic diseases in the United States, and is almost equal to the total cost of all three combined (Gaskin & Richards, 2012).

“The use of ‘as needed’ or ‘pro re nata’ (PRN) range opioid analgesic orders is a common clinical practice in the management of acute pain, designed to provide flexibility in dosing to meet an individual’s unique needs. Range orders enable necessary adjustments in doses based on individual response to treatment...Management of acute pain, including the administration and titration of range opioid analgesic orders and patient monitoring, is a critical nursing responsibility” (Gordon, Pellino, Higgings, Pasero, & Murphy-Ende, 2008 p. 131-132).

Purpose

Most practitioners choose opioids for moderate to severe pain (Kuehn, 2002); however the way they prescribe the opioids vary (Wilson, Dansie, Kim, Myoung, Moskovitz, Chow, & Turk, 2013). Hutchinson, Moreland, DeWeinman, & Horne, (2007) found that physicians' attitudes and beliefs about opioids was a greater predictor of how pain orders were written than any other factor including physician demographics, experience, or patient characteristics.

Nursing decisions about how to administer PRN doses also vary. Are differences in how nurses carry out pain orders based primarily in their attitudes and beliefs like physicians?

Gordon et al. suggested three reasons for variation, knowledge of opioid titration, fear of adverse events, and understanding of the written order in 2008 (Gordon et al., 2008).

The purpose of this review of literature was to learn how nurse attitudes, knowledge, and opinions have affected the dosage and timing of opioids administered over the past decade. Which personal or organizational characteristics and beliefs most influence whether a nurse selects the lower, middle, or upper range of the prescribed dose? Determining evidence related to how nurses are influenced in pain management is particularly important in light of the increasing concern over opioid overdose related deaths (Hoback, 2016; Wheeler, Davidson, Jones, & Irwin, 2016). The identified evidence will be utilized to make recommendations for changes in the manner that educators approach instruction for administration of opioid medication.

Significance

Acute pain is undertreated in about 50% of post-operative patients, leaving two million patients at risk for delayed healing, development of chronic pain, neuro-humoral activation, changes in mental health, exacerbation of existing conditions, and other adverse events from surgical pain alone (Polomano, Dunwoody, Krenzisched, & Rathmell, 2008). Pain results in 36% of unanticipated hospital admissions and readmissions (Polomano, et. al, 2008). Acute and chronic pain exact a high economic, physical, and emotional burden that nurses have been aware of since at least 1999, yet the problem remains largely unchanged (Institute of Medicine Report, 2011). Standardized assessment tools including the widely used Numeric Rating Scale (NRS) have been developed. Health care organizations, federal agencies, and nursing associations have

issued policies on pain assessment, management, and monitoring (Dihle, Bjølseth, & Helseth, 2006). Interdisciplinary and specialty teams have been created in health care facilities to work more effectively (Turk, Stanos, Palermo, Paice, Jaminson, Gordon, Cowan, Convington, & Clark, n.d.). Patient centered care has motivated development of new technology, which has been incorporated into the manufacture of opioid medication, and delivery mechanisms (IOM Report, 2011, Duignan & Dunn, 2009). Yet the problem of the under treatment of pain remains, and is confounded by significant increases in opioid adverse events.

An understanding of how attitudes, opinions and knowledge influences nurses to administer a specific dose in the range and at what frequency can help us understand why this problem has remained so persistent despite all the attempts to solve it. Nursing education will be able to be adapted to more precisely modify those determinants toward safer and more effective administration of opioids.

Theoretical Framework

In order to evaluate how attitudes, belief, and other factors, such as knowledge, expectations, and cultural exerts influence on nurse decision making, we have to look at several clusters of interrelated factors. Integral nursing theory explains these interrelated clusters as a framework that highlights the connections between individuals and the environment, while focusing on the whole (Shea & Frisch, 2012; Jarron 2012). Barbara Dossey described “integral process” as a way to inclusively organize phenomenon in nursing and humanity’s collective experience, centered around four views:

- “Individual interior (personal/intentional),
- Individual exterior (physiology/behavioral),
- Collective interior (shared/cultural)

- Collective exterior (systems/structures)” (Dossey, 2008 p.89).

These four quadrants or perspectives are the hallmark of integral theory. Dossey also described a concept she called “integral world view”, as a way to examine factors, such as attitudes, knowledge, and beliefs within the four quadrants in the integral process (2008 p. 89). Integrality of nursing speaks to whole beings affected by and effecting each other and their environment, all parts are interconnected (Jarrin, 2012). The nurse’s education, moral beliefs, nursing norms, workplace climate, and clinical judgement based on the situation as she interprets it, in parallel context to the patient’s education, culture, health beliefs, and perception of the situation with the overlay of the social, political, and economic climate will create the nursing care given and received (Jarrin, 2012).

A woven fabric is composed of thousands of individual fibers that are all interconnected, yet remain single strands of fiber. The strands can be of many colors, and woven into a pattern or shape making it a patterned fabric, which can be made into a wall covering, dress, or rug. A dress is a single integral piece, but within that one object there are still individual strands of fabric that are not all identical, but through shared connections in the weaving process are one. In this same way there are many strands or facets that all interweave in an interaction between a nurse and patient (Wilber 2001, Shea & Frisch, 2012). The term Integral means to integrate, to connect. In Integral Theory it is the connections of the part as a whole, while retaining the original properties of each. Integral in this context implies the use of the four quadrants (Shea & Frisch, 2012).

In the current economic and political climate, nursing constantly fights the notion that nursing can be reduced to a list of tasks or a simple flow chart that can be accomplished by non-credentialed personnel, or automated systems. Reviewing nurses’ opioid administration

decision-making through the lens of Integral Theory highlights the complexity and multifaceted nature of the clinical judgement process employed by a registered nurse in administering medication. Additionally, the attitudes, beliefs, and knowledge possessed by registered nurses influences their individual clinical judgement, confidence, and skills in managing opioids, side effects, and adverse effects inherent to managing patient pain. This project utilized the four quadrants of this theory to analyze and organize the evidence that was identified in the comprehensive literature search.

Definitions

The definitions of terms utilized in this project are presented in this section.

Pain medication is restricted to prescription opioids inclusive of all strengths and routes where the nurse must choose the dosing or frequency from a range order

Opioid administration or medication administration will be confined to administration where the nurse must choose a medication dosage from a prescriber or facility policy order. Both scheduled and PRN dosing schedules will be included, as long as the order is a range order. Range order is an order with a predetermined range of dosages or intervals determined by the patient's condition. (Glassford, 2008).

Pain in the paper will refer to both acute and chronic non-cancer pain. Nurses' experience with adult pain will be the primary focus. However, children and older adults will be included where nurse attitudes, beliefs, and practices would apply across the lifespan.

Process

I conducted a comprehensive search of PubMed, CINAHL and Cochrane for English only peer reviewed journal articles from 2006 until present. Key words searched included pain, nurse, nurse attitudes, nurse perceptions, nurse beliefs, opioid, medication administration, and

opioid titration. These keyword searches revealed 75 articles that dealt with nurse attitudes, beliefs, and practices related to opioid administration. Thirteen of the articles fit with Integral Theory and are reviewed in the next section. The evidence in the literature was critically analyzed using the Melnyk and Fineout-Overholt scale (Melnyk & Fineout-Overholt, 2011).

Literature Review

Tse and Ho (2012) conducted a quasi-experimental study utilizing the Nurses Knowledge Attitudes Survey Regarding Pain-China (NKASRP-C), with 88 nurses at two different nursing homes in China, and evaluated the percent of correct answers with various demographics of the nurses. The NKASRP-C consisted of 16 true/false questions and nine multiple choice. The content validity index for the translated NKASRP-C was 0.87, with test-retest reliability of 0.81 (Spearman r coefficient). Evaluating the percent of correct answers showed that education level, staff role, professional development training, and work experience were statistically significant findings ($p < .05$) when Spearman correlation coefficient analysis was conducted. After the pretest, pain management training was provided for eight weeks. The post test showed statistically significant increase in knowledge, and retained the statistical significance of education level; however, staff role, prior professional development training and experience were no longer significant. Tse and Ho suggested this indicated across the board benefit of pain management training. Pharmacology related questions showed the least gain in knowledge post intervention.

This study is level 3 evidence under the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Minimal time between the training and follow up survey does not allow for measuring knowledge retention or actual behavior change. The authors do not describe how or if they

calculated the number of participants for a statistically significant sample, and the sample size is small.

Yin, Tse, & Wong (2015) conducted a systematic review of the factors influencing nurses' administration of opioids. They searched several prominent databases for peer reviewed English language articles published between 2000 and 2012 pulling 1755 citations. Through review of relevancy and the use of inclusion and exclusion criteria, 39 studies were evaluated. The study designs included one randomized control trial (RCT), 12 quasi-experimental, 24 descriptive studies, and two qualitative studies

The authors concluded that work experience was a significant influence on opioid administration. Another type of experience was cited as correlating to administration. Nurses who had previously experienced post-operative pain or other considerable pain were more likely to give higher doses of opioids.

This systematic review evaluated primarily descriptive and qualitative studies, with only one RCT, making this evidence a Melnyk Pyramid Level 5 (Melnyk, & Fineout-Overholt, 2011). This review is limited by the use of English translations of several of the studies, and exclusion of non-English language studies. The lack of RCTs reviewed significantly reduces the level of evidence, and the authors allude to confounding factors as an unknown element yet to be measured.

After conducting repeated studies utilizing the Knowledge and Attitudes Survey over a period of years, McCaffery, Pasero, & Ferrell (2007) noted that over the past almost decade pain assessment had been increasing. When a patient stated their pain was an eight, more nurses documented in the chart that the patient's pain was an eight out of ten. However, the authors have found that this has not translated in practice change. Very few nurses increased the dose in

the range order when there was documented severe pain, and instead administered safe but ineffective opioid doses. Nurses believed that patients should act like they are in pain if they are actually in pain. If there is a mismatch between the stated pain and how the patient appears to the nurse, nurses tend to decide that the patient is exaggerating. Personal opinion and preconceived ideas had the greatest influence on the dose selected in a range dose and in the resulting under treatment of pain. Accurate pain assessment while important, did not influence the amount of opioid administered, however how the patient looked or behaved in the eyes of the nurse was a significant determinate.

This meta-analysis of descriptive studies is level 5 evidence under the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Limitations of this study include the authors reviewing many of their own studies. They may be biased by recall in looking at their data. With all the studies being descriptive correlational studies they cannot establish causality.

In Barnett, Mulvenon, and Dalrymple's 2010 study of opioid administration in end of life care, nurses expressed discomfort with titrating opioids due to a concern they are contributing to the patient's death. Barnett, et al., utilized a cross-sectional, descriptive survey with both qualitative and quantitative questions. A sample of 1089 nurses received the survey and 185 were returned. The returned surveys were from nurses at three different facilities in intensive care, general, and oncology units working with patients at the end of life. The respondents were almost exclusively female. Other characteristics in common were that the average age was 40 years old, with an average of 13 years of experience. The majority of the nurses had a bachelor's degree or higher. The vast majority of palliative nurses in the study had titrated opioids less than five times in the previous year. Because titration is viewed as difficult, unfamiliar, and imprecise it created a situation that reinforced that it was a risky practice.

Correlation analysis and multiple regression analysis were used to identify correlations, with work experience being the only statistically significant factor. Barnett et al., asked nurses how often they thought their peers documented when they changed the dose of opioid being given intravenously, the nurses stated less than 75% of the time. Respondents were asked if their peers often or always documented the patient's pain and other symptoms when titrating opioids, nurses responded that they believed almost half did not. The authors asked the respondents if their facility had an opioid titration policy 56% didn't know, 16% said yes (in error), and 18% stated they did not. The authors found work experience to be the significant factor in opioid dose selection within a range dose. However, they also noted that a number of nurses also indicated that they believed opioid titration was imprecise and would contribute to the patient's death. Based on the knowledge questions, knowledge of a nurse was not an indicator of the dose selected within a range dose. Respondents indicated they wanted and needed additional opioid medication training.

Limitations of this Melynk Pyramid level 6 (Melynk & Fineout-Overholt, 2011) study include that the authors chose to create their own survey. While they sought expert advice, and piloted the survey, a validated and reliable tool the Nurses Knowledge and Attitudes Survey (NKAS) is very similar in format and scope. Using the NKAS would allow for more generalizability, and assure the survey was not biased or flawed. A convenience sample was used with 17% response rate. However, the authors calculated the number of returns needed for statistical significance to be 100, which they exceeded at 181. The respondents were a somewhat homogenous group as they were all from the Midwest, 91% female, and well over half had a BSN degree or higher. In addition, the vast majority only cared for dying patients with opioid

range dosing five or fewer times in the past year. The descriptive correlational design cannot establish causality.

Nursing Home Managers (nurses) in Northern Ireland were surveyed to assess pain management knowledge, beliefs, and attitudes about administering opioids to individuals with dementia (Barry, Parsons, Passmore, & Hughes, 2012). This study included all 253 licensed nursing homes in Northern Ireland. Nine of the nursing home managers served as the pilot group for the survey. A response rate of over 39% was achieved. The 96 respondents were 90% female nurses educated in Ireland or the United Kingdom, and 96% served elderly patients with dementia in their facility. As a whole the nurse managers demonstrated sufficient knowledge about pain in individuals with dementia. However, 40% of the managers did not use pain treatment guidelines in their facility, and most expressed uncertainty about how to manage pain in individuals with dementia; in addition they expressed misgiving about opioids. The majority of the nurse managers felt non-analgesic interventions were more appropriate for elderly patients with dementia. Managers cited struggling with assessing pain, and were concerned about use of opioids in someone with altered cognition and elderly. Managers with at least 20 years of experience were most comfortable with using opioids with patients with dementia. Barry et al. also looked at cultural background and where nurses had been trained. The authors concluded that cultural differences play a role in education through norming, setting expectations for practice, and influencing communication style, and role development.

This study is Level 6 evidence on the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). The survey was composed of a standardized survey the Beliefs about Medicine Questionnaire (BMQ), with additional questions created by the investigators. The BMQ section was analyzed using SPSS to capture Chi-squared and Fisher's exact test analysis of correlations

between the different variables. The added questions were open-ended and encoded, however the authors do not indicate how the coding was conducted or how many researchers coded the data for quality assurance. The percent return rate, and wide sampling of all nursing homes in Ireland lend some generalizability for the country.

In 2008, d'Arcy surveyed almost 3,000 working nurses regarding their knowledge and attitudes about pain management. Despite answering questions about pain assessment correctly, comments showed that “many remain misinformed on certain key issues” (d'Arcy, 2008 p. 42). The vast majority of nurses believed that vital signs are a good measure of patients' pain, and many continue to not believe that patients accurately report their pain. Several nurses expressed concern with physicians not prescribing according to protocol, not prescribing enough pain medication for the patient, or prescribing ineffective or wrong medications. The majority of nurses knew believing the patient's self-report of pain was the “right” answer; however narrative responses were often made that revealed their true belief that patients were not to be trusted. Comments made included that the nurse has to figure out the real reason for indicating pain. Certain patients couldn't be believed, and narratives contained pejorative terms typically associated with people with substance abuse disorders. In addition, several nurses expressed concern with physicians not prescribing according to protocol, not prescribing enough pain medication for the patient, or prescribing ineffective or wrong medications.

This study is a level 6 on the Melnyk Pyramid (Melnyk & Fine-Overholt, 2011). There are a number of limitations of the report on the study that may extend to the study itself. The author reported only the number of nurses responding to the survey. How nurses were selected, their location, whether or not a significant sample was calculated, and sample size were not

reported. Methods for analyzing results, controlling for bias, viability or reliability of the survey, and the content of the survey was also not discussed.

Ekim and Ocackci, 2013 utilized the Nurses Knowledge and Attitudes Survey, pediatric version, with 244 nurses in Turkey. The survey was conducted at five pediatric hospitals in Turkey over a three month period. Average age of respondents was 32 years old and most of the nurses were female (89.7%). As in the previous study nurses did not score very well with the highest score being 65%, the mean score was 38%. The vast majority of nurses (85%) scored less than 50%. This study found that BSN nurses scored the highest overall at 41%, however it was not statistically significant compared with MSN nurses. However, BSN and MSN scores were significantly higher than ADN and diploma nurses. Nurses with intensive care experience scored statistically higher than medical and surgical pediatric nurses, despite the study being conducted with nurses caring for pediatric patients. The study found that membership in a professional (nursing) organization did not correlate with higher scores.

This study is level 6 evidence on the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). The authors fail to describe the sampling technique, participation rate, and interviewer experience, preparation, or methods. The study is further limited by the fact that the survey was translated into Turkish, but the authors do not describe how they checked the translation for validity and reliability. The descriptive correlational design cannot establish causality.

Gordon, Pellino, Higgins, Pasero, & Murphy-Ende (2008) conducted an online survey of 602 nurses from two different regions of the United States with two different health systems. The survey provided four vignettes, with seven questions related to opioid titration, along with 15 demographic questions. The largest group of nurses participating in the survey had more than 25 years of experience. The next largest group had five or fewer years of experience. Though

not statistically significant the nurses with fewer than five or more than 25 years of experience had the fewest correct answers on the vignettes, while nurses with 16-25 years scored the highest. Master's level nurses answered the most questions correctly followed by associate and bachelor's degree prepared nurses, however the differences were not statistically significant. Nurses with specialized training in pain management did not score significantly better than nurses without specialty training.

This study is level 6 evidence under the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Limitations of this study include the convenience sample with voluntary participation through email. Nurses less likely to volunteer or with fewer technology skills may have different experiences. Self-reported data with intention focus. Authors created their own survey and piloted with only five nurses. There are reliable assessments that assess this topic, and would make analysis and generalizability stronger. The descriptive correlational design cannot establish causality.

A cross-sectional study of 98 orthopedic and medical hospital nurses in Norway, in 2010, by Krokmyrdal & Andenæs, 2015 used the Nurses Knowledge and Attitudes survey. Inclusion criteria for the study were that the nurse frequently cares for patients who abuse opioids. The study also found that work experience was the only statistically significant factor associated with correctly answering survey questions. Level of nursing education was not statistically significant. Only 22% of nurses were competent in administering opioids to their patients who abused opioids. While the largest group of nurse respondents had two or fewer years of experience working on their units, the majority of the nurses had more than two years of experience.

Thirty-five percent of respondents lacked even basic skills for assessing pain, and 56% stated they could not assess the degree to which a patient with a history of abusing opioids was in pain. Patient self-report of pain was not accepted by two thirds of the nurse respondents as they believed that patients who had abused opioids at some point were likely drug seeking and dishonest. The nurses felt negatively toward these patients and described caring for them as problematic. Nurses state they do not like having these people as patients. The majority of nurses felt that providing opioid pain medication for pain would increase the addiction.

The author's concluded that work experience was the single most important influence on competence, yet work experience as an indicator declined after five years of experience. Part of the study was evaluating where nurses sought information related to pain and opioid pain management. The authors concluded that nurses primarily look to their peers for information, and model their practice on other nurses in the workplace. They found correlation between work experience and unit or facility culture. However, this effect seemed to decline after five years of professional experience. The level of nursing education was not statistically significant in determining competence, and knowledge did not correlate to appropriate pain management. The authors questioned if the pain education and analgesic pharmacology in nursing education was sufficient, as these questions were answered incorrectly by the majority of respondents.

This study is a Level 6 on the Melnyk Pyramid (Melnyk & Fine-Overholt, 2011). Limitations for this study include self-report of data with intention focus versus past behavior or observed behavior. Unit culture appears to be an identified confounder of the study. The study has a small study size, and the authors did not describe how or if they calculated a statistical significance required response. The descriptive correlational design cannot establish causality.

Shrestha-Ranjit & Mathias (2010) conducted a total population sample, retrospective audit of patient charts from 2003-2005 at an urban Australian children's hospital. A total of 106 children 5-15 years old with a broken leg and at least a 24 hour stay were included in the study, with children who spent time in the ICU or had multiple injuries excluded. Only 12% of the time was a pain assessment tool documented in patient charts. Over 75% of the time if a pain score was documented it was an elevated pain score. Children were given only 80% of the PRN codeine ordered, and significantly fewer doses of other opioids (tramadol, oxycodone) ordered.

This study is level 6 evidence under the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Retrospective studies are less reliable than prospective studies. The findings were based on a retrospective audit of medical records rather than a prospective examination of actual pain assessment and management practices. Pain documentation may not reflect practice, or patient pain (Twycross, 2007, Barnett et. al, 2010, McCaffery, Pasero, & Ferrell, 2007). In addition, only one individual coded the chart information leaving more chance of error or bias.

A small but more in-depth study of pediatric nurses in England by Twycross, (2007) utilized a survey design with the Pain Management Knowledge Test. In addition, a trained observer followed each of the 13 nurses on two to four occasions for five hours of their scheduled shift. Notes were documented of patient demographics, statements by the nurse relating to pain, observation of practice and documentation, and assessments utilized for pain assessment.

Findings from the observation notes were that pain was not routinely assessed, and pain assessment tools were not typically used. Nurses did not document or make statements about signals of pain such as behavior change, nor was there regular communication with parents or child about pain. Opioids were withheld until the child was already in pain. Twycross' findings

also supported work experience as a contributor to opioid administration, as nurses with more than 5 years of experience were more likely to give opioids for pain. Nurses with less than 5 years of work experience scored higher on the survey, consulted with the physician, parents, and child about pain, but were less likely to administer opioids. Scores on the survey (knowledge) were not a significant predictor of comfort with administering opioids, as some nurses with high scores were disinclined to give opioids and vice versa. Twycross continues to seek the hidden key in making education translate to practice, and how that factors in to work experience and unit culture.

This study is Level 6 evidence on the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Limitations of the study include the very small sample size, self-reported data in the survey section, selective sampling, and potential study bias during the observation. The descriptive correlational design cannot establish causality.

Twycross & Finley (2014) used the same technique as Twycross et al., 2007 to survey and observe nurses at a Canadian children's hospital. The interaction between 10 patients and 17 nurses were observed with an additional two nurses completing the survey without being observed.

The authors concluded that there were differences in the goals of pain management; nurses' goals were highly subjective, and most failed to act when the patient's stated pain was outside the nurse's goal. Nurse comments during the interview and observation time made assertions about the level of pain a child should experience stated as the goal of their pain management interventions. Some of the nurses didn't specify an actual pain rating on the zero to ten scale, they used more qualitative language. However, they failed to inform the patient what their definition of comfortable was or solicit what number was comfortable for the patient. Even

if a specific number wasn't determined, if a subjective goal is "comfortable", that leaves a lot of room for error. The definition of "comfortable" for the nurses centered on patient behavior and the nurses' belief of what comfortable behaves like. Additionally, when the patient stated their pain was not in line with the nurse's goal, the majority failed to act in many instances. The authors concluded that there was a missing element yet to be measured and hypothesized that it was unit culture stating that health system culture may play a central role in pain management

This study is Level 6 evidence on the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Limitations of the study include the very small sample size, self-reported data in the survey section, selective sampling, and potential study bias during the observation. The descriptive correlational design cannot establish causality.

Voshall, Dunn, & Shelestak (2012) conducted the NKAS with Midwestern nursing faculty. However, more than half (57%) of faculty did not reach the competency score of 80% on the questionnaire. Almost all faculty knew that different classifications of analgesics have different pharmacokinetics, and should be combined to decrease the overall dose of opioids needed, and decrease side effects. Faculty also knew that children are reliable pain reporters, and vital signs cannot be relied on as an indicator of pain. They believed that patients should not be encouraged to handle pain before using or requesting an opioid

In specific pharmacokinetics of analgesics less than 40% knew that over the counter analgesics are effective for bone cancer pain. Similarly the majority were opioids are indicated for pain even when the source of pain is unknown. The authors also found education level and years of teaching were positively correlated. Years of experience in practice, years of teaching, and age were statistically significant, and correlated with the likelihood of having additional pain management training. In contrast being comfortable with teaching pain management was

significantly negatively correlated with having additional training in pain management. Therefore, younger, newer, less experienced, and less educated, but more confident faculty most often taught pain management. Faculty teaching according to pain management clinical guidelines was more likely to have had specific pain management training, and to spend more time teaching pain management in their classes.

This study is level 6 evidence under the Melnyk Pyramid (Melnyk & Fineout-Overholt, 2011). Limitations of this study include the convenience sample from a single region of the United States. The descriptive correlational cannot establish causality.

The Tse and Ho (2012) study was the only quasi-experimental study on the topic of nurses' attitudes, knowledge and beliefs regarding opioid medication administration for pain within the past 10 years found. The McCaffery, Pasero, & Ferrell (2007) study was the next highest level of evidence as a systematic review of primarily descriptive studies. The remaining articles were descriptive studies.

Seven studies reviewed in this literature studied the effect of the level of nursing education and nursing experience. Three of the studies found that five years of experience was a cut-off point for statistical significance of work experience positively impacting pain management (Gordon, et al. 2008; Krokmyrdal & Andaes, 2015; and Twycross, 2007). Krokmyrdal & Andenæs (2015) concluded that the nurses with less than five years of experience scored higher on survey questions. Whereas, nurses with more than five years of experience were more likely to appropriately administer opioid medication in Gordon et al., 2008 and Twycross, 2007. While not identifying five years as being significant, a number of authors concluded that as nursing experience increased, the survey scores decreased (Barry, 2008; Ekim & Ocakci, 2012; McCaffery et al., 2007; Voshall et al., 2011). The seven studies each concluded

that nursing experience and education are not correlated in nurses' analgesic pain management practices, and may be inversely related at times.

Tse & Ho, (2012) and Yin et al., (2015) both concluded that continuing education style pain management training was correlated to increased knowledge regarding analgesic pain management. In addition, these studies looked at increased knowledge short term. However, these studies did not link higher scores with any change in practice.

Five studies addressed attitudes, beliefs, and perceptions of pain and patients (d'Arcy, 2008; Gordon et al., 2008; McCaffery et al.; 2006; Twycross & Finley, 2014; Voshall et al., 2011). Nurses in the study conducted by Twycross & Finley (2014), had the perspective that pain is to be expected, and doesn't need to be extinguished. However, Voshall et al., (2011) found that nursing faculty contradicted the belief of nurses in the study by Twycross & Finley (2014) by stating that patients should not be expected to endure pain.

In d'Arcy, (2008) and McCaffery et al., (2006) nurses' personal beliefs about how a patient looked or behaved or should behave when in pain was the most significant factor in determining opioid dose. Nurses in Gordon et al., (2008) and Krokmyrdal & Andenæs (2015) believed patients' self-report couldn't be believed and the nurses had strong beliefs about the types of patients that couldn't be trusted, including those with mental illness, substance abuse history, and "frequent flyers".

The studies reviewed as part of this project are primarily selective sampled descriptive studies that cannot establish causality. The interest in how nurses treat pain was not limited to the United States. Studies reviewed came from many different countries, continents, and both hemispheres. Four studies were conducted in the United States an additional five studies were conducted in English speaking countries though each study was from a different country

(England, Canada, Northern Ireland, and Australia). Four studies relied on translation of tools, and subsequent translation of responses (Norwegian, Chinese, Japanese and Arabic). Nursing education, continuing education requirements, laws, usual and customary medications, health conditions, and scope of practice vary across these countries, as do cultural expectations, and norms. How this effects nurse administration of opioids needs additional study.

Discussion

Limited use and lack of purposeful inclusion of theory in pain management practice make it more difficult for nurses to reflect on how they provide care. Without a theoretical basis for care there isn't a framework in which to arrange ideas and guidelines to build better practice (Tracy & DiNapoli, 2012).

By embracing the broader and deeper view of care offered by the theory of integral nursing, the nurse and client collaborate in the development of trusting relationships as they intentionally strive to improve client outcomes and ultimately enhance client, nurse, and provider satisfaction with care (Tracy & DiNapoli, 2012 p. 26).

Health is commonly subcategorized into physical, mental, emotional, behavioral, oral, environmental health, etc. but in integral nursing theory health is not broken down this way. Health and the different concepts of health are not separate parts of health, they are health. As discussed in the theoretical framework section the concept of a piece of cloth is helpful in understanding this concept. A single thread is not a cloth, just as thousands of threads are not a cloth. It is the threads, the connections of the threads, the skill of the cloth maker, and its use that make cloth. Therefore, the single concept of opioid pain management is composed of many

threads, and a vast number of connections. This project looked at the nurse's role in opioid pain management and the threads, connections, and quadrants creating that experience.

Individual Internal Factors

In Integral Nursing theory the upper left quadrant is known as the "I" quadrant, and the subjective, personal quadrant. Studies related to the individual interior quadrant contributed evidence on how age, work experience, opinion, and beliefs influenced nurses' treatment of pain. Numerous studies evaluated attitudes, beliefs, and perceptions of pain and patients (d'Arcy, 2008; Gordon et al., 2008; Krokmyrdal & Andenæs 2015; McCaffery et al., 2006; Twycross & Finley, 2014; Voshall et al., 2011). While others examined the individual internal through looking at nursing experience (Barry, 2008; Ekim & Ocakci, 2012; Gordon, et al. 2008; Krokmyrdal & Andaes, 2015; McCaffery et al., 2007; Twycross, 2007; Voshall et al., 2011). Of all the characteristics related to the internal quadrant, nursing experience was the factor most correlated with appropriate pain management practices according to the studies examined.

Individual External Factors

The upper right quadrant is the "It" quadrant. The "It" quadrant is the objective, behavioral, and physical quadrant. Studies related to the individual external quadrant contributed evidence on how specific skills, behavior, and nurses' opioid medication knowledge influences nurses' treatment of pain. Four studies observed nurse behavior when giving opioid medication or reviewed nursing documentation in patient charts related to medication administration and pain assessment (Shrestha-Ranjit & Mathias, 2010; Tse & Ho, 2012; Twycross, 2007; Twycross & Finley, 2014). In addition, every study reviewed during the project identified a knowledge deficit related to opioid administration. No study found nurses performing at a competent (80%) level.

Collective Interior Factors

The lower left quadrant is the “We” quadrant, and the cultural, shared values, and intersubjective. Three studies looked at how peer pressure and unit culture affect nurse opioid administration (Krokmyrdal & Andenæs 2015; Twycross, 2007; Twycross & Finley, 2014).

Collective Exterior Factors

The lower left quadrant is known as the “It’s” quadrant of systems and structures including Nursing education, policy and procedure.

All four quadrants intersect with the finding that nurses’ opioid pain management knowledge is not correlated with pain management practices or behaviors. This manifests through two different factors, though they may be interrelated. One manifestation is beliefs, opinion, and perception about the patient. The other is connected to work experience. As stated above nursing experience was the most consistently correlated factor influencing nurse opioid administration. Nurses are very invested in their experience and their peer’s experience as the guide for practice (Estabrooks, Rutakumwa, O’Leary, Profetto-McGrath, Milner, Levers, & Scott-Findlay, 2005). Nurses will reject advice or recommendations from educators, specialized or advanced practice professionals, clinical guidelines, and evidence-based information if it is contrary to their experience or peer advice. Often nurses consider their experience as highly credible evidence, asserting that through experience they know what actually works and what doesn’t work in practice. A bias exists against theoretical knowledge as just hypothesis by those with education versus experience.

If nurses value their and peers’ experience, and work experience is correlated to practice and knowledge in pain management, then nurse educators, managers, and facility managers need to assure that nurse mentors, preceptors, and nurse managers are practicing according to

evidence-based practice and clinical guidelines (Estabrooks, et al., 2005). This is important for nurse educators, clinical nurse leaders, and clinical nurse specialists in formulating how they practice, and provide expert guidance. If the nurse educator or advanced practice nurse is not viewed as a peer (current practice experience), or is not expert in relating to the unit culture, and not using current practice-based problems with practical solutions, the knowledge to practice transfer is less likely.

Nurses seek out solutions to problems most commonly when they need it, in that moment with a particular patient, for concerns they have not previously experienced (Estabrooks, et. al., 2005). When a nurse seeks out information on pain management for a particular patient, s/he is not likely to be interested in broad generalizations or lengthy theory discussions, but in practical, relatable solutions (Krokmyrdal & Andenæs, 2015). Nurse educators need to be able to instruct, and to teach mentors, and advanced practice nurses how to synthesize the theory, or evidence-based practice into the practical information the nurse needs in that moment, but not disregard the theory. The nurse will need the theory to not only be able to work with the patient to solve the current problem, but provide to provide a framework for the nurse to build on in new situations.

Nurses' opinions, beliefs, and perception of how clients should behave, look, or physiologically respond to pain is the second manifestation. The realization of biases and how it affects both nurse performance, as well as other people takes self-awareness, and practice reflection. Problem-based learning, concept-based curriculum, simulation, clinical rotations, and current methods for educating nurses have been chosen to build nursing judgement. Nursing judgement involves the ability to both consciously and unconsciously observe the whole patient, the environment, interactions with people, and clinical findings while simultaneously

synthesizing observation with knowledge and experience. Therefore, it makes sense that nurse's struggle with placing aside their conscious and subconscious observations to believe the patient's verbalization of pain is the single determinate of pain. Nursing judgement is central to the independent practice of the profession, and should not be disregarded.

This leads to the intersection with the Collective Internal Quadrant. Nurses are affected by peer pressure, and invested in their peers' views of pain management (Krokmyrdal & Andenæs, 2015). Nurses are likely to adopt the practices of other nurses in their work unit. Reflecting on work experience as the strongest statistical factor in determining dose selection, leads to the impact of the specific milieu and competence or quality of the influential nurses in the setting. In relationship to informal relationships versus formal relationships such as mentoring, "Our findings suggest that relying heavily on colleagues for building competence seems to be an incorrect strategy (Krokmyrdal & Andenæs, 2015 p. 791). They cited informal relationships being likely to encourage the status quo. Role models should be the progressive nurses, early adopters of evidence-based practice, willing and skilled at challenging the status quo, and those with commitment to ongoing education in care. Peer coaches with knowledge of nursing theory, and theoretical approaches.

Educators can facilitate nurses learning about bias through the skill of practice reflection. Nurses led by reflective practice have a technique to check their assumptions, and to then build more refined nursing judgement alert to the consequences of bias. Nurse mentors should demonstrate the internal reflection with outward expression when training a new nurse, which means they will need to understand and articulate the process. Nurses can also use outward expression of reflective practice to spark change in colleagues, and physicians. This may decrease the inappropriate pain medication orders that nurses expressed (d'Arcy, 2008).

Nurse Educators can influence the External Collective quadrant with professional development curriculum, facilitating learning on pain management, effective preceptorship, mentoring and coaching, and transformational learning theory. Providing professional development with curriculum and teaching strategies for nurse managers, specialty nurses, and advanced practice nurses that model effective peer education, and theory to practice transformation science. In addition, nurse educators can assist nurse managers and facility administrators in incorporating nursing theory, clinical guidelines, and evidence-based practice in policies and procedures related to pain assessment, pain management, opioid titration, and documentation. Utilization of simulation both high fidelity and basic simulation such as debriefing, and time for reflective practice hold promise as effective interventions (Parker & Myrick, 2010).

Conclusion

Range dosed opioid analgesic orders for acute pain are a frequently used treatment managed by nurses with the desired outcome of tailored pain control. However, too often patients are under-medicated. An understanding of how attitudes, opinions, knowledge and other factors influences nurses to administer a specific dose in the range can help nurse educators understand why this problem has remained persistent.

A review of literature from 2006-2016 using the Integral Theory of Nursing uncovered 13 primarily descriptive study articles that were reviewed for this project. The evidence in the literature was critically analyzed using the Melnyk and Fineout-Overholt scale. Seven concluded that nursing experience and opioid practices did not correlate to level of education. Two studies found that continuing education increases knowledge, but did not study if increased knowledge changes practice. Six studies demonstrated work experience as statistically significant in

knowledge and practice. There are a number of areas for additional study which are outlined below.

Overall, more randomized control studies and quasi-experimental studies to increase the level of evidence available on pain assessment and pain management using opioid analgesics. Additional research looking at pain management practice either in conjunction with knowledge or separate from the potentially idealized answers of practice intention.

Additional research into how nurse expectations change from being taught to be responsive to pain, avoidance of chasing pain, and believing the patient report above behavior and vital signs in nursing education to a suspicious and laissez faire approach in the practice setting. This may lead to a critical breakthrough in teaching pain management that transfers to practice.

More study of self-discovery of bias, and how to change bias and attitudes in practice-based settings. Continued investigation of and with transformational learning theory, and it's potential to change bias, attitudes and practice.

Further investigation into how practicing nurses respond to nurse educators, specialty nurses, and advanced practice nurse experts, and the effect of specialty nurses on unit culture. Study on better ways to incorporate nurse experts; and investigating if current curriculum adequately addresses barriers to effectiveness, with strategies to overcome those challenges.

Health care experts must commit to monitoring not only opioid abuse, and opioid overdose, but the long standing problem of under-treatment of pain. The pharmaceutical and health care community needs to increase commitment and study of new methods and medications to control moderate to severe pain that addresses the dependence risks and adverse events that are linked to opioids.

The Joint Commission, as well as, professional associations need to hold facilities accountable for having and maintaining policies and protocols related to pain assessment, opioid titration, and pain management. Facilities, Boards of Nursing, nurse professional associations, and colleges of nursing need to highlight the importance of continuing education in pain assessment, pain management, opioid management, and facility policies and protocols. Collaborative training with other health care providers should be encouraged to highlight the expertise of each member of the health care team, and to address perceived and real barriers to high quality pain management.

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Attitudes, Beliefs, and Factors Affecting Nurse Opioid Administration

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Problem

Range dosed opioid analgesic orders for acute pain are a frequently used treatment managed by nurses with the desired outcome of tailored pain control.

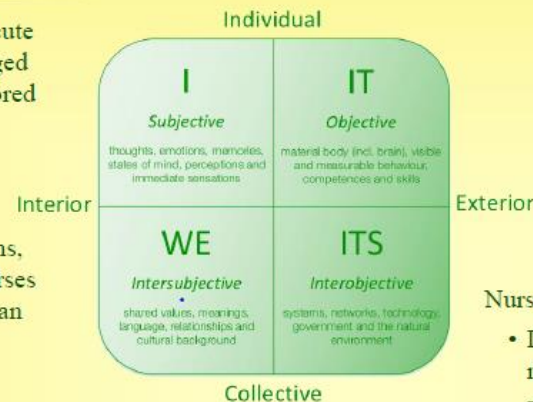
However, too often patients are under-medicated.

An understanding of how attitudes, opinions, knowledge and other factors influences nurses to administer a specific dose in the range can help nurse educators understand why this problem has remained persistent.

Literature Review

A review of literature from 2006-2016 using the Integral Theory of Nursing uncovered 13 primarily descriptive study articles. The evidence in the literature was critically analyzed using the Melnyk and Fineout-Overholt¹ scale.

- Seven studies² concluded that nursing experience and opioid practices did not correlate to level of education.
- Two studies³ found that continuing education increases knowledge, but did not study if increased knowledge changes practice.
- Six studies⁴ demonstrated work experience as statistically significant in knowledge and practice.



Theoretical Framework

Integral Nursing Theory utilizes four quadrants to explain knowledge and experience. The theory further connects knowledge and experience by highlighting the connections between individuals and the environment, while focusing on the individual and environment holistically⁵.

Recommendations for Practice

Nurse Educators:

- Develop and facilitate professional development on pain management, pain assessment, and clinical guidelines.
- Develop, model, and facilitate professional development for nurse managers, advanced practice nurses, and specialty nurses on importance of unit culture, peer mentoring, and learning transformation theory and methods.
- Teach reflective practice skills for assumption and bias self-discovery.

Professional associations and Facilities:

- Policies and protocols for pain assessment and opioid administration
- Continue to research unit culture, and nursing experience as factor in opioid administration.
- Understand the importance of belief in peers, and who is viewed as a peer.

¹Melnyk, B.M. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing and healthcare: A guide to best practice*. Philadelphia: Lippincott, Williams & Wilkins.

²Barry, H. E., Parsons, C., Passmore, P., & Hughes, C. M. (2012). An exploration of nursing home managers' knowledge of and attitudes towards the management of pain in residents with dementia. *International Journal of Geriatric Psychiatry*. 27(12) p 1258 - 1266

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