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Postoperative Pain: Senior Nursing Students' Knowledge and Attitudes Related to Postoperative Pain

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Postoperative Pain: Senior Nursing Students' Knowledge and Attitudes Related to Postoperative Pain

Krystal Whitten

Carroll College
This thesis for honors recognition has been approved for the Department of Nursing.

Director

Date

Reader

Date

Reader
Abstract

Presently, postoperative pain remains inadequately assessed and poorly managed both of which can have a profound impact on the individual's physiological and psychological state, possibly resulting in severe complications or death. The purpose of this research was to identify the knowledge and attitudes of senior nursing students related to postoperative pain and to determine the effectiveness of an educational intervention focused on pain management. The sample consisted of 31 senior nursing students enrolled in a baccalaureate program at a Liberal Arts college in the Northwest, one male and 30 female, ranging in age from 21-49. Data collection took place in the classroom setting. McCaffery and Ferrell's Knowledge and Attitudes Regarding Pain tool was administered before and after the educational intervention. Education about pain assessment and pain management was presented immediately after the pre-test using a power point containing information from current continuing education directly related to the questionnaire. The average score after the educational intervention was 70.2% on the post-test compared to 65.6% on the pre-test. Overall, an increase in scores was present in the responses to 24 of the 40 questions after the educational intervention, while 7 of the 40 remained the same. The remaining nine questions showed a decrease in the number of correct responses. The findings this research indicate that education related to pain management can enhance knowledge of nursing students as well as practicing nurses and should be continually offered to be fully effective.
Acknowledgements

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Dedication

I would like to dedicate this thesis to my cousin, Nicholas Lee Kolstad, my inspiration and hero. No matter how bad the day may be your smile lights up those it touches. I thank God he sent you to our family.
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Chapter I

Senior Nursing Students' Knowledge and Attitudes Related to Postoperative Pain

Every year in the United States, an estimated 73 million individuals undergo surgical procedures. Of these, 80% experience acute post-operative pain, and approximately 20% experience severe pain (Hutchinson, 2007). Presently, postoperative pain remains inadequately assessed and poorly managed both of which can have a profound impact on the individual's physiological and psychological state, possibly resulting in severe complications or death. Effective management of post-operative pain continues to be a problem for nurses as well as other members of the healthcare team. The purpose of this thesis is to better understand the factors related to post-operative pain, the impact it has on individuals, and to explore the knowledge and attitudes of senior nursing students related to post-operative pain.

There are many factors that play a role in the postoperative pain experience. These factors include the following: past experiences, gender, age, culture, what pain means to that individual, as well as psychological factors such as individual coping mechanisms (Mackintosh, 2007). Researchers are also looking at the possibility of a genetic predisposition to both the generation and experience of pain. According to Kehlet, Jensen, and Woolf (2006), "susceptibility to develop neuropathic pain has a strong heritable component, but the genes responsible have yet to be identified" (p. 1621).
Postoperative Pain can negatively affect the individual's mobility and quality of life possibly resulting in pulmonary and thromboembolic complications like deep vein thrombosis (DVT), atelectasis, and pneumonia. In order to prevent and treat such complications, one must be able to adequately assess and implement the proper treatment.

**Physiological impact.** Pain in the surgical patient can adversely affect the return of normal respiratory and gastrointestinal function. Those individuals with unrelieved or under-treated pain are less likely to perform the necessary pulmonary hygiene of coughing and deep breathing, or move easily after surgery (Banks, 2007). The respiratory and gastrointestinal systems are not the only systems affected by unrelieved pain. Unrelieved pain also negatively affects the immune system by increasing the stress response which impedes wound healing and leads to longer hospitalization (Banks, 2007). The cardiovascular system is another major system that can be negatively affected by post-operative pain. According to Vaughn, Wichowski, and Bosworth (2007), complications include the following: hypertension, increased heart rate, arrhythmias, and an increase or decrease in cardiac output.

Procedures performed in an ambulatory outpatient setting are not without the presence of post-procedure pain. According to Banks (2007), "Approximately 40% of surgical patients in ambulatory settings experience moderate to severe post-operative pain" (p. 906). This may result in numerous negative consequences affecting a patient's well-being including the following: (a) severe
pain after discharge, (b) inability to perform activities of daily living, and (c) unplanned hospital readmissions (Banks, 2007).

*Psychosocial impact.* Pain not only affects the individual physically but also affects the individual psychologically. Painful experiences are stored in the cerebral cortex of the brain and can affect the way pain is processed, which can lead to an increase in the individual's response to pain in the future (D'Arcy, 2007). Pain can also increase an individual's level of anxiety which can affect the recovery process. Anxiety can cause psychological symptoms such as lack of concentration, inability to perform simple tasks, and loss of interest in usual roles (Vaughn, Wichowski, & Bosworth, 2007). An individual may also suffer from depression as a result of pain, especially if the pain is chronic. According to Lee, Chan, and Berven (2007), “people with chronic pain have been reported to experience an even higher rate of depression, with a point prevalence rate as high as 30% to 54%” (p. 33). Pain resulting in a reduction of the individual's level of activity can result in negative self-evaluation, negative expectations of the outcome, and cognitive distortions all of which can lead to depression (Lee, Chan, & Berven, 2007).

*Impact on Family and Society*

These physiological and psychological effects of pain not only affect the individual experiencing pain, but may also affect the people around the individual. Another family member may have to assume the role that the individual is unable to perform. If the individual was the provider of income, changes will have to be made in order to provide for the family.
Unrelieved postoperative pain can potentially result in negative consequences for the healthcare system. These include extended hospitalizations, readmission, and decreased patient satisfaction, which may lead to an increase in overall costs and disadvantage in the competitive world of healthcare (Hutchison, 2007).
Chapter II
Review of Literature

The assessment and management of postoperative pain continues to be a problem for healthcare providers as well as the individual. The purpose of this thesis is to better understand the factors related to postoperative pain, the impact it has on individuals, and to explore those treatments that are available to the individual. This section will address current pharmacological and non-pharmacological treatments, the role of the individual, the role of the nurse, as well as various tools used to assess pain in an individual.

Types of Pain

Pain is considered to be a very personal and subjective experience. Although pain has been defined in many different ways, the most widely accepted definition of pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (Mackintosh, 2007, p. 50). There are several types of pain including chronic, noniceptive, inflammatory, and neuropathic.

Chronic pain. Chronic postoperative pain, also known as persistent postsurgical pain, is the “consequence either of ongoing inflammation or, much more commonly, a manifestation of neuropathic pain, resulting from surgical injury to major peripheral nerves” (Kehlet, Jensen, & Woolf, 2006, p. 1618). The pain can vary depending on the type of trauma involved and if it is present for more than three to six months.

Nociceptive pain. Nociceptive pain is one type of pain that can develop.
This occurs when mechanical, chemical, or thermal noxious stimuli activate the high threshold peripheral sensory (nociceptor) neurons (Kehlet, Jensen, & Woolf, 2006, p. 1618). It acts as a signal of the presence of a stimulus and ceases once the activation by the stimulus is removed.

*Inflammatory pain.* Ongoing inflammation can result in inflammatory pain. This is the result of “the release of sensitizing inflammatory mediators that lead to a reduction in the threshold of nociceptors that innervate the inflamed tissue” (Kehlet, Jensen, & Woolf, 2006, p. 1618). Once the inflammation is gone, most often the pain subsides.

*Neuropathic pain.* Damage to the nervous system can lead to neuropathic pain which results when there is injury to the nerves or sensory pathways in the spinal cord or brain. “Damage to the afferent transmission system causes partial or complete loss of input to the nervous system, leading to negative sensory phenomena, such as loss of touch or temperature or pressure sensations” (Kehlet, Jensen, & Woolf, 2006, p. 1618-19).

**Pain Assessment**

Pain assessment is the first step in pain management and relies heavily on the self-report of the patient. Obtaining this self-report becomes increasingly difficult when the individual loses the ability to communicate verbally, especially when it is due to the use of sedative agents, mechanical ventilation, or a change in the level of consciousness. In these instances, behavioral and physiological indicators are especially important assessments of pain. Additional interventions may be required in order to ensure optimal perioperative pain management in
individuals who are critically ill, cognitively impaired, or have difficulty communicating (American Society of Anesthesiologists Task Force, 2004).

Pain assessment tools. Various tools are available to help members of the healthcare team assess pain in individuals. The validity of such tools plays an important role in the accuracy of the pain assessment, especially in individuals who are unable to verbally report pain. In one study, Gelinas et al. (2006) tested the validity and reliability of the Critical-Care Pain Observation Tool (CPOT). The tool, developed in French, consisted of 4 behavioral categories including the following: facial expression, body movements, muscle tension, and compliance with the ventilator for intubated patients or vocalization for extubated patients. The Pain Intensity Descriptive Scale and the Confusion Assessment Method for the Intensive Care Unit were also used in the study. The sample consisted of 105 individuals recovering from cardiac surgery. The procedure involved three testing periods, each consisting of three assessments. The first three were done while the individual was intubated and unconscious. The second set of three was done while the individual was still intubated but conscious. The final set of three was done after the patient was extubated, usually occurring 5 hours after the second testing period. Descriptive statistics were calculated for all variables. Interrater, criterion, and discriminant validity were also examined.

According to the findings of the study, the CPOT was found to be valid. The findings indicate that pain behaviors are observable even if the individual cannot verbally report pain. The results also suggested that regardless of level of consciousness, individuals may demonstrate pain behaviors to a nociceptive
procedure. Therefore, providers should assume that unconscious individuals may have pain, and these individuals be treated the same as a conscious individual when exposed to sources of pain.

The study did have its limitations. One, the data was collected by 2 individuals and more should have been used to test interrater reliability. Second, only 33 of the 105 of the individuals in the study could be included in the unconscious category because all other individuals were classified as conscious. Third, postoperative drowsiness resulted in missing data for some of the individuals. Lastly, individuals undergoing cardiac surgery are considered a relatively healthy ICU group and may not represent most ICU patients (Gelinas et al., 2006). Therefore further studies should be conducted in other ICU populations.

*Intubated individuals.* Gelinas et al. conducted another study, this time on pain assessment and management in critically ill intubated patients. The design of this retrospective study was a descriptive design. Data from the files of 2 specialized healthcare centers, a cardiology/pneumology and a neurosurgery/traumatology center, were reviewed. Fifty-two total medical files were reviewed. Two types of data were collected including the following: general and medical information, and physicians' and nurses' notes on patients' pain. Physicians' notes were clustered into 3 separate categories including nonobservable indicators, observable indicators, and responses to treatment. Nurses' notes were clustered into 2 separate categories: nonobservable indicators and observable indicators. Data on pain management and
reassessment were also gathered.

The results of this study indicated that potential indicators such as a change in vital signs are documented in individuals' medical files. However, the documentation is inadequate or incomplete. A contributing factor to this problem may be the lack of a pain assessment tool. This study had many limitations, one of the biggest being its design. The health professionals' and patients' points of view cannot be as deeply and precisely investigated due to the design of a retrospective study. Second, the instrument used for this research was developed solely for this study and was being used for the first time. Third, the indicators reported in the healthcare professionals' notes are not specific to pain. Finally, the observable indicators addressed in this study were identified as potential pain-related indicators (Gelinas et al., 2004).

**Verbal report of pain.** An individual's verbal report of pain is the most reliable indicator of an individual's pain experience. "It cannot be shared with others in an objective way, but must be communicated in a subjective way-the patient's way" (Bergh, Jakobsson, Sjostrom, & Steen, 2005, p. 352). Due to the subjective nature of pain, there is a greater need for increased knowledge about the ways individuals talk about their pain experience. In a study conducted by Bergh, Jakobsson, Sjostrom, and Steen, the ways older patients talked about their pain experience after hip surgery were examined. Those individuals that were included were 65 years of age or older, able to understand and respond to interview questions, and admitted to the orthopedic ward for a first time hip replacement or the elder care ward for surgical repair of a first time hip fracture.
Sixty individuals met the criteria and were included in the study. The nurse who was caring for the individual decided whether the individual met the criteria and obtained consent to participate in the face-to-face interview used in the study. The participants were asked to rate their pain at rest and with movement using the Verbal Numerical Rating Scale (VNRS). They also completed a Mini-Mental State Examination (MMSE) to measure their cognitive function at the time of the interview.

According to the results of the study, there were four main themes describing ways the older individual discussed their pain experience. These included objectification, compensation, explaining, and existentializing. As a result, pain assessment should focus on more than just the pain intensity rating. "In clinical practice, a great deal of attention is traditionally focused on rating the intensity of the pain, while other dimensions of the pain experience receive little attention or are completely ignored" (Bergh, Jakobsson, Sjostrom, & Steen, 2005, p. 358). Therefore, nurses should remember that the pain assessment involves much more than obtaining a rating of pain intensity. The American Society of Anesthesiologists Task Force on Acute Pain Management suggests that in the geriatric population, "extensive and proactive evaluation and questioning may be necessary to overcome barriers that hinder communication regarding unrelieved pain" (2004, p. 1577).

One limitation of this study was the setting. Not all participants were able to be interviewed in a private room which could have led to the possibility of the individual's restricting the type and amount of information he or she gave the
interviewer. The interviews were also kept short due to the individual's condition.

Non-Opioid Analgesics

Non-opioid analgesics include acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), and aspirin. These drugs may be used alone to treat mild to moderate pain or in combination with opioids for moderate-to-severe pain.

**NSAIDs**. Pharmacological management of mild-to-moderate postoperative pain usually begins with non-steroidal anti-inflammatory drugs (NSAIDs), which have anti-inflammatory, antipyretic, analgesic, and platelet inhibitory effects. The opioid sparing effect of these drugs is beneficial in reducing the dose requirement and side effects of opioids (Chaturvedi & Chaturvedi, 2007). However, NSAIDs should be avoided in those individuals with severe renal failure, peptic ulceration, severe hepatic failure, fluid retention, and ulcerative colitis.

**Acetaminophen**. Acetaminophen is yet another analgesic drug used to manage mild-to-moderate postoperative pain. The drug does not have an anti-inflammatory effect and does not adversely affect platelet function or the gastric mucosa. However, due to the risk of hepatotoxicity, it should be used cautiously in individuals with liver disease, chronic alcohol use, and malnutrition. In healthy adults the dosage should be limited to no more than 4000 mg per 24 hours (Strassels, McNicol, & Suleman, 2005).

**Cyclooxygenase-2 (COX-2) inhibitors**. COX-2 inhibitors are a new generation of NSAIDs. These drugs were formulated to reduce the gastrointestinal side effects of the traditional NSAIDs. Celecoxib is one of the few
COX-2 inhibitors that remain on the market. A Cochrane review (2003) found that a single 200 mg dose of Celecoxib is an effective means of postoperative pain relief and is similar in efficacy to aspirin 600/650 mg and paracetamol 1000mg.

**Opioid Analgesics**

Opioids are administered to those individuals experiencing moderate-to-severe pain. According to Strassels, McNicol, and Suleman, "Opioids are the cornerstone of the analgesic regimen for moderate to severe pain" (2005, p. 1909). Several factors are used in selecting the appropriate opioid and dosage, including severity of pain, inpatient or outpatient setting, route of administration, age of patient, patient preference, efficacy, adverse effects, and cost. The biggest concern surrounding the administration of opioids is the possibility of respiratory depression. Nausea, vomiting, itching, and urinary retention also may occur with the use of opioids. Examples of opioids include morphine and tramadol.

**Morphine.** Morphine is considered the standard of opioid analgesia (Strassels, McNicol, & Suleman, 2005). It has been found to be effective in relieving moderate-to-severe postoperative pain, providing pain relief in 15-30 minutes when given intravenously. Routes of administration include oral, intrathecal, epidural, and as patient controlled analgesia (PCA) by intravenous or subcutaneous infusion. Individuals experience analgesia, euphoria, sedation, and a diminished ability to concentrate.

**Tramadol.** Tramadol is another mu-receptor agonist, but is five to 10 times less potent than morphine. It may be administered orally, intravenously, or
intramuscularly. Advantages when compared to other opioids include absence of depression of ventilation and a low potential for development of tolerance, dependence, and abuse (Chaturvedi & Chaturvedi, 2007).

Alternative Treatments

Alternative and complementary treatments are usually non-invasive and may help decrease the adverse effects of pharmacological treatments. These treatments may be used alone or as an adjuvant to help manage pain.

Transcutaneous electrical nerve stimulation. Transcutaneous electrical nerve stimulation (TENS), a form of electrotherapy, is a controversial complementary and adjunct therapy used to control pain. TENS involves the passage of low-voltage electrical current to electrodes that are placed on the skin. The intensity and frequency of the current depend on the treatment goals and affected area. Many factors contribute to the controversial nature of the therapy. Early publications on TENS were anecdotal or case reports, not randomized controlled studies. The lack of randomized studies has made it difficult to draw conclusions about the effectiveness of TENS. Therefore, multiple studies are being conducted to determine the effectiveness of TENS to treat pain.

Theory of TENS. Several theories are used to explain the mechanisms of action of TENS. The gate control theory is the most commonly used of the theories. According to Rakel and Frantz, "Laboratory studies have shown that TENS decreases activity of noxiously evoked dorsal horn cells when applied to somatic receptive fields by activating large, myelinated primary afferent fibers"
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(2003, p. 455). Studies have also shown that TENS stimulates the release of endogenous opioids. Researchers have identified “an endogenous opioid-dependent mechanism involving the release of endorphins, enkephalins, and dynorphins in the central nervous system” (Rakel & Frantz, 2003, p. 455).

**Gender-Related Differences**

There has been considerable debate about sex-related differences in the perception of pain and susceptibility to opioids. The question of whether or not aging plays a part in these differences is also the subject of considerable debate. Aubrun, Salvi, Coriat, and Riou (2005) conducted a study to test if a significant difference in postoperative pain and morphine consumption exists between men and women. They also examined whether or not the differences are modulated by aging. Nurses in the PACU used the visual analog pain scale (VAS) and a special form for data collection. The nurses also followed protocol for morphine titration, which included the dose of intravenous boluses of morphine, the interval between boluses, the absence of limitation on the total dose, the VAS threshold required to administer morphine, and the criteria to stop titration (Aubrun, Salvi, Coriat, & Riou, 2005). Patients were questioned about the presence of pain after extubation and return of full consciousness and asked to rate the pain on the VAS scale. This was used to determine the titration of morphine. The study excluded those with minor pain (VAS ≤ 30), delirium or dementia, non-French speaking, those who received other analgesics or regional anesthesia due to lack of pain relief with morphine, and those who experienced the occurrence of severe morphine-related side effects. A total of 4317 patients met the
requirements and were analyzed in the study.

According to the results of the study, women had a significantly higher VAS score and required more morphine during intravenous morphine titration in the postoperative period than men. The difference in morphine requirements was an estimated 11%. Another result of the study was the disappearance of the sex-related difference in the elderly, which could be linked to the role of sex hormones. This study has its limitations. First, the VAS only assesses the intensity of the pain and fails to assess the variety of sensations involved. Second, the pharmacogenetics and pharmacokinetics also play a role in the amount of morphine used to alleviate pain. In women, preemptive analgesia, such as oral NSAIDs the day before and day after surgery, may prevent certain chronic pathologic pain states resulting from postoperative pain causing changes in the dorsal horn of the spinal cord (Shaw & Verdier, 2007). According to Auburn, Salvi, Coriat, and Riou, the results may not apply to the postoperative period after pain relief had been obtained by morphine titration (2005).

The Visual Analogue Scale is one of many tools established to assess an individual's pain intensity. The VAS consists of a vertical or horizontal line, with the extremes representing no pain to extreme pain, on which the individual is asked to mark his or her perceived level of pain (Kahl & Cleland, 2005). This continuum design is believed to provide greater sensitivity than the various numerical scales. The simplicity of the tool makes it easier to administer and score. The drawback to this tool is accuracy when used to assess pain in individuals with visual or cognitive deficits. According to Kahl and Cleland, the
“test-retest reliability has been reported to be high for the VAS (ICC=0.71-0.99)” (2005, p. 124). Because the VAS is a self-reported measure, inter-rater and intrarater reliability do not apply to the VAS. In addition to the VAS being reliable in regards to measuring pain intensity, the tool is also found to be valid. "Concurrent validity has been found to be moderate for the VAS (0.71-0.78) when compared with the NPRS” (Kahl & Cleland, 2005, p. 125).

Role of Nurses in Pain Management

Nurses play an important role in postoperative pain management. The approach the nurse takes in managing postoperative pain helps determine the outcome of the individual. In a study done by Dihle, Bjoltseth, and Helseth (2006), there was a discrepancy “between what the nurses said they did and what they actually did in postoperative pain management” (2006, p. 477). The purpose of the descriptive study was to understand the nurse’s role in postoperative pain management and identify any barriers to achieving optimal postoperative pain control. Nine nurses on three surgical wards at two hospitals were interviewed and observed during five different shifts. These were two day shifts, two evening shifts, and one night shift. In order to be included in the study the nurse must have had experience and interest in the topic, and must have been familiar with the pain routines on the ward.

The main finding of the study was a gap between “what the nurses said they did during the interview and what they were actually observed doing” (Dihle, Bjoltseth, & Helseth, 2006, p. 475). The nurses also used different approaches in assessing and managing pain. The most successful approach used was a direct
approach in which nurses used direct and open communication about pain, had high sensitivity to non-verbal expressions of pain, administered drug as prescribed, aimed to prevent pain, and used knowledge about pain management. "An active approach to pain and pain management apparently enhanced successful postoperative pain management, and therefore it could be claimed the key to good alleviation of postoperative pain lies in the ability of nurses to communicate with patients about pain, nurses' attentiveness to patients' signs and nurses' active use of their knowledge about pain" (Dihle, Bjoltseth, and Helseth, 2006, p. 476).

One limitation of this study was that participants did not confirm the accuracy of the observation notes or the interviews. The small number of participants also limits the generalization of the findings. However, each nurse was observed for approximately 40 hours and participants were from two different hospitals. The participants also may have performed differently due to the fact that they were being observed. Observations were done prior to the study with researchers dressed in the normal nursing attire.

According to the American Society of PeriAnesthesia Nurses (ASPAN), preoperatively the nurse should discuss pain and comfort, including the following: information about reporting pain intensity using the scale that is appropriate for the cognitive ability of the individual, the various pharmacological and non-pharmacological pain and comfort measures, the patient's preference for pain and comfort measures, pain relief/treatment goals, as well as any misconceptions that the individual may have about pain and pain management.
(2003). The ASPAN Pain and Comfort Clinical Guideline (2003) also stated that 
the "patient's method of assessment and reporting need to be the same during 
the postoperative continuum of care for consistency" (p. 233-34). In order to 
determine adequate pain management in the postoperative period, the nurse can 
refer back to the pain and comfort assessment, interventions, and outcomes data 
collected in the preoperative phase.

Improving Practice

Clinical guidelines and quality improvement programs play an integral part 
in continuing to enhance the management of postoperative pain. Bardiau et al. 
(2003) conducted a quantitative study evaluating the results of the 
implementation of an acute pain service (APS) by defining quality indicators and 
using quality tools. The study was conducted in a general hospital with 1005 
beds, 240 of which were surgical beds. The process of quality management was 
divided into eight stages spread over the course of three years, and monitored in 
three consecutive surveys. The first, administered from January to June 1997, 
was designed to analyze current practice of pain management. The survey was 
completed by 1304 surgical inpatients who were able to read and understand 
French, older than 15 years old, had normal mental health, and hospitalized for 
elective surgery. The second, administered from February to April 1998, was 
conducted after the implementation of the APS to assess the effect of such 
service. A total of 671 inpatients completed the second survey. The third, 
administered from October to December 1999 and completed by 408 inpatients, 
was conducted to evaluate whether initial improvements were maintained or
expanded with the use of the quality manual that was published and distributed in the PACU and to members of the surgical team in January of 1999 after the results of the survey were obtained.

According to the results of the study, pain relief did significantly improve after the implementation of the APS. A survey was also administered to nurses to evaluate their attitudes and knowledge in regards to postoperative care. The results of this survey enabled a pain management committee (PMC) to make improvements in education for nurses and set up protocol for nursing practice. One area that was not assessed before the implementation of the APS was patient satisfaction; therefore, no conclusion in regards to increased patient satisfaction after the implementation of an APS could be drawn.

Ethical Dilemmas

The ethical problems related to postoperative pain are by no means clearly black or white. Why do clinicians continue to use treatments that do not work on an individual? According to Cahana (2005), "Clinical experience, overreliance on surrogate outcome, adherence to tradition, and the inability to stand idle and do nothing---are but a few" (p. 301). Another problem is accessibility of care. Individuals may not be able to receive certain treatments because the staff is inexperienced or unskilled in that particular procedure or the risks of the procedure may outweigh the benefits for that individual (Harmer, 2002). Are alternative treatments just as effective as traditional forms of treatment? These are just a few of the ethical dilemmas healthcare professionals face in the treatment of postoperative pain.
Pain is a unique, subjective experience that when unrelieved can lead to dire consequences or death. It not only affects the individual, but also affects the public. As steps continue to be made toward effective management of postoperative pain, ethical dilemmas continue to arise.
Chapter III

Methodology

A quasiexperimental design was used to assess the knowledge and attitudes about pain before and after the intervention. One advantage of using this design is that it "allows the researcher to compare the before-and-after scores" (Fain, 2004, p. 205) within the group. For the purpose of this study, this design was used to determine the effectiveness of the educational intervention focused on pain management. The purpose of this research is to identify the knowledge and attitudes of senior nursing students related to postoperative pain.

Sample and Setting

The sample consisted of 31 senior nursing students enrolled in a baccalaureate program at a Liberal Arts college in the Northwest, one male and 30 female, ranging in age from 21-49. The data collection took place in the classroom setting.

Confidentiality

No names or identifiable data was collected. Institutional Review Board approval was obtained. All information was stored in a locked box. Questionnaires were destroyed after the data analysis was completed.

Data Collection

Age and gender were included in the data collection. A survey using a closed questionnaire approach was administered to assess nursing students' knowledge and attitudes about post-operative pain pre-education. Education about pain assessment and pain management was presented immediately after
the pre-test using a power point containing current information directly related to
the questionnaire. The same questionnaire was administered post-education.

Instrument

The questionnaire that was used was McCaffery and Ferrell’s Knowledge
and Attitudes Regarding Pain tool (Ferrell & McCaffery, 2008) that can be used
to assess nurses as well as other healthcare professionals. The tool, developed
in 1987, has been used extensively from 1987-present and tested for reliability
and validity. The content found in the tool was based on the current standards of
pain management according to organizations such as the American Pain Society
and the World Health Organization.

Data Analysis

Descriptive statistics were used to analyze the characteristics of the
sample. The paired t-test was used to determine if there were significant
differences in outcomes between the mean scores of knowledge and attitudes
pre-education and post-education.
Chapter IV

Results

The purpose of this research was to identify the knowledge and attitudes of senior nursing students related to postoperative pain. A quasiexperimental design was used to determine the effectiveness of the educational intervention focused on pain management.

The average score after the educational intervention was 70.2% on the post-test compared to 65.6% on the pre-test. Overall, an increase in scores was present in the responses to 24 of the 40 questions after the educational intervention, while 7 of the 40 remained the same. The remaining nine questions showed a decrease in the number of correct responses.

Table 1 presents the number of senior nursing students responding correctly to each true/false item on the pre-test as well as the post-test. The responses to several of the questions revealed a lack of knowledge in certain areas. Of the 31 participants, only 10 (32.3%) knew that the usual duration of analgesia for 1-2 mg of IV morphine is 4-5 hours (item 8). Two questions (item 14 and 15) revealed a high level of knowledge and all 31 (100%) participants answered these items correctly on both the pre- and post-test.

Table 2 presents the number of senior nursing students responding correctly to each multiple choice item on the pre-test as well as the post-test. Once again, responses to several questions revealed a lack of knowledge in certain areas. Of the 31 participants, only 1 (3.2%) knew that the likelihood of a patient experiencing respiratory depression as a result of receiving opioid
analgesics was less than 1 percent (item 28). After respiratory depression was discussed related to pain management, only 4 (12.9%) of the 31 respondents answered correctly.

Table 3 presents the number of senior nursing students responding correctly to each case-study item. All 31 participants correctly responded by identifying the patient as the most accurate judge of pain intensity (item 31). However, this knowledge was not applied correctly to the case-studies. Of the 31 pre-test responses, 7 participants (22.6%) and 4 participants (12.9%) disregarded the patient’s verbal report. This response did not significantly increase after the educational intervention and respondents still did not accept either patient’s report of pain.

The results of the paired t-test analysis revealed a significant change in 6 of the 40 knowledge and attitude item scores after the educational intervention. Table 4 displays those items in which the difference between the scores of the pre-test and post-test were significant at the 0.05 level. Item 10 and 11 were particularly noteworthy as the differences between the scores were significant at the 0.01 level.
Chapter V

Discussion

The results of this study demonstrated the gaps in the knowledge and attitudes of senior nursing students. This study along with previous studies supports, “the need for more education about how patients may respond differently to pain, especially the fact that some patients find distraction a helpful coping mechanism” (McCaffery, Ferrell, & Pasero, 2000, p. 84). Additionally, the results demonstrate that one brief, educational session is not sufficient.

Study Limitations

The limitations of this study include the use of a convenience sample of senior level nursing students in one specific baccalaureate nursing program. The results obtained cannot be generalized to senior nursing students in other institutions. Participation for this activity was not part of a mandatory class, so level of engagement varied and may have been lessened due to the fact that participants knew that neither the pre-or post-test would not be part of a graded class requirement. The time between intervention and post-test evaluation was approximately five minutes which may not have allowed for knowledge acquisition. The information presented in the power point presentation was from a single internet continuing education course and may not have completely covered every question on the posttest evaluation tool.

Nursing Implications

Results of this study support previous research findings related to inadequate pain management by nurses in the healthcare setting. Professional
nurses must seek the opportunity to gain awareness of current pain management techniques and implement these into their practice in an effort to decrease the pain and discomfort of hospitalized patients.

*Continuing education.* One of the keys to improving patient care is to provide continuous education about pain and pain management. According to Michaels, Hubbartt, Carroll, and Hudson-Barr, (2006) “literature supports that a pain-monitoring program that includes pain education programs for nurses in combination with performance of daily pain assessment results in improved pain communication and documentation”(p. 260). It is not enough to just provide the continuing education but to provide it frequently to increase retention of educational material. According to Lin, Chiang, Chiang, and Chen (2008), “the continuing education course in pain management brought about short-term improvements in the level of knowledge, attitudes, and behaviour of nursing staff, but required ongoing continuation to be fully effective” (p. 2040). Healthcare institutions should strive to provide educational opportunities for their professional nurses in order to improve patient outcomes related to pain and pain management.

*Patients’ rating of pain.* The patients presented in each case-study only varied with respect to their behavior. Andrew was smiling at the time of his pain assessment whereas Robert was grimacing and both of these patients rated their pain level as an 8 out of 10. Student participants continued to rate the patient’s pain based on their own judgment and not on the patient’s verbal report of pain. In general, nurses are taught that the patient is the most accurate judge of the
intensity of pain, however; as previous studies have shown, participants in this study as well as other studies disregarded the patient's pain rating. According to McCaffery, Ferrell, and Pasero (2000), "nurses do not always record in the patient's record the pain rating given by the patient" (p.81). As recommended in previous studies, education needs to be aimed at addressing the magnitude of the nurse's opinion of the patient's pain versus actually recording and acting on how the patient verbally reports pain.
References


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Table 1. Number of Senior Nursing Students Responding Correctly to Each True/False Item on the Knowledge and Attitudes Survey Regarding Pain (N=31)

<table>
<thead>
<tr>
<th>Item (Correct Response)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vital signs are always reliable indicators of the intensity of a patient’s pain. F</td>
<td>96.8%</td>
<td>96.8%</td>
</tr>
<tr>
<td>2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. F</td>
<td>93.5%</td>
<td>88.9%</td>
</tr>
<tr>
<td>3. Patients who can be distracted from pain usually do not have severe pain. F</td>
<td>45.2%</td>
<td>93.5%</td>
</tr>
<tr>
<td>4. Patients may sleep in spite of severe pain. T</td>
<td>32.3%</td>
<td>45.2%</td>
</tr>
<tr>
<td>5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. F</td>
<td>83.9%</td>
<td>87.1%</td>
</tr>
<tr>
<td>6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. T</td>
<td>35.5%</td>
<td>54.8%</td>
</tr>
<tr>
<td>7. Combining analgesics that work by different mechanisms (e.g., combining an anesthetic with an NSAID) may result in better pain control with fewer side effects. T</td>
<td>96.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>8. The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours. F</td>
<td>32.3%</td>
<td>35.5%</td>
</tr>
<tr>
<td>9. Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiators of opioid analgesics. F</td>
<td>32.3%</td>
<td>32.3%</td>
</tr>
<tr>
<td>10. Opioids should not be used in patients with a history of substance abuse. F</td>
<td>61.3%</td>
<td>61.3%</td>
</tr>
<tr>
<td>11. Morphine has a dose ceiling (i.e., a dose above which no greater pain relief can be obtained). F</td>
<td>29.0%</td>
<td>74.2%</td>
</tr>
<tr>
<td>12. Elderly patients cannot tolerate opioids for pain relief. F</td>
<td>93.5%</td>
<td>96.8%</td>
</tr>
<tr>
<td>13. Patients should be encouraged to endure as much pain as possible before using an opioid. F</td>
<td>93.5%</td>
<td>90.3%</td>
</tr>
<tr>
<td>14. Children less than 11 years old cannot reliably report pain so nurses should rely solely on the parent’s assessment of the child’s pain intensity. F</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>15. Patients’ spiritual beliefs may lead them to think pain and suffering are necessary. T</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>16. After an initial dose of opioid analgesics is given, subsequent doses should be adjusted in accordance with the individual patient’s response. T</td>
<td>96.8%</td>
<td>93.5%</td>
</tr>
<tr>
<td>17.Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. F</td>
<td>93.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td>18. Vicodin (hydrocodone 5 mg + acetaminophen 500 mg) PO is approximately equal to 5-10 mg of morphine PO. T</td>
<td>45.2%</td>
<td>71.0%</td>
</tr>
<tr>
<td>19. If the source of the patient’s pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain. F</td>
<td>54.8%</td>
<td>61.3%</td>
</tr>
<tr>
<td>20. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. F</td>
<td>87.1%</td>
<td>67.7%</td>
</tr>
<tr>
<td>21. Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm. T</td>
<td>51.6%</td>
<td>35.5%</td>
</tr>
<tr>
<td>22. Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. T</td>
<td>100.0%</td>
<td>87.1%</td>
</tr>
</tbody>
</table>
Table 2. Number of Senior Nursing Students Responding Correctly to Each Multiple Choice Item on the Knowledge and Attitudes Survey Regarding Pain (N=31)

<table>
<thead>
<tr>
<th>Item (Correct Response)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is oral. <strong>D</strong></td>
<td>35.5%</td>
<td>41.9%</td>
</tr>
<tr>
<td>24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset, such as trauma or postoperative pain is <strong>intravenous. A</strong></td>
<td>80.6%</td>
<td>87.1%</td>
</tr>
<tr>
<td>25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? <strong>B. Morphine</strong></td>
<td>58.1%</td>
<td>74.2%</td>
</tr>
<tr>
<td>26. Which of the following IV doses of morphine administered over a 4 hour period would be the equivalent to 30 mg of oral morphine given Q 4 hours? <strong>B. Morphine 10 mg IV</strong></td>
<td>48.4%</td>
<td>54.8%</td>
</tr>
<tr>
<td>27. Analgesics for post-operative pain should initially be given <strong>around the clock on a fixed schedule. A</strong></td>
<td>83.9%</td>
<td>80.6%</td>
</tr>
<tr>
<td>28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of a new comorbidity is <strong>less than 1%</strong>. <strong>A</strong></td>
<td>3.2%</td>
<td>12.9%</td>
</tr>
<tr>
<td>29. The most likely reason a patient with pain would request increased doses of pain medication is the patient is <strong>experiencing increased pain. A</strong></td>
<td>96.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>30. Which of the following is useful for treatment of cancer pain? <strong>D. All of the above</strong></td>
<td>64.5%</td>
<td>67.7%</td>
</tr>
<tr>
<td>31. The most accurate judge of the intensity of the patient's pain is the patient. <strong>C</strong></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>32. Which of the following describes the best approach for cultural considerations in caring for patients in pain? <strong>C. Patients should be individually assessed to determine cultural influences.</strong></td>
<td>93.5%</td>
<td>90.3%</td>
</tr>
<tr>
<td>33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? <strong>5-15%</strong></td>
<td>51.6%</td>
<td>45.2%</td>
</tr>
<tr>
<td>34. The time to peak effect for morphine given IV is <strong>15 min. A</strong></td>
<td>67.7%</td>
<td>71.0%</td>
</tr>
<tr>
<td>35. The time to peak effect for morphine given orally is <strong>1-2 hours. C</strong></td>
<td>54.8%</td>
<td>48.4%</td>
</tr>
<tr>
<td>36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued. <strong>A</strong></td>
<td>19.4%</td>
<td>29.0%</td>
</tr>
</tbody>
</table>
Table 3. Number of Senior Nursing Students Responding Correctly to Each Case Study Item on the Knowledge and Attitudes Survey Regarding Pain (N=31)

<table>
<thead>
<tr>
<th>Item (Correct Response)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>37a. Andrew is 25 years old and this is his first day following abdominal surgery. As you enter the room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP=120/80; HR=80; R=18; on a scale of 0 to 10 (0=no pain/discomfort, 10=worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain. <strong>Correct Answer is 8.</strong></td>
<td>77.4%</td>
<td>83.9%</td>
</tr>
<tr>
<td>37b. Your assessment, above, is made 2 hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is &quot;morphine IV 1-3 mg q1h PRN pain relief.&quot; Check the action you will take at this time.</td>
<td>22.6%</td>
<td>22.6%</td>
</tr>
<tr>
<td>38a. Robert is 25 years old and this is his first day following abdominal surgery. As you enter the room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP=120/80; HR=80; R=18; on a scale of 0 to 10 (0=no pain/discomfort, 10=worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain. <strong>Correct Answer is 8.</strong></td>
<td>87.1%</td>
<td>90.3%</td>
</tr>
<tr>
<td>38b. Your assessment, above, is made 2 hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is &quot;morphine IV 1-3 mg q1h PRN pain relief.&quot; Check the action you will take at this time.</td>
<td>32.3%</td>
<td>32.3%</td>
</tr>
<tr>
<td>4. Administer morphine 3 mg IV now.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 4. Statistically Significant Change in Knowledge and Attitude Scores after the Educational Intervention

<table>
<thead>
<tr>
<th>Question</th>
<th>Statistically Significant Difference (p&lt;0.05 level)</th>
<th>Statistically Significant Difference (p&lt;0.01 level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Distraction (Item 3)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Substance Abuse (Item 10)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dose Ceiling (Item 11)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Equianalgesic Dosing (Item 18)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Anticonvulsant Use (Item 20)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Opioid Addiction (Item 22)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>