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Nursing Students' Knowledge and Attitudes Regarding Pain and Pain Management

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NURSING STUDENTS' KNOWLEDGE AND ATTITUDES REGARDING PAIN AND PAIN MANAGEMENT

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Abstract

Pain is a universal human experience and is a primary reason people seek health care; however, undertreatment of pain has been reported in the literature as a significant clinical problem for more than three decades. Researchers have concluded that nurses have inadequate knowledge of pain assessment, are misinformed about opioids, and have inappropriate attitudes about pain and pain management that lead to the undertreatment of pain. One question is whether those misconceptions are acquired in nursing school or whether they are present when students enroll in nursing programs. The purpose of this quasi-experimental study was to examine the attitudes regarding pain and pain management among entry-level nursing students. Eighty-nine nursing students were recruited from two baccalaureate nursing programs and divided into control and experimental groups. An educational intervention relating to pain was provided to students in the experimental group. Ajzen's (1991) Theory of Planned Behavior (TPB) served as the theoretical framework to measure attitudes about pain and to predict whether nursing students would administer opioid analgesics to patients experiencing pain. The survey instruments consisted of the Pain Survey and the Pain Management Survey developed by Edwards et al. (2001). Descriptive and inferential statistics were used to analyze and compare pretest and posttest data. Results indicated that students have misconceptions about pain and the administration of opioid analgesics similar to the general population. However, overall attitudes toward pain and pain management were positive. The TPB constructs accurately predicted nursing students' intentions to administer opioid analgesia to patients experiencing pain.

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Chapter 1

Introduction

Pain is a universal human experience and is a primary reason people seek health care (Bonham, 2001; Resnick, Rehm, & Minard, 2001); however, undertreatment of pain has been reported in the literature as a significant clinical problem for more than three decades (Brown, Bowman, & Eason, 1999; Brunier, Carson, & Harrison, 1995; Fosnocht, Swanson, & Barton, 2005; Good, 1999; McCaffery & Ferrell, 1997a; McCaffery & Pasero, 1999; Schafheutle, Cantrill, & Noyce, 2001). Pain is a uniquely personal experience that virtually all people encounter at some point during their lifetime. Despite research that has increased the understanding of pain management and has broadened knowledge of effective methods to assess and manage pain, nurses have not adequately used this knowledge to improve the care of patients experiencing pain (Arnstein, 2002; Brockopp et al., 1998; Carr, 2002).

Historically, nurses have merely aimed to reduce pain rather than totally relieve it (Cohen, 1980; Edwards et al., 2001; Jurgens, 1996; Twycross, 2002) and have been reluctant to administer analgesics, particularly opioids (Brunier et al., 1995; Clarke et al., 1996; Drayer, Henderson, & Reidenberg, 1999; Edwards et al, 2001; McCaffery & Ferrell, 1996; Yates et al, 1998). Nurses' negative attitudes about pain affect the way pain is managed. Researchers found that nurses were overly concerned about the possibility of addiction and thus underestimated patients' pain. (McCaffery & Ferrell, 1996;

Schafheutle, Cantrill, & Noyce, 2001). One can surmise that if pain is underestimated, it is also undertreated.

Statement of the Problem

The duty of health care professionals is to relieve pain and suffering; most pain can be effectively treated and relieved. Nurses have a primary responsibility for assessing pain and for making decisions about pain management. In her seminal work, McCaffery (1972) stated that pain relief was one of the overall goals of nursing interventions. McCaffery (1995) later called nurses the cornerstone of pain management, yet, pain is often inadequately assessed and remains an undertreated symptom of acute as well as chronic conditions (Brown et al., 1999). Nurses' judgments are influenced by their knowledge and attitudes about pain; misconceptions about pain can result in poor pain management (McCaffery & Ferrell, 1996; McCaffery & Pasero, 1999; Twycross, 2002).

The issues surrounding pain undertreatment have received increasing attention in the past decade (Frank-Stromborg & Christensen, 2001). The number of research studies on pain and pain management have almost doubled (Keefe et al., 2002) yet the clinical practices of pain management have not kept pace with research findings (Bonica & Loeser, 2001; Carr, 2002; McCaffery & Ferrell, 1997a). Furrow (2001) stated that pain is undertreated at all levels of health care, a theme that has been repeated by many authors in numerous publications.

Graffam (1990), McGuire (1994), and Zalon (1995) suggested that the inconsistent accuracy of nurses' pain assessments and the subsequent undertreatment of pain was due to nurses' beliefs that they had little or no preparation about pain management in their nursing curricula. Other researchers concurred that inadequate

education was a primary reason for ineffective pain management (Brockopp et al., 1998). One approach to improving education about pain management in nursing curricula is to explore attitudes and misconceptions about pain and its treatment. One might question whether nurses acquire those misconceptions while in nursing school or whether they are present when students enroll in nursing programs.

Attitudes about pain among entry-level nursing students may be similar to those of the general population (McCaffery & Ferrell, 1996). Common misconceptions include beliefs that analgesics are overused, beliefs that pain cannot be totally relieved, and exaggerated fears of addiction (Heye & Goddard, 1999; McCaffery & Ferrell, 1996). Since entry-level nursing students come from the general population, it is possible that they possess little factual knowledge about opioid analgesics or appropriate pain management techniques and have limited clinical experience with patients in pain. Beliefs about pain and suffering would likely be based on cultural stereotypes held by the population at large (Davitz & Davitz, 1981). One approach to improving pain management is to explore attitudes and misconceptions about pain and its treatment so that instruction can be tailored to students' learning needs.

Purpose and Specific Aims of the Study

The overall purpose of this research was to examine nursing students' knowledge and attitudes about pain and pain management. The study elicited information about entry-level nursing students' general knowledge and attitudes about pain and the administration of opioid analgesics for pain management. Pretest attitude scores about pain beliefs and biases were used, in part, to develop a structured educational intervention to dispel misconceptions about pain and present factual information intended to have a

positive effect on students' knowledge and attitudes. In addition, attitude scores were used to predict entry-level nursing students' intention to provide opioid analgesia for patients experiencing pain. The specific aims of this study were:

1. To describe entry-level nursing students' knowledge and attitudes regarding pain and the administration of opioid analgesics for pain management.
2. To compare the differences in pretest scores measuring knowledge and attitudes regarding pain and pain management between two groups of entry-level nursing students.
3. To compare the differences in pretest and posttest scores measuring knowledge and attitudes regarding pain and pain management in an experimental group receiving a structured educational intervention.
4. To compare the differences in posttest scores measuring knowledge and attitudes regarding pain and pain management between a control group and an experimental group receiving a structured educational intervention.
5. To explore the relationship between the demographic variables of gender, age, marital status, educational preparation, ethnicity, and religious preference and the intention to administer opioid analgesics for pain management.
6. To explore the relationship between a) attitudes, b) beliefs, c) subjective norm, and d) volitional control regarding pain and the intention of entry-level nursing students to administer opioid analgesics for pain management. These variables are the constructs of the theoretical model used in this study.

The Challenge of Pain Management

Public opinions about pain and the use of pain relieving medications have shaped attitudes about pain and how it is treated. Pain is often viewed as a necessary part of an illness or condition and its treatment (Furrow, 2001). Many people view pain as a misfortune; they ignore it and "just keep going" (Hart Research Associates, 2003). Ironically, some patients believe that pain is inevitable or to be expected with certain conditions and they may be reluctant to report pain or may believe that pain cannot be totally relieved (McCaffery & Pasero, 1999).

The consequences of unrelieved pain can be devastating. Acute pain that is poorly controlled can contribute to complications such as deep vein thrombosis, infections, sepsis, renal failure, ileus, or pneumonia (AHCPR, 1992a; Arnstein, 2002) as well as a downward spiral of physical and mental symptoms that can ultimately result in chronic pain (Desbiens & Wu, 2000). The cost to human beings is high in that suffering takes a physiological as well as a psychological toll. The harmful effects of pain affect every body system and can contribute to a decline in function. Changes in the nervous system from prolonged pain can make response to analgesics less effective (AHCPR, 1992a; Bonica & Loeser, 2001).

The psychological effects of unrelieved pain include impaired cognitive function, depression, insomnia, fear, hopelessness, and thoughts of suicide (McCaffery & Pasero, 1999). Arnstein (2002) stated that uncontrolled postoperative pain can affect someone's life long after a surgical incision has healed and that if pain persists for a year or more, the majority of patients become disabled. Intractable pain can proceed to depression, alcoholism, and suicide, exacerbating the human toll on not only pain sufferers but also

their families. In essence, continued pain can become the disease rather than merely a symptom (Davidhizar & Bartlett, 2000). Quality of life issues for patients suffering pain have generally been ignored and may have the most deleterious effects of all.

A national Harris public opinion poll, the *National Pain Survey,* found that 25% of Americans suffered from chronic pain for which opioid analgesia was taken; two-thirds of chronic pain sufferers were unable to perform routine daily activities and were unable to work. A significant number of those who took these medications routinely for pain also took other over-the-counter medications to manage the side effects of the opioids (Harris & Associates, Inc., 1999).

A second Harris poll conducted in 2001, *The Attitudes and Beliefs about Over-the-Counter Medications*, found that a majority of Americans took over-the-counter (OTC) medications, most commonly to relieve their pain. One third of the respondents said they took more than the recommended dose believing it would be more effective (Harris & Associates, Inc., 2001).

Other pollsters found a vast majority of pain sufferers resign themselves to the fact that pain is something they have to live with. Results from *A Survey of Pain in America* (Partners Against Pain, 2001) showed most of the respondents had pain that affected them physically and psychologically but were reluctant to discuss their pain and stated that no one believed how much pain they were experiencing. Nearly half of the respondents also feared addiction to pain medication.

A similar poll in 2003, the *Over-the Counter Pain Medication Study* (National Consumer's League, 2003), found that respondents (n = 3547) were twice as likely to take non-steroidal anti-inflammatory drugs (NSAIDs) than either Tylenol or aspirin. Few

of the respondents read the label directions and were significantly more likely to take more than the recommended dose. In addition, many of the respondents mixed NSAIDs with other over-the-counter medications that included similar ingredients. Of concern is that few of those respondents ever discussed side effects with a health care provider. Equally concerning was the finding that 70% of heavy alcohol users—defined by the pollsters as those who consumed at least three alcoholic beverages a day for five or more days a month—used NSAIDs for pain relief and were unconcerned about possible side effects. In this poll, women were more likely to use NSAIDs than men but men were more likely to report they were not worried about serious side effects. Older respondents, those over 65 years of age, were likely to use NSAIDs frequently, nearly a third of them reported using NSAIDs daily, but were more adherent to the recommended dose and believed these drugs were safe.

In a more recent poll (Roper Public Affairs & Media, 2004), 800 adults with chronic pain were contacted by telephone to determine how chronic pain impacted their quality of life. Sixty-one percent of the respondents were women, of those, 53% were over the age of 50. Respondents (76%) indicated they experienced daily pain; nearly half (47%) of them stated their pain was not under control. A large number (75%) reported their pain prevented them from performing their normal activities. Approximately half (51%) of the respondents stated the pain adversely affected their productivity at work, 45% stated pain had an unfavorable effect on personal relationships, and nearly three-quarters said it interfered with their ability to sleep. The researchers indicated that people with chronic pain are just as likely to be taking an OTC medication as well as a prescribed medication. However, 89% also utilized alternative treatments regardless of

the medications they were using in order to obtain relief. A significant number of the respondents (56%) had concerns about the use of pain medications including side effects, addiction, tolerance, interaction with medications taken for other health reasons, and the possibility of having to take pain medications for the rest of their lives. They were hesitant to take opioid analgesics for those same reasons and non-compliance (61%) with the medication regimen was high. For some (24%), the cost of pain relieving medications was an issue due to lack of health insurance and prescription medication coverage.

The pain-related costs to society are staggering in terms of the amount of healthcare dollars spent on treatment, disability, and lost productivity. Fortner et al. (2003) found that the average direct pain-related costs for hospitalized cancer patients in their study was $5,000-10,000 per month. Poorly controlled pain contributes to slower recovery, longer patient stays, and chronic pain syndromes (Desbiens & Wu, 2000). Other researchers reported there are more than 140 million pain related visits to health care providers each year with over $100 billion spent for health related costs (Grant, 1995); more than 21.6 million patients routinely take prescription analgesics, and 76,000 hospitalizations, averaging $20,000 each, result from the use of non-steroidal anti-inflammatory drugs (NSAIDs) taken for pain (Arnstein, 2002; Weavers, 2000). Ferrell (1999) estimated there are 50 million people in this country who are partially or totally disabled by pain, either from a disease condition or as a result of medical treatments. Lost workdays due to uncontrolled pain cost over $50 million a year (Lewis, Heitkemper, & Dirksen, 2004).

Fins (1997) stated "Frequently we forget that it is *people* who become patients, each with a personal history that will richly inform his or her behavior once ill" (p. 169).

Preexisting attitudes influence the person's response to pain and willingness to seek relief. People are generally stoic about their pain and hope that it will go away or that it is not symptomatic of something more serious. Many will tolerate substantial amounts of pain because they are fearful of knowing the underlying cause (Fins, 1997). Some people are reluctant to take opioid analgesics because they believe that if they use them when the pain is not severe, there will not be a dose strong enough later when they might really need it. Others believe that pain should be severe before opioid analgesics are used so they won't become addicted (Diocesan Health Facilities Pain Management Program, n.d.). This belief may also be held by health care providers. Many patients do not receive effective treatment for several reasons: pain management is given a low priority in health care systems, acute pain is not properly diagnosed, exaggerated fears of addiction, and lack of knowledge or use of existing pain management guidelines have been reported (McCaffery & Pasero, 1999).

Anticipation and fear of pain is of primary concern to patients (Good, 1999; Green & Tait, 2002; McCaffery, 1972). A widely accepted definition of pain was formulated by the International Association for the Study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage" (IASP, 1979, p. 279). According to McCaffery and Pasero (1999), nurses, as well as other health care professionals, have cared for patients who reported pain that could not be proven. The challenge for nurses is to accept that pain is a totally subjective experience that can be reported in many ways. McCaffery (1979) coined a definition for clinical use, "pain is whatever the experiencing person says it is and exists whenever he says it does" (p. 8). This definition was incorporated into the Agency for Health Care

Policy and Research (AHCPR) guidelines as an assumption that the patient is the best person to identify the pain experience and that the patient's report should not be doubted (Agency for Health Care Policy and Research [AHCPR], 1992a, 1992b).

An ethical obligation to manage and relieve pain is a core commitment of the nurse (AHCPR, 1992a). A comprehensive approach to pain management includes assessing the patient's perceptions and expectations of pain, physiological and behavioral responses, and attempts the patient has made to manage pain (AHCPR). Pain management is an interdisciplinary effort; however, nurses have the most contact with patients and are responsible for the delivery of prescribed opioid analgesics (McCaffery & Pasero, 1999). Opioid analgesics are the cornerstone of acute pain management but when these drugs are ordered for administration p.r.n. (as needed), more than half of patients will have unrelieved pain due to undermedication (AHCPR). The International Association for the Study of Pain (IASP) published survey findings containing the following statement:

> . . . the conventional "as needed" approach to pain therapy needs to be reassessed, chiefly because there is a time lag between when the medication is needed and when it is administered. For example, the typical patient with postoperative pain waits until pain is moderate to severe before pushing the nurse call button, then waits for the nurse to respond. The nurse assesses the pain, confirms the prescribed medicine and dose, locates the keys to the narcotic closet, draws the medicine into a syringe, finds a witness to discard a portion of the controlled substance (if some remains in the ampule), locks the cabinet, walks back to the patient's bedside, and gives the intramuscular injection. Then the patient waits for

> the medication to take effect before the pain subsides. The cumulative data suggest these time lags significantly lower the proportion of time pain is well-controlled. (International Association for the Study of Pain, 1993, para. 1)

Hospitalized patients need aggressive pain control. The AHCPR (1992a) guidelines state "...pain is easier to prevent than to bring under control, once it has begun" (p. 2).

Pain management was defined in a recent document published by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). The JCAHO guidelines stated that proper pain management was "a comprehensive approach to the needs of patients, residents, clients, or other individuals served who experience problems associated with acute or chronic pain" (Joint Commission on Accreditation of Healthcare Organizations [JCAHO], 2000, p. 3). While most pain management begins with the prescriber, namely a physician, an advanced practice nurse, or physician's assistant, it is the generally the responsibility of the nurse to administer pain medications to patients in the hospital setting. Brown (1997) reported that 89% of nearly 8,000 nurses surveyed considered pain management an ethical dilemma.

Providers express concerns about pain management and the general undertreatment of pain (Ferrell et al., 2001). However, some providers are reluctant to prescribe opioids and are acutely aware that medical regulators scrutinize their prescribing practices related to opioids. The term *opiophobia* (Martino, 1998) was coined to describe prescribers' aversion to providing opioid analgesics to control pain. Members of medical boards know that controlled substances can be overprescribed; however, over-the-counter (OTC) and prescription drugs are more frequently abused than heroin or marijuana (Brockoff, 1998).

A common misconception is that patients will become addicted to opioid analgesics although the risk is very small (AHCPR, 1992a; McCaffery & Pasero, 1999). Fear of addiction is a key contributor to the undertreatment of pain (McCaffery & Ferrell, 1997a; Schafheutle, Cantrill, & Noyce, 2001; Watt-Watson, 1992).

Significance of the Study

Nurses frequently care for patients with pain. Pain is associated with a variety of conditions and is one of the most common reasons patients seek treatment yet many patients do not get adequate pain relief (Allare, Maunsell, Labbe, & Dorval, 2001; Bellinger, Romelfanger, Algren, & Hagan, 1998; Clarke et al., 1996; Hardcastle, 1999). Researchers' explanations for the problem of undertreating pain are two-fold. First, nurses have inadequate knowledge about analgesic use, equianalgesic dosing, dosing schedules, the likelihood of addiction, and the effectiveness of nonpharmacologic interventions (Brown et al., 1999; Good, 1999; McCaffery & Ferrell, 1997b). Second, nurses have inappropriate attitudes and beliefs that pain is overreported, patients are over-reliant on medications, overt signs will be exhibited when pain is present, pain is to be expected with certain diseases or procedures, or nurses may attribute pain to some conditions and not others (Carr, 1997; Brown et al., 1999; Brunier et al., 1995; Good, 1999; McCaffery, Ferrell, & Pasero, 2000).

Acute and chronic pain can be effectively treated with pharmacologic and nonpharmacologic modalities (AHCPR, 1992a; Bonica & Loeser, 2001; Jurgens, 1996; Furrow, 2001), yet consistent findings in the literature revealed the undertreatment of pain as a persistent problem. Much of the nursing literature has focused on nurses' knowledge and attitudes about pain. Researchers concluded that nurses have inadequate

knowledge of pain assessment, are misinformed about opioids, and have inappropriate attitudes about pain and pain management that lead to the undertreatment of pain (Brown et al., 1999; Brunier et al., 1995; Green & Tait, 2002; Horbury, Henderson, & Bromley, 2005; Hunt, 1995; McCaffery & Ferrell, 1997b; McCaffery, Ferrell, & Pasero, 2000; O'Brien, Dalton, Konsler, & Carlson, 1996; Schafheutle et al., 2001).

The AHCPR (1992a) guidelines stated "the single most reliable indicator of the existence and intensity of acute pain—and any resultant affective discomfort or distress—is the patient's self-report" (p. 11). Nurses do not always accept such patient reports. Researchers have identified disparity between nurses' inferences and patients' perceptions of pain and pain relief. Brunier et al., (1995) reported that the nurses in their study believed their assessments of pain were more valid than patients' reports and very few nurses believed that patients could or should be pain-free. In Coyne et al.'s (1999) study, less than half of postoperative patients surveyed reported adequate pain relief. McCaffery and Ferrell (1997a) stated that although there have been moderate improvements in the past few years nurses still have many misconceptions that cause them to doubt patients' reports of pain. In addition, nurses hold negative attitudes about the administration of opioid analgesics (Edwards et al., 2001).

Previous studies found in the literature were deficient in assessing attitudes about pain. Jurgens (1996) stated that attitudes have only been indirectly measured by current research instruments used in nursing studies which primarily elicit knowledge and beliefs. His research focused on the utility of the Theory of Planned Behavior (Ajzen, 1991) in which he investigated the predictors of nurses' intentions to administer morphine to postoperative patients. Attitudes were defined by Fishbein and Ajzen (1975)

as a positive or negative judgment as to whether the intended behavior is good or bad. They further distinguished attitudes from beliefs which they described as cognitive information one has about an object. Two studies were found in the literature that measured nurses' attitudes; both found that nurses' attitudes were a strong predictor of intention to administer opioid analgesia (Edwards et al., 2001; Jurgens, 1996).

The information gathered from this study on nursing students' attitudes toward pain could guide curriculum development to improve the quality of instruction about pain and pain management in nursing curricula. Future clinicians who are knowledgeable and skilled at pain management can improve the outcome of nursing care for patients experiencing pain.

Theoretical Framework

Ajzen's (1991) Theory of Planned Behavior (TPB) was chosen as the theoretical framework for this study. According to this theory, the antecedent to an action (behavior) is intention to perform the action. Intention is determined by an individual's attitude—a personal factor—toward the action and the perception of others' approval or disapproval—a social normative factor—of performing or not performing the action.

The Theory of Planned Behavior (Ajzen, 1991) assumed that most people consider the outcomes of their actions and would decide whether to act based on personal and social normative factors. An additional factor, a person's belief whether the action is or is not under volitional control, also influenced the relationship between intention and action. A favorable attitude, the belief that others would approve of the action and the. perceived ease or difficulty in performing the action, would lead to a strong intention. The likelihood of the individual then performing the action would be high.

The TPB is a revision of Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). The TRA proposed that intention to perform a specific action (behavior) was determined by attitudes toward the action. The cornerstone of the theory was intention—how much people were motivated to act. Intentions were, in turn, determined by attitudes, favorable or unfavorable, toward performing the action as well as perceived social pressures (i.e., subjective norms) to perform or not perform the action. Fishbein and Ajzen viewed most social behavior as volitional and that a person would likely perform the actions he or she intended to perform. Furthermore, the authors posited that people would consider the implications of their actions before they decided to act or not act in a given situation, thus the action was reasoned (Ajzen & Fishbein, 1975).

In their TRA, Fishbein and Ajzen (1975) made a distinction between beliefs and attitudes. Beliefs were defined as the *cognitive* information one had about an object (e.g., person, thing, group, event, or behavior) that was learned through personal experience or by accepting outside information from other sources. These authors described beliefs as relationships between an object and some characteristic or trait associated with the object. The totality of beliefs becomes the basis for attitudes.

Attitudes were defined as the degree to which one had a positive or negative feeling about an object based on the salient beliefs and was an *affective* component of intention. Attitude, then, is a personal determinant of intention. The authors posited that knowledge contributed to the development of beliefs and as one formed beliefs, attitudes were simultaneously formed. Ajzen (2001) stated that negative information had a greater impact on the formation of attitudes than positive information. A second determinant, social influence, referred to the individual's perception of whether or not certain

significant others thought one should perform the action. In other words, social or peer pressure could influence intention. Fishbein and Ajzen (1975) referred to this component as the subjective norm and stated that people would generally intend to do something when they believed that others important to them would approve of the action.

Ajzen's (1991) TPB refined the TRA by adding a third factor to behavioral intention, which was an individual's perceived volitional control to perform the action. Ajzen operationalized volitional control as the ease or difficulty in performing an action and was related to resources and opportunities rather than self-efficacy. He viewed most social behavior as volitional and that a person would likely perform the action he or she intended to perform. An example might be a nurse's decision to administer an opioid analgesic for pain. If the nurse perceived volitional control, the opioid analgesic would be easily retrieved from the narcotic supply and the nurse would administer it to the patient. Conversely, the nurse does not order the medication or the dosage, or, the patient might refuse the medication. In these situations, the nurse may perceive little control despite the intention to medicate.

External variables were also included in the TPB. These variables included personality traits, demographic variables, and broad rather than specific attitudes. Ajzen (1991) stated that these variables only had indirect effects on intentions and actions.

The theory provided a comprehensive model of behavior and suggested that behavior could be predicted from attitudes. If one uses Ajzen's (1991) criteria, the studies measuring attitudes about pain reported in the nursing literature primarily elicit beliefs and are deficient in assessing attitudes. Jurgens (1996) stated that most survey instruments used in those studies measured knowledge but could only indirectly measure

attitudes because no evaluative component existed to measure direct attitudes, the degree to which respondents agreed or disagreed with the survey items. In addition, no predictors of intention were identified in previous research.

Two research studies were found in the literature that examined nurses' knowledge and attitudes about pain and pain management using the TPB. Jurgens (1996) used a vignette that described a patient in pain to elicit nurses' responses regarding pain ratings and whether they intended to administer morphine to the patient. His results supported Ajzen's (1991) theory and demonstrated that attitudes were strong predictors of action. Similarly, Edwards et al. (2001) used the TPB to examine nurses' intentions to administer p.r.n. opioids and found that beliefs and attitudes played a significant role in nurses' intention to administer opioid analgesics to their patients experiencing pain.

Nurses' knowledge and beliefs about pain and pain management have been well studied. However, less is known about nurses' attitudes. In this study, the attitudes and intentions of entry-level nursing students, the future nurses, were evaluated using the TPB and were measured using the criteria proposed by Fishbein and Ajzen (1975). Measurement will be discussed in the methodology section.

Hypotheses

The specific hypotheses, based on review of the research measuring attitudes, are related to pain and pain management and the relationship of attitudes to behavioral intentions toward providing opioid analgesics to patients with pain:

1. There will be no difference in pretest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.

2. There will be a difference between pretest and posttest scores measuring attitudes regarding pain and pain management in the experimental group after receiving a structured educational intervention.
3. There will be a difference in posttest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.
4. There is no difference between the demographic variables of age, gender, marital status, educational preparation, ethnicity, or religious preference and intention to administer opioid analgesics.
5. Intentions to administer opioid analgesia for pain will be correlated with attitudes, subjective norm, and perceived behavioral control, the constructs of the Theory of Planned Behavior.

Definition of Terms

The following operational definitions of the key terms in this study are identified below:

Acute pain: relatively brief pain that remits when healing has taken place (McCaffery & Pasero, 1999; Turk & Okifuji, 2001). Acute pain is generally associated with trauma, acute illness, surgery, burns, or other conditions that are of limited duration. The focus for this study is on acute pain.

Attitude: a learned disposition to respond favorably or unfavorably toward a person, participant, or object (Fishbein & Ajzen, 1975). For example, a nurse who believes that administering opioid analgesics for pain will lead to pain relief will hold a favorable attitude.

Behavior: an overt action that can be observed (Fishbein & Ajzen, 1975). In this study, behavior refers to the administration of opioid analgesics.

Beliefs: the information one has about an object—a person, group, behavior, event, policy, and so on. Beliefs link the object to an attribute—a trait, characteristic, property, or quality; beliefs are in the cognitive domain (Fishbein & Ajzen, 1975). For example, a nurse may believe that opioid analgesics are effective in relieving patients' pain.

Chronic pain: pain that extends beyond the expected healing time and generally lasts longer than three months (Turk & Okifuji, 2001). Chronic pain has been classified into two categories, cancer pain and nonmalignant pain (Furrow, 2001; McCaffery & Pasero, 1999).

Intention: the probability that an action will be taken. Fishbein and Ajzen (1975) identified intention as the linkage of a person to a specific action. Intention is strongly influenced by attitude. For example, the nurse who believes opioid analgesics are beneficial will have a positive attitude toward opioid analgesics and will likely administer them for pain. Intention is the dependent variable in this study.

Knowledge: understanding that is gained through experience or study (American Heritage Dictionary, 1994).

Pain: "Whatever the experiencing person says it is and exists whenever he says it does" (McCaffery, 1972, p. 8). McCaffery's definition will be used in this study and has a nursing/caring orientation toward the patient's response to disease or injury. Her definition has also been incorporated into pain management guidelines for all health care disciplines. The definition used in medicine is more disease/curing oriented and is related to actual or potential tissue damage (Agency for Health Care Policy and Research, 1992).

Pain management: a comprehensive approach to the needs of patients who experience problems associated with acute or chronic pain" (Joint Commission on Accreditation of Healthcare Organizations, 2000). The key in this statement is that the approach to relieving pain is comprehensive, not just pharmacological.

Perceived control: the ease or difficulty in performing a behavior; it is related to external factors such as resources and opportunities (Ajzen, 1991). While Ajzen stated that self-efficacy also had a role, volitional control, in his view, was extrinsic rather than intrinsic. For example, the nurse who intended to administer an opioid analgesic would perceive volitional control if narcotics were accessible, staffing was adequate, and there were no interruptions in the task.

Personal characteristics: gender, age, marital status, educational preparation, ethnicity, and religious preference of the study participants.

Subjective norm: the perceived social pressure and expectations of valued others to perform or not perform a behavior (Ajzen & Fishbein, 1980). For example, if the nurse intended to administer an opioid analgesic, the likelihood of actually doing so would be higher if the nurse perceived that individuals important to him or her, such as colleagues, the patient, and/or the patient's family, approved of that action.

Students: characterized by individuals who are enrolled in a baccalaureate nursing program. Entry-level students in this study will be those enrolled in the early levels of the nursing program.

Assumptions

1. It is expected that participants in the study will have underlying beliefs and attitudes about pain and the use of opioid analgesics to control pain.

2. Ajzen's (1991) Theory of Planned Behavior will appropriately measure attitudes and intentions of nursing students to provide opioid analgesia for patients with pain.
3. Data obtained from the instruments used in the study will reflect accurate measurement of knowledge, attitudes, and intentions of the study participants.
4. Education will improve knowledge and attitudes about pain management.

Review of the relevant literature pertaining to nurses' knowledge and attitudes about pain, current pain management principles, and the role and efficacy of education in correcting misconceptions about pain and pain management is presented in Chapter 2. The focus for this study is the management of acute pain. The methodology for this research is located in Chapter 3. Results of the data analysis are found in Chapter 4.

Chapter 2

Review of the Literature

The major concepts of this study are presented in this chapter. The role of the nurse in pain management, attitudinal barriers to optimal pain relief, and current pain management principles are explored. The role of education in pain management and attitude change is also reviewed. Finally, studies that have used Ajzen's (1991) Theory of Planned Behavior to predict behavioral intention are identified.

Pain Management

Nurses frequently care for patients with pain. Pain is associated with a variety of conditions and is one of the most common reason patients seek treatment yet patients may not obtain adequate relief (Allare, Maunsell, Labbe, & Dorval, 2001; Bellinger, Romelfanger, Algren, & Hagan, 1998; Clarke et al., 1996; Hardcastle, 1999). Bucknall, Manias, and Botti (2001) posited that patients had a right to adequate pain relief and that pain management was a fundamental aspect of patient care. Historically, acute pain had not been adequately managed.

Undertreatment of pain. The undertreatment of pain has been well documented for more than 30 years. Pain is not well managed in many nursing settings. Several studies related to the undertreatment of pain were found in the literature and are cited below.

Researchers studying pain and pain management were influenced, in part, by the classic work of Marks and Sachar (1973) and other early pain researchers (Donovan & Dillon, 1987; Donovan, Dillon, & McGuire, 1987; Jacox, 1979; McCaffery, 1972; Melzack, Abbot, Zackon, Mulder, & Davis, 1987) who documented the prevalence of pain among patients in a variety of clinical settings. Undertreatment of pain has been found in postoperative units (Apfelbaum, Chen, Mehta, & Gan, 1997; Brownfield, n.d.; Coyne et al., 1999; Manias, 2001; Marks & Sachar, 1973; Sherwood, Adams-McNeill, Starck, Nieto, & Thompson, 2000), intensive care units (Dahlman, Dykes, & Elander, 1999; Maxam-Moore, Wilkie, & Woods, 1994), medical units (Desbiens, et al., 1996; Desbiens & Wu, 2000; Dix, Sandhar, Murdoch, & MacIntyre, 2004; Whelan, 2004), emergency departments (Ducharme, 2000; Lewis, Lasater, & Brooks, 1994; Petrack, Christopher, & Kriwinsky, 1997; Schaffler, 1993; Tanabe & Buschmann, 1999; Todd, Deaton, D'Adamo, & Goe, 2000), oncology units (Carr, 1997; Cleeland, Cleeland, Reuvan, & Rinehardt, 1986; Dorrepaal, Aaronson, & Frits, 1989), orthopedic units (Hunt, 1995; Ng, Dimsdale, Shragg, & Deutsch, 1996) and long-term care facilities (Cramer, Galer, Mendelson & Thompson, 2000; Engle, Graney, & Chan, 2001; Ferrell, 2000).

Marks and Sachar (1973) posited that a significant proportion of postoperative patients were undermedicated for pain and reported that 73% of the postoperative patients in their sample experienced moderate or severe pain. More than half of postoperative patients surveyed in more recent studies reported inadequate pain management (Apfelbaum, Chen, Mehta, & Gan, 1997; Brownfield, n.d.; Coyne et al., 1999; Manias, 2001; Sherwood, Adams-McNeill, Starck, Nieto, & Thompson, 2000).

In another study, Maxam-Moore, Wilkie, and Woods (1994) conducted a retrospective chart review of 80 adult patients who had undergone cardiac surgery. Patients were recovered from their surgeries in the intensive care unit (ICU). The authors found that opioid analgesics were infrequently administered; a total average of only 13.9 mg. of intravenous morphine and a total average of only 5 tablets of acetaminophen with oxycodone were given to patients during the first three postoperative days in the ICU after open chest procedures.

Similarly, Dahlman et al. (1999) examined the treatment of pain after thoracic surgery. On the day the study began, nurses ($n = 75$) were educated about the physiology and pharmacology of pain, pain assessment, and strategies for pain treatment. Findings indicated that patients ($n = 41$) reported moderate to severe pain yet the nurses in the sample chose doses of opioid analgesics that were lower than the recommended dose. Interestingly, patients stated they were satisfied with their pain control despite lack of complete pain relief. When asked, the rationale given by the patients for their satisfaction was that they expected pain after surgery and that they did not want to bother the nursing staff asking for medication.

Green and Tait (2002) surveyed healthcare professionals to assess their knowledge and beliefs regarding postoperative pain management. The sample consisted of third and fourth year medical students ($n = 46$), anesthesia house officers ($n = 38$), and post-anesthesia care unit registered nurses ($n = 20$). The questionnaire focused on the general knowledge of opioids and adjuvants, goals for postoperative analgesia, risks and benefits of epidural analgesia and patient-controlled analgesia, and the causes of inadequate analgesia. The authors reported that the respondents had adequate knowledge

about the commonly used opioid analgesics but minimal knowledge of the role of adjuvants. Of surprise to the authors, the majority of respondents reported a goal of adequate pain relief was preferable to absolute and complete pain relief. Respondents also overestimated the risks associated with opioid analgesics. The authors found that fears of opioid side effects might affect the prescribing and delivery patterns of opioid analgesics to postoperative patients.

Pain was also prevalent in patients who were hospitalized for medical conditions. Desbiens and Wu (2000) found that nearly one in six patients hospitalized with serious medical conditions, such as exacerbation of chronic obstructive pulmonary disease, congestive heart failure, and multiple organ system failure, experienced severe pain that occurred at least half of the time. The authors also found that patients' pain was neither routinely monitored nor were there effective protocols to routinely treat pain.

Whelan (2004) interviewed more than 5600 medical patients 30 days after hospital discharge. Fifty-nine percent of the patients reported they had pain while in the hospital, 19% stated pain was moderate but 28% indicated they experienced severe pain. While some of the patients obtained pain relief, 18% stated their pain control was inadequate.

Similarly, acute pain was not well managed in emergency departments (ED) (Ducharme, 2000; Petrack, Christopher, & Kriwinsky, 1997; Rupp & Delaney, 2004; Schaffler, 1993; Tanabe & Buschmann, 1999; Todd, Deaton, D'Adamo, & Goe, 2000) where pain was a common complaint. In one study, Wilson and Pendleton (1989) found that more than half of patients with acutely painful medical and surgical conditions received no analgesics. Lewis, Lasater, and Brooks (1994) found that only 30% of the

patients in their study with acute fractures received analgesics while in the ED. Johnston (1999) reported that pain management was not a priority in treating some patients in the ED who might have other life-threatening conditions. Additionally, some clinicians believed that analgesia altered physical findings that would interfere with making a diagnosis so analgesia was routinely withheld (Brownfield, n.d.; Pasero, 2003; Zimmerman, 2004). Schaffler (1993) studied emergency nurses' decision-making related to pain assessment and intervention and found the participants were influenced by patient behaviors, physiological signs, age, and lifestyle when choosing whether to administer prescribed opioid analgesia and at what dose. Indeed, a significant number of patients may leave the ED with unrelieved pain (Johnston et al., 1998; Tcherney-Lessenot et al., 2003).

Cancer patients also suffered from unrelieved pain. Cleeland, Cleeland, Reuvan, and Rinehardt (1986) stated that most cancer patients should be virtually pain free and that any pain experienced should not be distressing. A study by Dorrepaal, Aaronson, and Frits (1989) found that 55% of cancer patients in their sample reported pain severe enough to interfere with activity and sleep. More than ten years later, Carr (1997) reported that approximately 75% of hospitalized cancer patients experienced moderate to severe pain that was not totally relieved and that the patients were dissatisfied with their pain management.

Responsibilities of the nurse. Nurses are taught to use the Nursing Process, which is a logical sequence of steps to identify patient needs and implement therapeutic interventions (Lindberg, Hunter, & Kruszewski, 1994). The five components of the nursing process are assessment, nursing diagnosis, planning, intervention, and evaluation.

Following these steps for pain management, the nurse would ask the patient about the presence of pain as well as note any physiological or behavioral cues, analyze and draw conclusions about the patient's pain experience, establish pain management goals with the patient, plan the appropriate action, implement the intervention (e.g., administering opioid analgesics), and evaluate the outcome of the intervention and the patient's response.

Nurses have been accustomed to measuring vital signs, namely blood pressure, temperature, respiratory rate, and pulse rate, as part of routine patient assessments. Nearly 10 years ago, the American Pain Society (APS) declared pain to be the *fifth vital sign* to raise awareness of the presence of pain and to provide appropriate pain management (American Pain Society, 1995). Using the premise of pain as the *fifth vital sign*, the JACHO (1999) manual stated that patients have a right to pain relief; pain is to be regularly assessed and aggressively treated.

Many nurses expected visible signs of pain (e.g., elevated vital signs) or certain behavioral expressions (e.g., grimacing, moaning, body movement or nonmovement, or crying) to verify the presence of pain. If these signs were absent, nurses might discount patients' reports of pain or believe that patients with a low tolerance should make a greater effort to cope with pain (McCaffery & Pasero, 1999). Pain is subjective and invisible, yet intensely real to the people experiencing it. McCaffery and Pasero stated nurses were responsible for assessing pain; however, the extent or quality of pain could not be accurately measured by any objective means. Nurses might not accept what patients say about pain and might undermedicate if they believed patients were exaggerating their pain.

Nurses are responsible for assessing patients' complaints of pain and are in the best position to provide effective pain management because of their frequent contact with patients who were hospitalized (Cason, Jones, Brock, Maese, & Milligan, 1999). It is a nursing responsibility to titrate doses and adjust intervals between doses (McCaffery & Pasero, 1999). Opioid analgesics are generally ordered on a p.r.n. basis that could lead to peak and trough serum concentrations and could contribute to inadequate pain relief. Nurses control access to pain medications, including opioids, and often fear overdose, adverse side effects, and addiction (McCaffery & Pasero, 1999; Sherwood et al., 2003). Scherer (2002) summed up the problem of unrelieved pain in this statement, "Decades after the first calls for improved pain management for patients. . . we are still where we've always been with pain management—suspicious, impatient, and ineffective" (p. 2).

Nurses do not always accept patient reports or pain management recommendations such as the AHCPR (1992a & b) guidelines. Disparity between nurses' and patients' perceptions of pain and pain relief is common. Nurse researchers have reported some nurses believed patients exaggerated their pain (Drayer, Henderson, & Reidenberg, 1999), and that patients' reports of pain were not as reliable as the judgments of healthcare professionals (Furstenberg, et al., 1998).

In a recent study, McCaffery et al. (2000) explored nurses' decisions about the assessment and treatment of pain. The study participants (n = 400) were asked to choose opioid analgesic doses for two simulated patients based on observed behaviors and assessment of patients' pain reports. The findings indicated that the nurses' personal beliefs about patient behaviors had the greatest influence when selecting opioid doses to administer. They also supported the premise that nurses discounted patients' reports of

pain and relied on their own interpretations rather than actual patient data. A strength of this study was the size of the data base. The sample included 400 surveys randomly selected from a larger pool of 1,276 surveys from participants in pain workshops presented in 20 locations across the United States. Generalization of the findings was more feasible based on this technique.

Nurses are expected to monitor the outcomes of therapeutic interventions and coordinate the plan of care (Chiu, Trinca, Lim, & Tuazon, 2003; Sloman, Ahern, Wright, & Brown, 2001). McCaffery and Pasero (1999) stated that nurses were also responsible for initiating and reinforcing teaching about the use of opioid analgesics as well as communicating patient needs to other members of the health care team.

Attitudes toward Pain Management

Attitude biases, positive or negative, orient people toward approach or avoidance intentions that are predictive of behavior (Fishbein & Ajzen, 1975). Attitudes develop from learned beliefs and affect judgment and actions. The most frequently described barriers to adequate pain management found in the literature fell into three categories: patient factors, healthcare provider factors, and organizational factors.

First, patient factors were related to low expectations for pain relief, poor communication of needs, general negative attitudes about taking medications, and fears of addiction (Weavers, 2000). Individuals might underreport their symptoms in an effort to be *good* patients. Patients do not want to be stigmatized so many wait until the pain became unbearable before reporting it. Society values stoicism as character building (Davitz & Davitz, 1981). That belief might cause some patients to *grin and bear* pain rather than report it. Language barriers, reluctance to take medication, and beliefs that

pain is to be expected with certain diagnoses were also factors in the underreporting of pain (Sherwood et al., 2003). The public has been bombarded with reports in the media about substance abuse. The anti-drug message in post-modern society reinforced a reluctance to take drugs and raised fears of addiction. Those fears were unfounded; addiction occurred in less than 1% of patients taking opioids for pain (McCaffery & Ferrell, 1997a; McCaffery & Pasero, 1999).

Secondly, barriers attributed to healthcare professionals included inadequate knowledge about the mechanisms of pain, pain assessment techniques, and the use of pharmacological as well as nonpharmacological interventions. Insufficient formal education about pain management was reported in both the medical and nursing literature (Brockopp et al., 1998; Carr, 1997; Coyne et al., 1999; Ducharme, 2000; Frankel, 1998; McCaffery & Ferrell, 1997b). Many nurses considered pain management a low priority in the care of postoperative patients. Sherwood et al. (2003) stated that the mismanagement of pain was so prevalent that it has been declared a medical error.

Lastly, factors within healthcare systems could impede the implementation of sound pain therapies. Low prioritization for pain management, lack of written standards, lack of accountability for documentation of pain interventions, and lack of criteria for quality assurance were cited as barriers (Weavers, 2000). Health care administrators need to place a high priority on comprehensive pain management programs and make a commitment to implementation of current research and therapeutic interventions. This includes resources of personnel and equipment to meet patient needs. Such commitment might help to reduce the costs of patient care and increase patient satisfaction.

Attitudes and Biases toward Patient Characteristics

Nurses' beliefs might bias attitudes about patient characteristics that could interfere with pain assessments and decisions about pain management. Whether patients are stoic or emotive about their pain influences nurses' attitudes about the need for pain relief. McCaffery and Pasero (1999) stated that nurses tended to negatively view patients who frequently reported pain and were prone to labeling them as *demanding* or *complainers*. The authors related this attitude to a strong societal value of high pain tolerance. Pain tolerance, however, varied widely from person to person and could be affected by personal and cultural factors (Bonham, 2001).

Pain is a universal phenomenon but there are individual differences in the perception, expression, and tolerance of pain. As an example, there is growing evidence that men and women experience pain differently (Berkley, 1997; Greenberger, 2001; Grossi, Soares, & Lundberg, 2000; Jackson, Iezzi, Gunderson, Nagasaka, & Fritch, 2002; Nayak, Shiflett, Eshun, & Levine, 2000). Nurses' attitudes and interpretations about reports of pain, particularly related to gender, might influence pain management interventions.

Gender bias. Martin (2000) stated that over the years nurses have reported that, for the same painful condition, "women get Motrin and men get morphine" (p. 77). This statement raised serious questions about gender bias and pain management practices.

In 1992, McCaffery and Ferrell conducted a survey of nurses (n = 362) who attended their pain workshops in five U.S. cities. The purpose of the survey was to learn whether the nurses thought the response to pain was different between men and women. They found, generally, that the nurses believed there *was* a difference. The authors reported that 37% of the nurses in the sample indicated that pain sensitivity was affected

by gender. This belief could lead to overtreatment or undertreatment of pain. Nearly half of the respondents (47%) believed that women tolerated more pain and needed less analgesia. Forty-one percent of the respondents believed that men had greater distress and felt more threatened by pain than women did while more than half (53%) believed men were more likely to underreport pain. Nearly half (48%) of the nurses thought both men and women exaggerated their pain and indicated they might not believe patients' reports. Furthermore, 48% of the nurses believed a woman was more expressive about pain and that if the woman was not expressive, pain might be overlooked and remain untreated.

Vallerand (1995) reported that some nurses believed that women should tolerate more pain and be given smaller doses of analgesics than men. Yates et al. (1998) found that women were more likely to report greater intensity of pain. Agan (2001) found that women with chronic pain received significantly less opioid analgesia for pain management than men. Recent research has found that women suffer more depression and anxiety and that these conditions were associated with increased pain intensity and other symptoms as well as less ability to cope with pain (Fillingim, 2000; Grossi, Soares, & Lundberg, 2000; Sheffield, Biles, Orom, Maixner, & Sheps, 2000; Zeichner, Loftin, Panopoulos, Widner, and Allen, 2000).

Berkley (1997) reviewed a number of psychophysical studies on sex differences in the perception and tolerance of experimental pain. She found that the female participants had lower pain thresholds, higher pain ratings, less tolerance to painful stimuli than males, and tended to report pain in more body regions than males. Other findings included a higher number of pain reports among women, and a number of specific disorders (e.g., migraine headaches, fibromyalgia, irritable bowel syndrome,

gallbladder disease) were more prevalent in women. Disorders more prevalent among men were cluster headaches, pancreatic disease, duodenal ulcers, and ankylosing spondylitis. Berkley stated that women's hormonal status complicated the function and operation of the sympathetic nervous system in that estrogen modulated the effect of opioid analgesia. In a related review, Greenberger (2001) reported studies that concluded the response of men and women to opioid analgesics was gender specific and was likely due to a gene related to pain perception.

Conversely, Hoffmann and Tarzian (2001) analyzed several studies that identified differences in the way that men and women experienced and expressed pain. In the authors' view, biological differences had not been conclusive in explaining differences in pain expression and they suggested that gender socialization and cultural values played a more important role. Differences were found, however, in how pain management differed between men and women with men receiving more opioid analgesics and women receiving more sedatives. The authors explained that women's pain reports were taken less seriously than those of men. Men were more likely to delay seeking treatment, that may have intensified their symptoms, but overall they received more aggressive pain control than women.

Similarly, Celia (2000) found that men received significantly more narcotic analgesics than women during a 3-day postoperative period after coronary artery bypass surgery despite no differences in the amount of narcotic analgesia prescribed for the patients. The author indicated that nurses' attitudes might have reflected beliefs that women were more emotionally expressive about pain and more prone to dramatization

and exaggeration of pain complaints. Research results have suggested that nurses might undermedicate patients' pain overall but particularly among women.

In a recent study by Leveille, Zhang, McMullen, Kelly-Hayes, and Felson (2005), women aged 72 years and older were found to have more widespread musculoskeletal pain than men of comparable ages. Complaints of pain were associated with general health that was self-rated as fair to poor by both men and women in the study. However, women's symptoms were related to body mass index, systolic blood pressure, and depression whereas men's symptoms were related to osteoarthritis.

In another recent study, Aubrun, Salvi, Coriat, and Riou (2005) collected data from 4,317 postoperative patients, 46% of whom were female. The mean score on a visual analog pain scale was significantly higher among women as was the requirement for a higher dose of morphine than for male postoperative patients. The authors found no sex-related differences, however, when patients were over the age of 75 years.

Age bias. Children might be allowed to suffer needlessly from pain because of erroneous beliefs that children, especially infants, do not feel pain. Experts stated that it was unacceptable to not provide analgesics to pediatric patients where adults, under similar circumstances, would get relief (Anonymous, 2001).

Children were often inadequately treated for pain (Ely, 2001; Hamers, Van den Hout, Halfens, Abu-Saad, & Heijltjes, 1997; Jacob & Puntillo, 1999; Manworren, 2000; Vincent & Denyes, 2004). In one study, Boughton et al. (1998) found that children (n = 86) aged 5-17 years received an average of 13 doses of postoperative analgesic medication during an average length of hospital stay of 6.5 days. One-quarter of the

children reported their pain control was only partially effective one hour after administration.

In a study to examine beliefs and perceptions about children in pain, Margolius, Hudson, and Michel (1995) surveyed 222 pediatric nurses. The findings indicated that the nurses with the highest level of nursing education and experience, namely educators and managers, had the highest correlation between beliefs about children's pain and perceptions of effective pain management. Conversely, those with the least nursing education, the nurses who provided the most direct patient care, had the most misconceptions and were much less likely to question their own pain management practices.

McCaffery and Pasero (1999) stated that children manifested few of the pain behaviors nurses expected. As an example, Ely (2001) reported that nurses (n = 16) in her qualitative study reported difficulty in assessing children's pain and found discordance between children's behavior and reports of pain. This finding illustrated how some nurses relied on expected overt pain behaviors to verify the presence of pain rather than accepting self-reports. When an opioid analgesic was ordered p.r.n. for small children who were unable to verbalize their pain, the nurse decided when to administer medication and whether it was effective. Many infants and young children did not receive any opioid analgesics after surgery or other painful procedures, and when used, the dosage was often inadequate (AHCPR, 1992a).

In a study conducted by Hudson-Barr, Duffey, Holditch-Davis, Funk, and Frauman (1998), pediatric nurses were asked to indicate whether they would administer pain medication to postoperative infants using observed behavior as the primary method

to assess infants' pain. Nurses (n = 50) in the sample watched a collection of short videotapes of infants who were filmed one hour after their surgeries. The researchers previously determined the amount and duration of anesthetic and analgesic agents given to each infant and grouped the videotapes into those infants whose medication was still active and those whose medication was likely inactive. The study participants were unaware of the infant group differentiation. The authors found that the majority of nurses (74%) would administer medication to less than 25% of the infants based solely on behavioral cues. The authors emphasized how difficult it was to interpret infants' cues that would indicate the presence of pain.

More recently, Vincent, and Denyes (2004) examined nurses' (n = 67) knowledge and attitudes about pain and the relationships to children's pain relief. While positive relationships were found, of the 117 children who reported pain only 74% of them received analgesia. Nurses in this study administered 37.9% of the opioid analgesic available and a similar percentage of recommended amounts of morphine, codeine, and acetaminophen.

Undertreatment of pain in older adults was also found to be a clinical problem. Inadequate pain management could be the result of nurses' attitudes about decreased perceptions of pain with aging, lack of behavioral indicators of pain, or a change in mental status that challenged nurses' assessments of pain in this group of individuals (Kovach, Griffie, Muchka, Noonan, & Weissman, 2000; McCaffery & Pasero, 1999). Stoicism and communication problems among the elderly can have an effect on patients' attitudes about pain (Brown, 2004) as well as how nurses interpret their pain reports.

Gloth (2000) stated that people over the age of 65 years were more likely to experience chronic pain with less likelihood of obtaining pain relief. Gloth attributed inadequate pain management in this population to lack of attention to thorough pain assessment and a reluctance to administer opioid analgesics for pain not associated with malignancy.

Desbiens, Mueller-Rizner, Connors, Hamel, and Wenger (1997) conducted a longitudinal study to examine the prevalence of pain and satisfaction with pain control in seriously ill medical patients (n = 1,266) over the age of 80. Participants were interviewed during their hospital stay, with follow-up interviews at 2 months and 12 months after discharge. Nearly half (45.8%) of the patients reported severe pain at least half of the time while in the hospital and 12.9% of them were dissatisfied with pain management. At 2 months, the prevalence of persistent pain was strongly associated with the pain the patients experienced while they were hospitalized. Of the study participants (n = 416) who were still living one year after hospital discharge, 53.6% of them reported extremely severe pain that occurred at least half of the time. The authors concluded that elderly patients who experienced unrelieved pain in the hospital were at greater risk for pain at a later time. They also stated that more needed to be done to control pain in this population.

Bergh and Sjöström (1999) found that nurses (n = 39) in their study underestimated the degree of elderly patients' (n = 39) complaints of severe pain and noted disparity between nurses' and patients' ratings of pain tolerance. The investigators conducted patient interviews and had the patients mark their pain level on a visual analogue scale (VAS). Following the interview, nurses assessed the patients' pain

without knowing the VAS pain rating. Nurses tended to rate patients' pain lower than the recorded VAS and rated patients' pain tolerance significantly lower than the patients' self-reports. In this study, nurses tended to overestimate mild pain and underestimate severe pain. Interestingly, the nurses who worked part-time showed a higher correlation with patients' pain ratings than nurses who worked full-time. Other findings showed that nurses with additional education in pain management beyond the basic nursing education also had less discrepancy in pain ratings.

Mrozek and Werner (2001) conducted a descriptive study to identify nurses' (n = 27) attitudes regarding pain assessment and pain management practices in 10 long-term care facilities. More than half of the respondents indicated that elderly residents should be pain free, however, only five of the respondents indicated that pain free meant no pain. Nurses in this study reported that when residents reported pain, pain assessments were conducted by asking about pain and observing behavior. Pharmacological interventions were offered the majority of the time; nonpharmacological interventions were offered only 38% of the time.

Older people were more likely to experience both acute and chronic pain and may have developed more coping strategies than younger people, which may make pain assessments more difficult for nurses (Closs, 1996). Closs found that nurses' ($n = 208$) assessments of pain in the elderly were inaccurate. Nurses in the sample believed that pain was part of the aging process and therefore unavoidable. The nurses also believed that pain sensation was diminished in older adults and that less analgesia should be needed. The nurses expressed fears that the elderly had more side effects from analgesics and perceived patients were at increased risk for respiratory depression with the use of

opioids; therefore, they felt that opioids should be used sparingly. Closs indicated that those beliefs and attitudes could lead to neglect of pain that should be treated.

Pain is not a normal part of aging but many older adults are more likely to have multiple pathologies that led to frequent pain (McCaffery & Pasero, 1999). The American Geriatrics Society Panel on Persistent Pain in Older Persons (2002) advocated the use of the term *persistent* pain, rather than the term *chronic* pain, for older adults experiencing pain. The rationale for this differential was that the term chronic was more closely associated with negative attitudes and stereotypes. While there were multiple causes for pain in the elderly, nurses should include frequent in-depth pain assessments and communicate to patients that pain reports would be heard and acted upon.

Older patients were found to be at risk for undertreatment or overtreatment of pain because nurses had misconceptions about the use of opioid analgesia, including the risk of respiratory depression or addiction (Briggs, 2003; Closs, 1994; McCaffery & Pasero, 1999). Complicating pain management practices were inappropriate attitudes about pain in older adults. Balding, Garcia-Garrett, Reynolds, and Weiss (2003) surveyed nurses in 90 long-term care facilities and found that 45% of the nurses in the sample believed that patients self-reports of pain were inaccurate, 50% believed that patients who had a stroke could not feel pain, and 75% believed that nonpharmacological interventions were ineffective. Alarmingly, 61% of the participants in this study believed older adults should be given placebos to determine if the pain was real. The authors discussed the need for education to correct inappropriate attitudes about pain management in the elderly that created barriers to successful pain relief.

Ethnic bias. Culture has a powerful effect on the perception and expression of pain (Anderson, 2001; Cavillo & Flaskerud, 1993; Lasch, 2000; Ludwig-Beymer, 2003; McCaffery & Pasero, 1999) as well as dictating how to behave when in pain (Zborowski, 1952). People react to pain based on their life experiences and cultural norms; however, minority populations were at higher risk for oligoanalgesia (Bonham, 2001). For instance, Lee, Gin, and Oh (1997) stated that Asians might receive less analgesia for pain not only because of the stoic way in which they endured pain but also because they were more likely to have adverse effects from opioids. Nurses might misinterpret pain verbal and nonverbal cues based on conscious or subconscious attitudes toward people of other cultures. Nurses, who had been socialized to expect certain pain behaviors, needed to examine their own personal beliefs and attitudes about pain in addition to their beliefs about patients' expressions of pain (Ludwig-Beymer, 2003).

Studies showed that ethnic bias toward pain management existed. Goldfrank and Knopp (2000) suggested that most health care providers in the United States were "underexposed to and undereducated in the cultural and ethnic differences in our patients" (p. 80) and that the care of minority patients might be unequal. The following studies illustrated these authors' concerns.

In a pioneering study of culture and pain, Zborowski (1952) studied 103 medical-surgical patients from four cultural groups. He conducted patient interviews and compared pain aspects across the groups. Irish Americans had difficulty expressing their pain and were socially withdrawn. Italian Americans expressed their pain freely, demanded immediate relief, and preferred to be in the presence of others when in pain. Jewish Americans also preferred company and frequently were demonstrative and vocal

about their pain. *Old Americans*, defined as third-generation Americans, could express their pain but displayed little emotion and were socially withdrawn. Zborowski further stated that patients were expected to conform to their cultural norms. However, he also indicated that reactions to pain might not always reflect attitudes toward pain.

In a review of 472 research articles, Bonham (2001) found disparities in the treatment of pain based on race and ethnicity, particularly among Blacks and Hispanics in comparison to Whites. Among the causes of the disparities he identified were paternalism and racism, language and communication barriers, misunderstanding of patients' expressions of symptoms, and inadequate clinical assessments of pain. Bonham summarized the problem of ethnic bias in this statement, "It is a part of our unconscious and conscious lives to treat people who look or speak differently as in fact different from those who look or speak like ourselves" (p. 65). It was therefore important for nurses to be aware of actual and hidden biases that might cause differences in pain management for patients of other cultures and ethnic origins.

Todd, Deaton, D'Adamo, and Goe (2000) reported that, among 238 patients with long bone fractures in an emergency department, Blacks were 66% less likely to receive adequate analgesia than Whites were. These findings were similar to a previous study by Todd, Samaroo, and Hoffman (1993) that indicated less analgesia was provided to Hispanic patients with extremity fractures than for White patients with the same diagnosis.

A similar study published by Ng, et al. (1996) found that Whites (n = 114) consistently received higher doses of analgesics than either Blacks (n = 36) or Hispanics (n = 100) after orthopedic surgery. The authors stated that while there were disparities

between patients' and providers' pain ratings, the providers' ratings of pain were identical for the ethnic groups. This finding led Ng et al. to conclude that ethnic disparities in the provision of analgesics were not in the pain assessments but rather in the decision making process. It was important for nurses who assessed and managed pain to understand that a potential for bias based on ethnic differences might exist and factored in to decisions about pain management.

Finally, a study by Cavillo and Flaskerud (1993) examined nurses' evaluation of pain in 60 Mexican-American (n = 22) and Anglo-American (n = 38) women who had undergone a cholecystectomy. The researchers described both groups of women as having a stoic response to pain. The nurses in the sample (n = 32) were asked to evaluate the patients' pain after the researchers had interviewed the patients and had them complete two pain scales. The pain ratings assigned by nurses were then compared to patients' pain ratings. Findings from the study revealed no statistically significant differences between the two ethnic group's evaluations of their own pain. The nurses, however, evaluated patients' pain to be less than patients' evaluations. The difference was statistically significant. The nurses also judged Anglo-American women, as well as those with higher social class, defined by the authors as level of education, occupation, economic status, and English as primary language, to have greater pain than the Mexican-American women. While comparing pain assessments to actual opioid administration was not part of the study design, the authors assumed that the women with higher pain ratings would receive more attention and better pain management.

Religious bias. Religion provided a framework for beliefs about healing and suffering (Heilman & Witztum, 2000). Religious beliefs and practices might provide meaning for the pain experience and a way of coping with pain.

Patients might have religious beliefs that pain is a form of punishment and that they were expected to suffer. Early Christian beliefs placed strong religious emphasis on Christ's suffering (Rey, 1995). Views of pain were seen as a sign of having been chosen by God and that to suffer as Christ did would make one deserving of heavenly rewards. Acceptance of pain was encouraged; healing would take place through prayer and faith rather than medical treatments. This belief is still held by some religious groups today.

When the meaning of pain became more secularized during the 18th century, it was viewed as a warning sign of bodily harm. Pain intensity was equated to the extent of tissue damage. Many physicians believed it would be better for the person to feel the pain so that it could be observed and better understood. Religion tried to give pain meaning while medicine tried to find a cause and cure (Hardcastle, 1999; Rey, 1995). A belief that pain needed to be fully evaluated before treatment could explain the reason pain medications are withheld from some patients today.

Heilman and Witztum (2000) reported the strategies used by Orthodox Jews to cope with distress. The authors stated that when Jews were suffering, they often expressed themselves in a religious idiom. Religion, in this case, was used to create some meaning around the experience of suffering. Taking medications was viewed as a sign of weakness, Adherence to prayer and religious observances played a more prominent role and Jews were found to be suspicious of medication and feared addiction.

Buddhism is an Eastern religion that provides a unique perspective on pain. Smith-Stoner (2003) reported that Buddhists believed that pain was to be expected as a part of life and, that if experienced in a calm manner, could help them attain a higher level of being. The author also stated that Buddhists were reluctant to accept pain medications, particularly opioids, because they highly valued alertness of the mind and feared that opioid analgesics or other pain medications would cloud their alertness. Instead, they might prefer meditation or chanting to cope with pain.

Rippentrop, Altmaier, Chen, Found, and Keffala (2005) conducted a study aimed at better understanding of the relationship between religion and health. Participants (n =122) were patients with chronic musculoskeletal pain. Religious practices such as prayer, reading religious materials, and meditation were found to be inversely related to physical health. In other words, the worse the patient's condition, the more frequently religious practices were used. The authors also found that spiritual experiences, religious support, and forgiveness were predictors of positive mental health. They concluded that spirituality may have both costs and benefits for health.

Attitudes about the value of suffering could negatively affect patient care. A few clinicians still believe pain has some redeeming value and that emotional reactions to pain are associated with character weakness or lack of willpower (Hardcastle, 1999; Rey, 1995). Nurses who care for patients with pain needed to be sensitive to the complex relationship between religious beliefs, pain expression, and desire for pain relief, and the value that religion had for individuals in coping with pain and suffering.

Unwillingness to believe patients' pain complaints, fears of addiction to narcotics, and issues related to workload were viewed by nurses as barriers to optimum pain relief.

In addition, prior experiences with pain either could positively or negatively affect the way nurses viewed the pain of others (Wessman & McDonald, 1999).

The Research-Practice Gap

Nurses have cared for patients experiencing pain in nearly every clinical setting. Pain accompanies a variety of illnesses, procedures, and conditions and affects patients' quality of life. Knowledge and attitudes regarding pain could significantly influence the treatment of pain and patient outcomes. Based on the literature, nursing practice and nursing education had not kept pace with pain research and established protocols (McCaffery & Ferrell, 1997b).

Extensive pain studies in the 1970s and 1980s resulted in heightened awareness of pain undertreatment and elevated the problem of inadequate management into the public policy arena. In 1986, the U.S. Public Health Service created the Agency for Health Care Policy and Research, which was given the task of preparing pain management guidelines for healthcare providers. The agency's guidelines were published in 1992 and emphasized the need for aggressive pain control. Jacox, a nurse and co-chair of the panel that developed the guidelines, published several articles and books on the responsibility of the nurse in assessing and managing pain. In an article written in the late 1970s, she stated that nurses needed to recognize that pain was a subjective phenomenon and that a verbal report of pain was more reliable than any behavioral or physiological data (Jacox, 1979). That philosophy was reflected in the panel guidelines that stated, "the single most reliable indicator of the existence and intensity of acute pain—and any resultant affective discomfort or distress—is the patient's self report" (AHCPR, 1992a, p. 11).

Pain relief was also a goal of regulatory agencies including the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). The newest JCAHO (1999) accreditation manual clearly stated that pain assessment was a priority and that all patients had a right to pain relief. The American Pain Society (APS) (1995) designated pain as the *fifth vital sign,* stating that it must be given the same important status as other measured and reported vital signs. The APS also established standards for the management of pain. In other words, pain should be routinely assessed and properly managed. The American Nurses Association designated pain management as one of the nursing quality indicators that contribute to patient care outcomes (American Nurses Association [ANA], 1995). Pain was established as a North American Nursing Diagnosis Association (NANDA) diagnosis in the 1970s and still appears in nursing textbooks today (Lewis et al., 2004); pain management and analgesic administration are formally listed as nursing intervention classifications (McCloskey & Bulechek, 1996)

Nurses have a major responsibility for assessing and managing pain, yet unrelieved pain was found to be a significant problem despite continuing research and education for healthcare professionals. Nurse researchers studied various influences on nurses' pain assessment and pain management practices. For instance, Wessman and McDonald (1999) found an inverse relationship between nurses' personal pain experiences and knowledge of treating pain. Also, nurses in their study were inclined to undermedicate.

Brunier, et al. (1995) studied the knowledge and attitudes of nurses (n = 514) about patients with pain. These authors found that nurses' educational levels and country of education were positively correlated with survey scores measuring knowledge and

attitudes about pain. For instance, university-prepared nurses scored higher than non-university-prepared nurses; those educated in North America or the United Kingdom scored significantly higher than nurses educated in the Philippines. Results indicated that the nurses in the sample believed their assessments of pain were more valid than patients' reports. Very few nurses in the sample believed that patients could or should be pain-free. Concerns about addiction or serious side effects were a barrier to administering opioid analgesics for pain management.

Lebovits et al., (1997) surveyed healthcare professionals from departments of nursing, medicine, surgery, pharmacy, and anesthesiology regarding knowledge and attitudes toward the management of pain. A total of 686 professionals responded; more than half were nurses. The authors reported that the level of education and the clinical practice area affected both knowledge and attitudes toward pain and the administration of opioid analgesics. Anesthesiologists had the most liberal approach to pain management while nurses were the most conservative. Of interest was the average score of 56% on the survey items, which indicated significant knowledge deficiencies among all participants related to accepted pain management principles. Respondents indicated their basic level of education regarding pain management as *poor*. Lebovits and colleagues recommended educational interventions as early as possible in the process of professional education and posited that before behavior could be changed, knowledge and attitudes needed to be changed.

Hamers, van den Hout, Halfens, Abu-Saad and Heijltjes (1997) examined differences in levels of expertise among pediatric nurses regarding pain assessments and analgesic administration. The authors concluded there were no differences in assessment

skills, although experienced nurses were more inclined to medicate than were novice or intermediate nurses. This finding had implications for nursing education. Practicing nurses, as well as nursing students, should have appropriate knowledge, not only about opioid agents for pain, but also when to administer opioid analgesics to patients experiencing pain.

Additional factors may have also contributed to nurses' undermedication of pain. Manias, Botti, and Bucknall (2002) studied nurse barriers to pain assessment and management. The researchers conducted twelve field observations of nurse-nurse and nurse-patient activities related to pain. Nurses (n = 12) in the sample provided primary care. Researchers directly observed and audiotaped the interactions. Four major themes emerged as barriers to effective pain management: interruptions of nursing activities related to pain management, nurses' attentiveness to patients' cues of pain, nurses' interpretations of pain, and the demands of other nurses, doctors, and patients that competed for the nurses' attention and time. The authors found there was often a considerable delay between the initial patient request for pain and the actual delivery of the medication. Interruptions consisted of telephone calls, administering medications to other patients, assisting nursing students, and looking for equipment. These were the types of influences that Ajzen (1991) categorized as volitional control; in this instance, the nurses perceived the ease or difficulty in performing the task of administering medication to patients for pain relief when there were competing demands.

Tapp and Kropp (2005) examined pain management practices of nurses (n = 23). The study was conducted in two phases. In Phase 1, participants completed the Nurses Knowledge and Attitude Survey Regarding Pain (McCaffery & Ferrell, 1997c). The

average score was 69%. Nurses in this sample demonstrated greater knowledge of pain assessment than knowledge of analgesics used for pain. Using chart audits, the investigators also reviewed charts ($n = 30$) of patients on their second postoperative day after abdominal surgery. The investigators found documentation lacking for pain assessments and pain goals that were among the JCAHO standards. Subsequently, an educational intervention was planned to improve pain management knowledge and documentation. Phase 2 of the study was conducted 14 months later. An additional 30 charts of postoperative patients were reviewed and compared to the first set. Significant improvement in documentation was noted and the authors suggested that nurses were more consistent in their performance after the focused education.

Numerous studies on pain management have been conducted with registered nurses but few were identified in the literature that examined nursing students' knowledge and attitudes about pain. McCaffery and Ferrell (1996) sampled non-nursing college students enrolled in a history course. Participants in that study made judgments about pain severity based on behavioral observations rather than on the patient's self-report of pain. The students had low expectations for pain relief, reported exaggerated fears of addiction, and held anti-analgesic attitudes. *Just grin and bear it* was the prevailing belief. Entry-level nursing students might hold similar beliefs because they have been enrolled in few, if any, nursing courses and might not have clinical experiences or role models to observe.

McCaffery and Ferrell (1997b) stated that although there had been improvements in pain management over the past few years, nurses still had many misconceptions that

caused them to doubt patients' reports of pain. These findings had strong implications for nursing education.

Nursing Education and Pain Knowledge and Attitudes

Attitudes were formed throughout life and were reinforced through one's perceptions of people and events (Vourakis, 1998). In other words, the role modeling of others has a powerful influence on what one learned as acceptable. Attitudes of nurses about pain might be influenced by socialization and by education. Many nurses developed their attitudes about pain and opioid use in their own families and communities before they entered nursing school (McCaffery & Ferrell, 1996). Primary sources of clinical information about pain management included basic nursing education and peers in the clinical practice setting (Cason, Jones, Brock, Maese, & Milligan, 1999). During formal education and clinical practice, nurses learned to use objective data for making decisions but when it came to clinical pain assessment, they were asked to accept patients' subjective reports. McCaffery and Ferrell (1996) posited that nurses were taught the acute pain model stating that people exhibited behavioral and physiologic signs when they had moderate to severe pain. In the absence of these signs, patients' reports of pain might not be believed.

Davitz and Davitz (1981) extensively researched the roles and reactions of nurses in the relief of patients' physical pain and psychological suffering. These authors stated that nurses' beliefs about pain and suffering were related to their nursing care of patients with pain. The authors indicated that nursing education had a significant impact on students' beliefs. In a longitudinal study, the authors administered a standardized instrument related to suffering and conducted group interviews with nursing students (n =

1014) at various levels of study in six nursing schools as well as nurses (n = 58) who had graduated less than one year prior to testing. All levels of educational institutions were represented. Data were collected at three points during the academic year, early fall, early spring, and late spring. Pain ratings made by first-year students were higher and differed significantly from upperclassmen and graduate nurses. Interestingly, inferences of pain decreased sharply between the fall and spring of the first-year students and then remained level during the remainder of the nursing program and into the first year of clinical practice. Conversely, inferences of psychological distress increased over the duration of the study.

Davitz and Davitz (1981) posited that students became acculturated within nursing education and acquired beliefs through direct instruction and observation of faculty and staff nurse role models. While nursing education could make students sensitive to patients' suffering, it could also be desensitizing to patient's pain. How nurses had been educated in the prior 20 years might have had a major impact on their pain management beliefs, attitudes, and practices. If, as Davitz and Davitz suggested, role models influenced students, then perhaps much of the latest nurses' pain management practices could be attributable to observation and long-held beliefs and attitudes rather than established pain protocols or research evidence.

Pain management is not well covered during the course of professional education. Physicians have the responsibility of prescribing analgesics for patients experiencing pain while nurses have the responsibility of delivering the medications. Ducharme (2000), Frankel (1998), and Green and Tait (2002) stated medical schools had little pain management content as part of the core curriculum. The authors' conclusions were that

lack of formal education led medical students to infer that pain management was not a high priority and that healthcare providers might very well contribute to the undertreatment of pain. Many new doctors were uncomfortable dealing with pain management (Frankel, 1998).

Similarly, Green and Tait (2002) and Zalon (1995), found schools of nursing devoted less than 10 hours to pain content in the entire curriculum. Ferrell, Virani, Grant, Vallerand, and McCaffery (2000) conducted an extensive review of 50 nursing textbooks and reported pain content to be deficient. These authors found that some essential information was either absent or inaccurate. In another study, nursing faculties reported that their schools' education relating to pain was only moderately effective (Ferrell, McGuire, & Donovan, 1993). One could conclude that nurses, as well as physicians, had inadequate knowledge about pain and pain management.

Lasch et al. (2002) conducted a qualitative study to determine why knowledge deficits and inappropriate attitudes toward pain management persisted and how they might be addressed. In-depth interviews were done with undergraduate medical students (n = 11), undergraduate nursing students (n = 13), medical residents (n = 11), graduate nursing students (n = 4), medical faculty and administrators (n = 10), and nursing faculty and administrators (n = 4). Three central themes emerged from the data. First, the respondents viewed the prioritization of pain in curricula as central to knowledge and skill in treating pain. Secondly, both students and faculty indicated they lacked knowledge about pain medication and were anxious about the kinds of pain medication they should administer. Respondents reported they had little or no adequate pain education in the curricula. Thirdly, both faculty and students cited *opioidphobia* (the fear

of administering too much of an opioid analgesic) as a systemic issue in health care. Doctors and nurses, alike, were overly concerned with drug-seeking behaviors and with legal liabilities surrounding the potential for addiction. In this study, respondents alluded to the impact of anti-drug messages in the American culture and the impact of those messages on their own beliefs about opioid drugs.

Education of nurses is also needed in the areas of pain assessment and pharmacology. McCaffery and Ferrell (1997b) reported progress on improvement of nurses' knowledge of pain assessment and management has been slow since their initial studies in the early 1990s. Clearly, based on the work of these authors, continued lack of knowledge was of concern given the amount of research available. Brunier et al. (1995) stated the goal of most nurses in their study was to reduce pain rather than eliminate it. Improving knowledge of pain management goals needed to continue. Of more importance, perhaps, was educating nursing students about the most effective methods of assessment and treatments for pain.

McCaffery and Ferrell (1997b) recommended introducing nursing students to pain management early in the curriculum. Nursing faculties also must be knowledgeable about current pain management. Publishing textbooks with accurate research information took time; however, current information about pain management was readily available from the Internet and other sources.

The IASP (2000) developed curricular outlines on pain for schools of nursing and schools of medicine that can be retrieved from their website free of charge. Also located on the World Wide Web were online continuing education courses related to adult pain assessment (Scheb & Pasero, 2001) and adult pain management (Pasero & McCaffery,

2001). Additionally, the National Foundation for the Treatment of Pain provided multiple links on their website to other pain related resources.

Based on the current research evidence, the mandate for improved pain management practices and education was clear. Basic pain related education in nursing schools was inadequate; minimal pain content was presented to students (Coyne et al., 1999; Francke, Garssen, & Abu-Saad, 1996; Graffam, 1990). In addition, textbooks were not up to date about current pain practices. The acute pain model, which emphasized behavioral and physiological signs as indicators of pain, was commonly taught in nursing schools (Ferrell, Virani, Grant, Vallerand, & McCaffery, 2000; McCaffery & Ferrell, 1996). Faculty knowledge and attitudes about pain also might be less than optimal (Ferrell, McGuire, & Donovan, 1993). Current guidelines for pain management need to be taught and misconceptions should be corrected if pain management practices were to improve. It was imperative that nursing students be properly prepared to assess the complexities of pain reports and to possess the foundational knowledge of pain management essential for making clinical decisions that provided pain relief.

Previous pain education programs for nurses were reported as successful and resulted in improved knowledge and beliefs (Cason, Jones, Brock, Maese, & Milligan, 1999; Howell, Butler, Vincent, Watt-Watson, & Stearns, 2000; Wright & Bell, 2001) as well as nursing practice (Brunt, 2000; Dalton et al., 1996; Jordan, Coleman, Hardy, & Hughes, 1999). However, retention of information and behavior change decreased over time (Dalton et al., 1996; de Rond, de Wit, & van Dam, 2001; Jordan et al., 1999). Interestingly, Knoblauch and Wilson (1999) found pediatric nurses (n = 52) in their study

tended to give postoperative analgesia less frequently after an in-service program than before the program occurred.

Few studies were found in the literature that evaluated attitudes of nursing students. In one study, Arthur (2001) examined attitudes of nursing students ($n = 212$) toward working with patients with alcohol-related problems. The sample consisted of undergraduate students ($n = 144$) and registered nurses ($n = 68$) in a degree-completion program. He used a quasi-experimental, longitudinal design and two instruments to measure knowledge and attitudes about problem drinkers, alcohol-related problems, and the ability to counsel alcoholics. The five-week intervention consisted of tutorials, case studies, and discussions. He found that the educational intervention was successful in favorably influencing the knowledge and attitudes of the students toward problem drinkers. Information was better retained when kept simple and when first person accounts of an experience were added to the content. He also found that the way the message was delivered influenced how the message was received. Data showed a significant improvement in knowledge and attitude scores after the intervention as well as in the participants' beliefs that they could provide brief counseling for a problem drinker. Arthur stated that the problem-based interactive format used in the study was an effective method of learning for nursing students.

Davidhizar and Farabaugh (1994) conducted an exploratory study related to the attitudes of students in a baccalaureate nursing program ($n = 6$) and students in a diploma nursing program ($n = 10$) toward each other. Prior to repeated interventions of exposure to each other, students in both groups had negative attitudes of the other. By arranging

joint clinical experiences, the researchers were able to demonstrate that active collaboration and faculty interventions made a positive difference in students' attitudes.

Owens (1999) conducted a quasi-experimental study designed to explore pain management education among a cross-section of baccalaureate students (n = 126) from five progressive levels within a nursing curriculum. The Nurses Knowledge and Attitudes Survey (McCaffery & Ferrell, 1987) was used to measure knowledge and attitudes related to pain assessments as well as knowledge about pharmacologic and non-pharmacologic interventions. Beginning students in level one were chosen as the control group because they had no prior pain management teaching. As expected, the higher the students' level of education the higher their test scores.

Chuk (2002) studied the accuracy of pain assessments in a group of Chinese senior nursing students (n = 198). The author used clinical vignettes with two patients in each vignette. The nursing students were asked to assess the degree of pain for each patient. Disturbingly, the majority of the participants (59.2%) were dependent on objective signs of pain rather than the patients' subjective reports. This finding reflected the attitude that a nurse was the authority on whether or not a patient was experiencing pain.

Allock and Toft (2003) conducted a longitudinal study that examined the perceptions of nursing students (n = 217) toward the administration of opioid analgesics for pain relief. The authors found that although the students had a more accurate view of the risk of addiction by the end of the first 18 months of study, over half of the students still had exaggerated fears about addiction and were generally wary regarding the use of opioids.

It became clear to the investigator that there is a great need to change the pain related content in schools of nursing. An initial step is to discover the knowledge and attitudes about pain and pain management among nursing students to determine what, if any, misconceptions were held. Then the task is to improve knowledge and change inappropriate attitudes.

Changing Attitudes

Changes in health care necessitated changes in attitudes and behaviors for a number of reasons: disparities between beliefs and actual clinical practice; advances in professional knowledge and technology; research evidence; and political, social, and economic pressures (Ashford, Eccles, Bond, Hall, & Bond, 1999). Each will be briefly discussed.

According to Ashford et al. (1999), there was a mismatch between ideal practice and what was actually practiced, sometimes due to health care practitioners' inability to perceive their own educational needs. Innovations have been slow to be implemented, generally because they require a significant change in behavior or thinking. Newer research raised awareness but skepticism about new research diluted its impact on change. A further problem with research, according to the authors, was lack of synthesis among studies that delayed the implementation of a body of knowledge.

The current emphasis on cost-effective care and bureaucratic impediments (e.g., organizational structure or educational requirements) created multiple external pressures to change but change was not readily implemented. Barriers to change were numerous but the starting point to any change in behavior was to change attitudes (Ashford et al., 1999). Health care providers as well as patients might not want to cooperate with change.

Continuing education has been crucial to changing attitudes and nursing practice according to Ashford and her colleagues.

Attitudes can be resistant to change. Clarke (1999) reiterated Ajzen's (1980) statement that attitudes were learned but tended to be stable and relatively enduring over time. Attitudes were the means by which people negatively or positively judged things in their world. Persuasion, as a form of social influence, was a technique suggested by Clarke to change attitudes. Persuasion aimed to encourage people to reexamine their own attitudes and beliefs. However, she stated that all three components of attitudes must be addressed—*affective*, the feelings and emotions; *cognitive*, the knowledge and thinking; and *behavioral*, the action component. The message must appeal not only to logic but also to emotions. In her discussion, Clarke stated that the use of teaching tactics that induce fear or intimidation could trigger defense mechanisms but suggested that if emotional appeals to change attitudes were to be effective, they must be fairly strong. Along with providing foundational knowledge about pain management to nursing students, educators needed to assess attitudes and could use persuasive techniques to change misconceptions about pain and opioid analgesics.

In one Australian study, Buchbinder, Jolley, and Wyatt (2001) used television and written media to influence beliefs and attitudes about back pain in the general population as well as among general practitioners. Because of considerable media coverage over several months, attitudes were significantly improved among the general population (n = 4730) surveyed about back pain. Physicians (n = 2556) also changed attitudes and made paradigm shifts in the management of back pain. As a result of the study, the number of

worker claims and the rate of medical payments declined. The authors concluded that the altering of societal views was a highly effective and appropriate strategy.

Many authors agreed that pain management education could produce behavior change but such education needed to be continually reinforced (Cason et al., 1999; Clarke et al., 1996; Dalton, Carlson, Mann, Blau, Bernard, & Youngblood, 1998; Knoblauch & Wilson, 1999). Proper education could increase pain knowledge, pain assessment, and pain management. Changing attitudes would be a challenge. Some ingrained beliefs, such as pain as a punishment or pain as a weakness, have persisted over time. However, Howell et al. (2000) concluded that long-term effects of education were not predictable. Despite lack of guaranteed success, educators must continue to try. Brockopp et al. (1998) stated "an upheaval in the way we view comfort vs. cure may be necessary before we can substantially improve the management of pain" (p. 231). In other words, a major paradigm shift was needed about pain management.

Efficacy of the Theory of Planned Behavior

Despite the fact that Ajzen's (1991) Theory of Planned Behavior (TPB) came from the discipline of social psychology, it has been used as a framework for a variety of health related studies predicting behaviors such as exercise behavior (Hausenblas, Carron, & Mack, 1997; Trafimow & Trafimow, 1998), use of physical restraints with older people (Werner & Mendelsson, 2001), breast self-examination (Lammers & Fox, 1991), smoking (Godin, Valois, Lepage & Desharnais, 1992; Hanson, 1997), and postpartum smoking relapse (Gantt, 2001). Criticism came from nurse experts related to borrowing theories outside of nursing but the TPB was considered congruent with

nursing and had been useful in predicting health behaviors (Villarruel, Bishop, Simpson, Jemmot, & Fawcett, 2001).

The TPB had been used in numerous health promotion studies that predicted participants' intentions to perform or not perform particular behaviors. In one example, Fazekas, Senn, and Ledgerwood (2001) recruited university women (n = 187) from a psychology class to complete a series of questionnaires about intentions to use condoms. The mean age of the participants was 20.9 years; all were heterosexual. The researchers used a 7-point semantic scale as a measure of attitudes about condom use. Specific attitudinal variables as well as the effect oral contraceptive use on intentions to use condoms were measured. Data demonstrated that birth control pills and attitudes significantly influenced intentions of the study participants to use condoms with new partners.

Two studies were found that related to nurses intentions to administer opioids for pain relief. Jurgens (1996) studied the utility of the TBP to predict the intentions of practicing nurses in Canada to administer morphine to postoperative patients. Data were retrieved from the author-developed Pain Beliefs Questionnaire and a pain vignette with an attached questionnaire related to the constructs of the TPB that measured attitudes. Internal consistency of the instrument was reported as a coefficient alpha value of 0.83. Jurgens'results generally supported the theory and demonstrated that attitudes were strong predictors of action. For example, nurses (n = 149) in this sample indicated that administering the maximum dose of morphine allowed in the shortest possible interval was not desirable and they were unlikely to do so. Knowledge of narcotics, past pain experiences, and adequacy of documentation was less of a hindrance in providing pain

medication than the amount of time the nurses had to complete their normal duties. Of particular note was that only 3% of the participants indicated that complete pain relief was a goal in pain management.

Edwards et al. (2001) also used the TPB to examine nurses' intentions to administer p.r.n. opioids and hypothesized that perceived control would be the strongest predictor of intention. The target population consisted of nurses stratified from the largest professional nursing organization in Queensland, Australia. Of the nurses who were eligible, 55.75% completed and returned mailed surveys for a total of 446 participants. The largest percentage (29.4%) of respondents worked in surgical nursing units where pain management was a common expectation of nurses' roles. The authors developed the Pain Survey (PS) and the Pain Management Survey (PMS) that collected information about nurses' attitudes toward pain and pain relief based on the constructs of the TPB. Internal consistency of these direct attitude scales was reported as Cronbach's alpha 0.78.

More than half of the respondents in the study by Edwards et al. (2001) gave positive answers to items relating to opioids and patients with pain. However, negative attitudes were also reported that might have influenced nurses' pain management. Nurses (98%) in this sample believed it was desirable for patients to be comfortable; 20% indicated a belief that patients could have inadequate pain relief. In other words, most of the participants believed patients would obtain adequate relief from the pain interventions they provided. As Edwards and her colleagues hypothesized, perceived control influenced ease of administering p.r.n. opioids but, while 84% of the nurses thought it was desirable to give the medications, only 74% of the nurses indicated they intended to do this. Participants perceived their subjective norms to be positive influences but were

more likely to comply with patient requests for pain medication than requests from colleagues or patients' family members. The authors expressed general support for the predictive ability of the TRB and suggested that educational programs be broad based in order to change subjective norms and attitudes.

Summary

In summary, it was apparent from the research that the undertreatment of pain remains a clinical problem. Several authors stated the problem lies, in part, with nurses' inadequate knowledge and inappropriate attitudes about pain and pain management. Education related to pain management is needed. As previously stated, an aim of this research is to examine the attitudes of nursing students about pain and the administration of opioid analgesia. Ajzen's (1991) Theory of Planned Behavior has been shown to be an appropriate framework for use in nursing to predict behavioral intentions based on attitudes. A short-term goal for this study is to provide factual education to study participants that can dispel misconceptions about pain. A long-term goal is to prepare clinicians who will be knowledgeable and skilled at pain assessment and pain management.

Chapter 3

Methodology

The study design, sample population, instruments, data collection procedures, and the data analysis plan are described in this chapter. In addition, issues related to human participants, confidentiality, potential risks, and study limitations are discussed.

Research Design

The research design was quasi-experimental. The purpose of the study was to examine the knowledge and attitudes of nursing students about pain and to predict their intention to administer narcotic analgesia for pain management. Study participants were divided into control and experimental groups. The experimental group was given a structured educational intervention related to pain and pain management. Two surveys, the Pain Survey (PS) and the Pain Management Survey (PMS) developed by Edwards et al. (2001) were administered three times for the experimental group and twice for the control group over the course of an academic term.

Sample

Convenience samples were obtained from entry-level nursing students enrolled in baccalaureate nursing programs at two universities in the Pacific Northwest. Students at one university were assigned to the experimental group and participated in an educational intervention about pain and pain management. The students at the second university were assigned to a control group. The advantage of this sampling technique was the

accessibility to entire cohorts of students at a specific level in the two nursing programs and dividing the sample into experimental and control groups. Major disadvantages were the inability to objectively assess representativeness or to control for unintentional biases (Burns & Grove, 2001). Convenience sampling is the most frequently used technique in nursing research (Nieswaidomy, 2002) but is also a weak technique (Polit & Hungler, 1993).

All students in the sample were capable of reading and understanding English. This was important because the survey instruments were lengthy and required understanding of the concepts being measured.

To determine the sample size needed for the study, Cohen's method was used as an approximate measure. For a two-tailed *t*-test with a power of .80, a medium effect size of .60, and an alpha level of .05, the number of participants required in each group was determined to be 35 (Munro, 2001).

Setting

Data collection for pretests and posttests took place in classrooms in the nursing departments of the respective universities. A classroom was also used for the structured educational intervention for the experimental group.

Instruments

The demographic portion of the questionnaire elicited information about age, gender, marital status, educational preparation, ethnicity, and religious preference (see Appendix A). Two self-reporting instruments were used for data collection. The Pain Survey (PS) and the Pain Management Survey (PMS) were developed by Edwards et al. (2000) for their study of nurses' intentions to administer opioids for pain relief. The PS

(see Appendix B) is a 56-item instrument that measures general attitudes about pain. The PMS (see Appendix C) consists of 39 items to measure general attitudes about pain management and intention to administer opioid analgesics. The responses to the survey items were measured on a 7-point Likert scale. Edwards et al. used this method for measurement techniques as recommended by Fishbein and Ajzen (1975) to measure the degree of attitudes effectively.

Fishbein and Ajzen (1975) proposed specific measurement techniques for measuring attitudes and intentions. The use of a Likert-type scale was recommended to provide numerical values for the degree of positive or negative judgment about a statement. The scale needed to have dichotomous endpoints to reflect a degree of choice for the respondent. Scores on the scale ranged from -3 to +3 from left to right with 0 in the center indicating indifference or no opinion. The higher the score, the more positive the attitude and therefore, the greater the likelihood of performing an action can be predicted. Edwards et al. (2000) used numeric values of 1 to 5 with a score of 3 indicating a neutral position. In this study, Edwards et al.'s scale was converted to a scale of 1 to 7 with 4 as the neutral point to better convert to Ajzen's measurement technique.

The two instruments developed by Edwards et al. (2000) were constructed using Ajzen's (1991) Theory of Planned Behavior as a framework. The items in the instruments were grouped to reflect the attitude (direct and indirect), subjective norm, perceived control (direct and indirect), and intention constructs in the theory. According to Edwards et al., the direct attitude construct was measured by general attitudes about pain, pain relief, and the administration of opioid analgesics. The indirect attitude construct was calculated in two groups of items that measured beliefs about the presenting statement in

the question (e.g., *When you administer p.r.n. opioid analgesia, how likely is it that the following consequences will occur for the patient?*), as well as an evaluation of those beliefs (e.g., *How desirable do you feel each of the following consequences would be for a patient who had received p.r.n. opioid analgesia?*).

The subjective norm construct was measured by the effect of external influence on the motivation of the respondents to comply with the referent's expectations (e.g., *How likely is it that your nursing colleagues would think that you should administer p.r.n. opioid analgesia to a patient in pain?*). Items that reflected external factors that may help or impede the ability to administer opioid analgesics measured the construct of perceived control (e.g., *How much control do you believe you have in administering p.r.n. opioid analgesia to a patient?*). Finally, intent was measured in questions that elicited the probability that the respondent would administer opioid analgesia (e.g., *I intend to administer p.r.n. opioid analgesia when caring for a patient with pain*). The Cronbach's alpha scores for each construct reported by Edwards et al. were as follows: (a) direct attitude, 0.78; (b) belief, 0.61; (c) subjective norm, 0.67; (d) direct control, 0.68; indirect control, 0.68, and (e) intention, 0.79.

To date, the most widely used instrument used in nursing research to measure attitudes and beliefs about pain and pain management is The Nurses Knowledge and Attitudes Survey (NKAS). The NKAS was used in many of the nursing studies cited elsewhere in this paper. The NKAS was developed in 1987 by pain research scientists McCaffery and Ferrell and has been frequently used since that time. The NKAS is a 35-item questionnaire consisting of true/false and multiple choice answers plus four brief case studies regarding pain assessment and pain management. The vignettes depict

patients with unrelieved pain despite the administration of opioid medication. Participants choose a pain rating and interventions based on patient variables of age, gender, behavior, and lifestyle. Content validity was established by pain experts, construct validity was established by comparing scores of staff nurses with a variety of nurse experts. Test-retest reliability was reported as $r > .80$, internal consistency reliability was established at alpha $r > .70$ (McCaffery & Ferrell, 1997c).

Jurgens (1996) noted that the NKAS was a general beliefs questionnaire that directly measured knowledge about opioid analgesics but indirectly assessed attitudes toward pain management. He refined this instrument into a Pain Beliefs Questionnaire (PBQ) for nurses, which he described as an inventory of beliefs about pain and its management. The PBQ is a 22-item questionnaire that uses a Likert scale to measure pain beliefs. Items in the PBQ were scored in such a way that the higher the numerical value on the inventory, the lower the use of analgesic medications would be. In three pilot studies conducted by Jurgens the coefficient alpha values of .70 ($n = 24$), .83 ($n = 57$), and .83 ($n = 145$) were reported as adequate internal consistency. Jurgens used a semantic differential scale to detect the favorableness or unfavorableness of opinions about pain, a method that reflects Ajzen's (1991) definition and measurement of attitudes.

A Pain Vignette was also developed by Jurgens (1996) and described a postoperative patient who was experiencing considerable pain. The vignette was pilot tested with clinical experts for clarity and realism prior to his research. The questions that followed the scenario measured intentions to provide analgesia to this simulated patient. Semantic scales were used to measure the degree of likelihood that study participants would provide morphine in the highest dosage as well as the shortest interval permitted

by the prescription, the degree of control the participant perceived when administering analgesia, the importance of the opinions of others in the decision to provide analgesia to a patient with pain, and the importance of other variables that may influence the decision to provide pain relief. This instrument consisted of 32 items divided into 12 sections, each section was related to a construct of the TPB.

McCaffery and Ferrell's (1997c) NKAS, Jurgens' (1996) PBQ, and Edwards' et al. (2001) PS and PMS were some of the primary instruments found in the nursing literature that measured nurses' knowledge and attitudes related to pain and pain management. The alpha scores for these instruments are comparable, but the Jurgens' and Edwards' et al. instruments have no published data to support test-retest reliability. The NKAS was not selected for this study because it uses unipolar scales or true-false responses and thus can only infers attitudes. Jurgens' PBQ was also rejected for this study because it reflects nursing practice that nursing students do not have and it has not appeared in any publication, nor was it found to have been tested in other studies. The PS and the PMS (Edwards et al.) were selected for this study because of their compatibility with Ajzen's (1991) TPB framework and the more general statements that nursing students would understand. However, no other studies were found in the literature that used Edwards' et al. instruments to measure knowledge and attitudes related to pain and pain management.

Procedure

Approval for this study was obtained from the Internal Review Boards at the University of San Diego as well as the target universities. Permission was also obtained from the Deans of the two Schools of Nursing (SON) prior to recruitment of students.

Faculty who taught courses where the target populations were recruited also granted the researcher time to explain the nature and purpose of the research and to collect data. The researcher stressed to the students that participation was strictly voluntary and a decision not to participate would in no way affect standing in the university, the nursing program, or a course grade.

Separate consent forms were distributed to the participants in the control group (see Appendix D) and experimental group (see Appendix E) with the form for the experimental group including consent for a separate 3-hour workshop on pain and pain management. The participants (n = 51) in the experimental group were on an academic semester system; the participants (n = 38) in the control group were on an academic quarter system.

A pretest was administered within the first week of the academic term to all participants. The time for completion of the research instrument was approximately 20 minutes and participants voluntarily stayed beyond class time to complete the survey. The participants in the experimental group were asked to attend a structured educational session during non-class time later in the term. The session was initially scheduled for one month following the pretest. Flyers were placed in each student's campus mailbox as a reminder. On the scheduled date, only one student appeared for the session. The class was cancelled for the day and the investigator elicited assistance from the students' nursing instructor to determine an alternate date and time. Due to scheduling conflicts for both nursing students and the pain expert who would teach the content, the session had to be postponed until one month before the semester ended. Again, reminders were sent via email to participants in the experimental group and a flyer was placed in each

participant's campus mailbox one week before the rescheduled date and time. Despite investigating the most desirable time to maximize attendance, the class was poorly attended with only 12 (23.5% of the experimental group) students present. The reasons given for nonattendance related to participants' class schedules, childcare, examination preparation, course projects, and work requirements.

The basic curriculum used for the educational session was developed by the IASP (2000) and was designed for schools of nursing. A local pain expert (i.e., Doctor of Pharmacology) who teaches pharmacology courses for nurse practitioner students at the graduate level was recruited to present the information. Topics included in the session related to key terms used in pain management such as tolerance, dependence, and addiction; the prevalence of pain and the impact of pain on quality of life; the anatomy and physiology of pain; pain assessment techniques and the use of pain scales; common physical signs and symptoms of drug abuse; misconceptions of opioid therapy; barriers to effective pain management; and the treatment of pain with pharmacologic as well as non-pharmacologic modalities (see Appendix F). A posttest was administered to the participants attending the workshop at the end of the session.

At the end of the academic term, all eligible participants completed a posttest at the end of a class period. Attrition was minimal with only two participants in the experimental group and four participants in the control group who did not complete this posttest.

Names of participants appeared as signatures on the consent forms. A copy of the form, also signed by the investigator, was returned to each study participant. Only a code number appeared on the survey instruments. A master list of participant names and

contact telephone numbers was kept in a locked filing cabinet in the home of the investigator. The investigator secured all surveys as well. Only the investigator had access to any of the survey information.

All surveys were reviewed for completeness and when missing data was minimal, a substitute means of the neutral point on the Likert scale was used. Coded data was then entered into the computer database for subsequent statistical analysis.

Data Analysis

Descriptive statistics were used to analyze the demographic variables and the survey scores and reflected frequencies, means, ranges, and standard deviations. Data was analyzed using Statistical Package for the Social Sciences (SPSS, Inc., 2002) software, version 11.5. For all statistical tests, the alpha level was set at $p < .05$.

Nonparametric techniques were used for data analysis. Nieswiadomy (2002) stated that nonparametric tests make no assumptions about the distribution of the population and can be used when sample sizes are small. However, nonparametric tests are less robust than parametric tests. Where appropriate, a Chi-square technique was used for nominal data. A Mann-Whitney *U* test was appropriate for the ordinal data from the survey instruments to make pairwise comparisons between the experimental and control groups. A Mann-Whitney *U* test is the most powerful of the nonparametric tests to test differences between two independent groups and is comparable to the *t* test (Burns & Grove, 2001; Munro, 2001). The Wilcoxon Signed Ranks test is comparable to paired *t* tests (Munro, 2001) and was used to analyze repeated pretest-posttest measures from the experimental group.

Hypothesis 1 stated that there would be no difference in pretest scores between the control and experimental groups. This hypothesis was tested using Mann-Whitney U tests to compare the means between the two groups. To test the second hypothesis that that there was a difference between pretest and posttest scores of the experimental group, a Wilcoxon test was used for data analysis to compare differences on repeated measures.

Hypothesis 3 stated that there would be a difference in posttest scores measuring attitudes regarding pain between the control group and the experimental group. Data was analyzed using Mann-Whitney *U* tests to compare the differences between the groups.

Hypothesis 4 stated that intentions to administer opioid analgesics for pain would be correlated with attitudes, subjective norm, and perceived behavioral control. To test this hypothesis, items in the PMS that corresponded to these theoretical constructs were collapsed into those categories prior to correlation.

To test the fifth hypothesis, that there was no difference between demographic variables and intention to administer opioid analgesics, data were analyzed using multiple regression. Intention to administer opioid analgesics was the dependent variable and the independent variables were gender, age, marital status, education, ethnicity, and religious preference.

To supplement the fifth hypothesis, intention was regressed onto attitude, subjective norm, and perceived behavioral control to determine if these variables mediated behavioral intentions. Both Jurgens (1996) and Edwards et al. (2001) used this statistical method to test their hypotheses and found positive relationships between the participants' scores and attitudes about administering analgesia as well as scores and behavioral intentions to provide analgesia. Hierarchical regression analysis was used to

determine the proportion of variance accounted for in intention when attitude was controlled for.

Human Participants

As previously stated, approval was obtained from the Institutional Review Boards at the University of San Diego and the two target universities. In addition, the Deans in the Schools of Nursing at the study sites were contacted prior to conducting the study and approval was granted. Instructors of the students in the target populations also agreed to permit data collection at the end of a class period.

Confidentiality. It was made clear that participation in the intervention was strictly voluntary and students were asked to sign an informed consent that delineated the responsibilities of the participants and those of the investigator. Participants were informed they could withdraw from the study at any time without penalty and there would be no separate agreements beyond those included in the consent form. Confidentiality was strictly maintained. All demographic and survey instruments were coded so that no names appeared on the forms. A list with the names and telephone numbers of the participants was maintained by the researcher to be used only for contact purposes in case an issue arose. Study participants were informed of the existence and purpose of this master list. All instruments were secured in a locked drawer and are to be destroyed after five years following completion of the study.

Potential risks and risk management. Since the principal investigator was faculty in one of the Schools of Nursing used in the study, nursing students recruited from this university could have felt obligated to participate or may have feared reprisal if they believed their scores and identities could be obtained. To minimize this risk, the course

instructor introduced the concept of participation in a research study. The investigator then presented the nature and purpose of the research and dismissed those nursing students who chose not participate. The investigator collected the instruments for the pretest and the intervention posttest. The course instructor administered the final posttest in the absence of the investigator. The investigator was the data collector at the university where the participants in the control group were recruited.

The investigator made every attempt to avoid direct contact with the participants who enrolled in the study. The investigator does not teach classes at the program level from which participants in the experimental group were recruited and had no other exposure to them during the study period. In addition, the investigator had no contact with the participants in the control group other than to collect data.

Students may have felt anxiety or stress due to the lack of knowledge regarding the content of the survey items. The topic of pain may also invoke negative feelings related to prior pain related experiences. A sentence at the beginning of each section of the survey instruments clearly stated that there were no right or wrong answers and that only opinions to the statements in the survey were of importance. The investigator reiterated that statement verbally to the participants prior to distributing the surveys.

If overt signs of psychological distress were noted or were self-reported, the investigator was prepared to escort the individual to the campus Counseling Center, located in the same building as the School of Nursing, for immediate assessment and intervention. No such need arose at any of the data collection times.

Potential benefits. Participants who attended the structured educational intervention gained knowledge about current pain assessment and management strategies.

The results of the study could later be used to shape changes in the nursing curriculum that would better prepare nursing students to care for patients with pain.

Expense to participants. The expense to participants was minimal. The primary investment was the time it took to complete the surveys and, for a few, to attend the 3-hour educational intervention on pain management. The date and time for the educational intervention was selected by the investigator, with input from the students, to minimize the expense of travel and/or childcare.

In summary, the methods chosen for data analysis supported the research design, the hypotheses, and the theoretical framework for the study. In addition, the Theory of Planned Behavior (Ajzen, 1991) included instruction on how to effectively measure attitudes and behavioral intentions. Prior research using TBP has demonstrated its utility in predicting behavior.

Chapter 4

Results

The purpose of this chapter is to present the findings from the data analysis for this study. The first section consists of descriptive statistics related to the key demographic variables. The second section contains descriptive and inferential data analyses of the primary data related to Hypotheses 1 through 5. The third section presents supplemental data analysis related to the constructs of the TPB in Hypothesis 5 and a linear regression of predictor variables on nursing students' intention to administer opioid analgesics to patients experiencing pain. Data analysis in this study was patterned after Edwards et al.'s (2001) study of nurses' intentions to administer opioid analgesia. References are made to their study during the course of discussion in this chapter.

Description of the Sample

Eighty-nine entry-level nursing students participated in the study and completed a pretest of attitudes about pain and the administration of opioid analgesia. Fifty-one students from one university comprised the experimental group and thirty-eight students from a second university comprised the control group. Following a routinely scheduled class period, the investigator personally recruited students. Twelve students (23.5%) from the experimental group attended a structured educational intervention designed to provide current information about pain and pain management followed by the first

posttest. Attrition for the final posttest was low in each group; only two (4%) from the experimental group and four (10.5%) from the control group failed to complete the final posttest. The aggregate completion rate for the study was 93%.

The majority of the total participants in the study were female (93.3%). In the experimental group there were 46 (90.2%) females and 5 (9.8%) males; the control group consisted of 37 (97.4%) females and 1 (2.6%) male.

Ages of the participants in the total sample ranged from 18-54 years with a mean age of 24.5 years. The youngest participant was in the experimental group and the oldest participant was in the control group. The mean age in the experimental group was 25.4 years; the mean age in the control group was 23.3 years. Nineteen (37.3%) of the participants in the experimental group were 24 years or older while only seven (18.4%) in the control group were older than 24 years.

The majority of participants (82.1%) in the total sample were not married (single or divorced), whereas 17.9% of the participants were married. In the experimental group, 35 participants (68.6%) were single while 12 (23.5%) were married and four (7.8%) were divorced. In the control group, 34 participants (89.5%) were single and four (10.5%) were married.

The demographic variable of education was categorized by the highest earned degree. The total percentage of participants with high school diplomas ($N = 42$) was 47.2%; the percentage of participants with an earned associate's degree ($N = 42$) was also 47.2%. Only a small number of participants held a bachelor's degree ($N = 4$; 4.5%) or a master's degree ($N = 1$; 1.1%). Eighteen (35.3%) participants in the experimental group had the minimum high school diploma. Participants with associate's degrees

numbered 32 (62.7%), only one (2.0%) had a bachelor's degree. In the control group, the number of participants who indicated high school as the minimum level education was higher (n_c = 24, 63.2%) while the number of participants with associate's degrees was lower (n_c = 10, 26.3%) than in the experimental group. Three participants (7.9%) had earned a bachelor's degree and one (2.6%) participant, the oldest student in the cohort, had a master's degree.

Overall, the participants were somewhat ethnically diverse; however, the largest majority (89.0%) was Caucasians. Other ethnic groups, although small numbers, were also represented in the total sample – Asian (N = 3, 3.4%), Pacific Islander (N = 3, 3.4%), Hispanic (N = 2, 2.2%), and Native American (N = 2, 2.2%). There were no African Americans in either cohort. Forty-four participants (86.3%) in the experimental group were Caucasian, two (3.9%) were Asian, three (5.9%) were Pacific Islanders, and one (2.0%) was Native American. There were no participants of Hispanic origin in this group. The remainder of the group consisted of two (5.3 %) Hispanics, one (2.6%) Asian, and one (2.6%) Native American student.

Religious preferences were less diverse. Despite choices of several religions for this demographic variable, only two were prevalent. Nearly two-thirds (N = 57, 64.1%) of the total sample selected the category of Protestant while 10 (11.2%) chose Roman Catholic. Fourteen (15.7%) participants selected *other* as their religious preference but gave no specifics. Eight (9.0%) participants indicated they had no religious affiliation. The experimental group was more diverse than the control group with 23 (45.1%) participants identifying themselves as Protestant and 10 (19.6%) of participants identifying themselves as Roman Catholic. Slightly more than one-third (35.3%) of the

participants in this group indicated no specific religious preference. Eleven (21.6%) participants chose the category, *other*, despite a listing of seven major religions; seven (13.7%) reported they had no religious affiliation. In contrast, the control group was overwhelmingly Protestant. Thirty-four students (89.5%) identified themselves as Protestant, three (7.9%) selected *other*, and one (2.6%) had no religious preference. These results were expected, as both universities were private with strong Protestant heritages; however, admittance to either university was not restrictive about religious preferences.

A final demographic variable was the participants' primary job. All participants were asked to write in a response for any work they did outside of their student status. The majority of participants (70.8%) classified themselves as full-time students. A wide range of other work responses was reported. In the experimental group, slightly more than half (52.9%) were full-time students. The remainder, 47.1%, held part-time jobs in a variety of settings (e.g., food service, business, clerical, retail, childcare, homemaker responsibilities). Five participants (9.8%) worked in health care as caregivers in the home as opposed to a clinic or hospital setting. A larger percentage of participants in the control group ($n_c = 36$, 94.7%) were full-time students. One participant (2.6%) worked in the food service industry and one (2.6%) was a licensed practical nurse (LPN) with part-time employment. The control group was much less likely to have a job outside of school. Table 1 shows the demographic variable frequencies by experimental and control groupings.

Cross tabulation was conducted to test for homogeneity of the two groups. Each variable was collapsed into a contingency table for comparison. Two cells represented

the experimental and control groups. The variable was then divided into two groupings that will be explained in the discussion below. Pearson Chi-Square tests results are reported when cells had more than five items. When cells contained less than five items, Fisher's Exact test results are reported.

There were no significant differences for the variable of gender with one cell representing females and the other males (Fisher's Exact p =.233). The variable of age was divided along the mean age. One cell represented those under the age of 25 years, another cell represented those 25 years and older. No statistically significant differences were found for age (Pearson Chi-Square = 3.50, p = .06). Marital status was collapsed into groupings of married and not married. The differences in group means were not statistically significant (Fishers' Exact p = .164). Ethnic origins were grouped into Caucasian and non-Caucasian; again no statistically significant differences were found (Fisher's Exact p = .752). Significant differences were noted, however, for educational level (Pearson Chi-Square = 6.79, p = .01) when the category was divided into high school and collegiate categories, work status (Pearson Chi-Square = 18.40, $p < .001$) when divided into employed and not employed, and religious preference (Fishers' Exact p = .01) when divided into Christian and non-Christian groupings. Thus, the experimental group and the control group were not homogeneous in all areas.

Table 1

Frequency Distribution of Demographic Variables

	Group A[a]		Group B[b]		Total[c]	
	f	(%)	*f*	(%)	*f*	(%)
Gender						
Male	5	(9.8)	1	(2.6)	6	(6.7)
Female	46	(90.2)	37	(97.4)	83	(93.3)
Age						
18-19 years	9	(17.6)	1	(2.6)	10	(11.1)
20-29 years	30	(58.8)	34	(89.5)	64	(71.9)
30-39 years	8	(15.7)	0	(0.0)	8	(9.0)
40 years and over	4	(7.8)	3	(7.9)	7	(7.9)
Marital Status						
Single	35	(68.6)	34	(52.9)	69	(77.5)
Married	12	(23.5)	4	(10.5)	16	(17.9)
Divorced	4	(7.8)	0	(0.0)	4	(4.5)
Work Status						
Full-time Student	27	(52.9)	36	(94.7)	63	(70.8)
Part-time Employment	24	(47.1)	2	(5.3)	26	(29.2)

(table continues)

	Group A[a]		Group B[b]		Total[c]	
	f	(%)	*f*	(%)	*f*	(%)
Highest Education						
High School Diploma	18	(35.3)	24	(63.2)	42	(47.2)
Associate's Degree	32	(62.7)	10	(26.3)	42	(47.2)
Bachelor's Degree	1	(2.0)	3	(7.9)	4	(4.5)
Master's Degree	0	(0.0)	1	(2.6)	1	(1.1)
Ethnicity						
Caucasian	44	(86.3)	34	(89.5)	78	(87.6)
Asian	2	(3.9)	1	(2.6)	3	(3.4)
Pacific Islander	3	(5.9)	0	(0.0)	3	(3.4)
Native American	1	(2.0)	1	(2.6)	2	(2.2)
Hispanic	0	(0.0)	2	(5.3)	2	(2.2)
Other	1	(2.0)	0	(0.0)	1	(1.1)
Religious Preference						
Protestant	23	(45.1)	34	(89.5)	57	(64.1)
Roman Catholic	10	(19.6)	0	(0.0)	10	(11.2)
Other	11	(21.6)	3	(7.9)	14	(15.7)
None	7	(13.7)	1	(2.6)	8	(9.0)

Note. [a] Experimental group ($n_e = 51$); [b] Control group ($n_c = 38$); [c] Total participants ($N = 89$).

Survey Instruments

The two survey instruments used in this study were developed by Edwards et al. (2001) and were entitled the Pain Survey (PS) and the Pain Management Survey (PMS). These self-reporting instruments reflected the constructs and scoring methodology suggested by Ajzen and Fishbein (1980) in their Theory of Reasoned Action, the precursor to Ajzen's (1991) Theory of Planned Behavior, the theoretical model for this study. The instruments used a Likert scale from 1 (strong negative responses) to 7 (strong positive responses) to measure the degree of disagreement or agreement with the statements in the survey items. The number 4 represented no opinion.

Each of the instruments was divided into sections with content that measured one concept. The PS had three sections, the first of which was demographic information. The next section was entitled *Opinions about Pain*. In this section, there were 18 items that elicited general opinions about pain (e.g., *Pain is the result of damage to the tissues of the body*). The third section was entitled *Opinions about Pain Relief*. The investigator in this study divided this section into two parts, the first consisted of general questions about pain relief (e.g., *People can easily get addicted to pain relieving medication*) and consisted of 17 items. The second part consisted of 27 items that related to opinions about the personal pain experience (e.g., *I would ask for pain relieving medication when I needed it*).

In addition, there were two items that asked the respondents to indicate how much they knew about pain relieving medication and what information they would want to know about them. Two rating scales were also included that asked respondents to circle a number from 0 (*no pain*) to 10 (*pain as bad as you can imagine*) that best

described a previous pain episode at its worst and the number that best described their pain on the average. Two final questions asked respondents to rate how much relief pain medications gave them on a scale of 0 (*do not ever take pain relieving medications*) to 5 (*complete relief*). The other asked how much they believed pain-relieving medications should give. These six items were not included in the aggregate or comparison of overall scores for the statistical analysis but were analyzed separately.

The PMS also consisted of three sections. The first was entitled *Pain* but the items were designed to elicit opinions about patients' pain. This section had 15 items (e.g., *Patients' pain can be reliably assessed by their behavior*). Following that was a section with 13 items, entitled *Narcotic Analgesia.* Items in this section asked for respondents' opinions about narcotic analgesia and its use (e.g., *In general, patients should be encouraged to have non-narcotic rather than narcotic analgesia for pain*).

The final section of the PMS, entitled *Administration of Narcotic Analgesia*, consisted of 35 items. In this section, Edwards et al. (2001) identified and measured the TPB constructs. The first construct (i.e., intention) was measured by three items (e.g., *How likely would you be to give a narcotic analgesic prescribed on a PRN [as needed] basis to a patient who has pain?*).

Twelve items in two groups measured indirect attitudes about pain. Each of the items had three positive and three negative responses. One grouping asked about the likelihood of positive analgesic outcomes (e.g., *When you administer PRN narcotic analgesia, how likely is it that the patient will have increased comfort?*) and negative consequences (e.g., *When you administer PRN narcotic analgesia, how likely is it that the patient will have inadequate pain relief?*). The second grouping asked about the

desirability of the consequences of narcotic analgesia. Again, this group consisted of positive (e.g., *How desirable do you feel increased comfort would be for a patient who has received PRN narcotic analgesia*?) and negative statements (e.g., *How desirable do you feel inadequate pain relief would be for a patient who has received PRN narcotic analgesia?*). Items in the likelihood group were paired with items in the desirability group to allow for evaluation of similar statements.

The construct of subjective norm, the important others who would approve or disapprove of administering narcotic analgesia, identified the referents as patients, patients' families, nursing colleagues, and medical staff. As with the beliefs construct, four items were paired in two questions asking about referents' influence on opioid analgesia administration (e.g., *In general, how likely is it that the patient would think you should administer PRN narcotic analgesia?*) and the effect of that influence (e.g., *In general, how likely are you to go along with the wishes of the patient?*).

The final construct, volitional control, was separated by Edwards et al. (2001) into direct control and indirect control. Direct control was measured in three items (e.g., *Administering PRN narcotic analgesia to a patient with pain is within my control*). Indirect control was measured in two questions with paired items as noted above. One question asked about the effect of certain factors on opioid analgesic administration (e.g., *How much effect does the patient's medical/surgical condition have on whether you administer PRN narcotic analgesia to a patient with pain?*). The other question elicited the degree of consideration given to those effects (e.g., *How often would you consider the patient's medical/surgical condition prior to administering PRN narcotic analgesia to a patient with pain?*).

To determine the overall pretest attitude scales of the respondents, items in each section of the instruments were summed for additive indices. The mean scores for the Pain Relief Index, Personal Pain Index, Patients' Pain Index, and the Narcotic Analgesia Index were higher in the experimental group indicating more agreement with the survey items. The mean scores in the control group were higher for the Pain Opinion Index and the Narcotic Analgesia Administration Index indicating stronger opinions about pain and willingness to give opioid analgesia to patients with pain. There were statistically significant differences in means in the sections Narcotic Analgesia (M_e = 52.68; M_c = 34.70; z = 3.26, p = .001) and Narcotic Analgesia Administration (M_e = 37.81; M_c = 54.64; z = 03.04, p = .002). Results of the analysis of the additive indices are identified in Table 2. Results for the remainder of the data analysis will be presented later in this chapter.

Table 2

Pretest Differences between Means for Agreement with the Items in the Additive Pain Indices

Name of Index	Number of Items	Possible Range	Group A[a] *M*	Group B[b] *M*	*z*	*p*
Pain Opinions	18	18-126	44.72	45.38	-.12	.90
Pain Relief	17	17-119	40.09	39.51	-1.73	.08
Personal Pain	15	17-119	45.74	42.54	-.31	.76
Patients' Pain	15	15-105	46.83	42.54	-.78	.44
Narcotic Analgesia	13	13-91	52.68	34.70	-3.26	.00***
Narcotic Analgesia Administration	35	35-245	37.81	54.64	-3.04	.00***

Note. [a]Experimental Group ($n_e = 51$); [b]Control Group ($n_c = 38$).

*** $p < .001$.

Data Analysis Related to Research Hypotheses

Hypothesis 1. There will be no difference in pretest scores measuring attitudes regarding pain and pain management between the control group and the experimental group. Hypothesis 1 was rejected.

Due to the number of items in the two surveys, only statistically significant differences are shown the tables that accompany the text.

The *Pain Opinions* section of the PS elicited general opinions about pain and its physical and psychological components (e.g., *Feeling depressed makes pain worse.*) as well as how much control one had for relieving pain (e.g., *It is impossible to do much to relieve pain.*). The aggregate mean scores ($N = 89$) for the 18 items ranged from 1.69 to 6.16 on a scale of 1 – 7. There were no statistically significant differences in means between the experimental and control groups for any of the items in this section; however, statistically significant differences were found in means for several of the items in the second section of the PS and the three sections of the PMS.

Participants (77.5%) in this study believed pain was the result of tissue damage, the medical definition (AHCPR, 1992a). Seventy-three percent of the participants thought it was possible to influence the amount of pain that was experienced and believed that relaxation (76.4%) was helpful. In addition, participants felt mental attitudes played a role in the management of pain. Responses that depression (89.9%) and anxiety (86.4%) made pain worse were noted. Respondents (87.7%) also believed that it was important to be pain free.

Table 3 illustrates statistically significant differences between the experimental and control group mean scores for *Opinions about Pain Relief.* The aggregate mean scores ($N = 89$) for the 18 items in this section ranged from 1.83 to 5.04 on a scale of 1 – 7. Scores for both experimental and control groups were below 4 (no opinion) on more than two thirds of the items in this section, indicating general disagreement with the statements about side effects of pain relieving medications and addiction to opioid analgesics. In general, the participants in the experimental group had greater concerns about addiction (84.3%) and side effects of vomiting (74.5%) and drowsiness (41.1%) than participants in the control group. Participants in the control group had higher mean scores for concerns about the side effects of constipation (65.8%) and vomiting (94.7%). They were not inclined to believe that if analgesics were taken when pain levels were low, they might not work as well if the pain increased (68.5%). They also disagreed that opioid analgesia should be saved for the worst pain (86.9%).

In the *Opinions about Personal Pain* portion of this section, the items reflected opinions about personal pain experiences, pain reporting, the use of pain relieving medications, and how pain affected the respondent. The range of aggregate mean scores ($N = 89$) for the 18 items was 2.71 to 6.07 on a scale of 1 – 7. Participants (57.7%) believed they could withstand a great deal of pain, agreed that they would ask for pain relieving medication when it was needed (83.1%), and would report to the doctor (91.0%) or nurse (92.2%) if the pain medication did not provide relief. Participants (88.7%) in both the experimental and control groups strongly agreed that they would like to be involved with decisions about the use of pain relieving medications. They disagreed with statements that they would let the doctor (48.3%) or nurse (50.5%) make

pain management decisions for them or would wait until asked (71.9%) if pain medication was needed. Coping skills appeared to be high as both groups indicated they had few psychological effects from pain. There was only one statistically significant finding. Participants in the experimental group scored higher on an item that indicated pain made them feel angry ($M = 3.04$, $SD = 2.27$, $p = .03$).

Table 3

Pretest Differences Between Experimental and Control Group Means for Responses to Opinions about Pain Relief (Scale = 1 – 7)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
There is a real danger of becoming addicted to narcotics	5.25	1.50	4.24	1.68	625.50	.01**
People can easily get addicted to pain relieving medications	4.90	1.57	3.53	1.83	549.00	.00***
It is a good idea not to have pain medication until needed	4.31	1.92	3.16	1.73	638.00	.01*
Pain medication is very addicting	3.98	1.64	3.05	1.68	644.50	.01*
How concerned are you about addiction	3.10	1.51	2.63	1.73	688.50	.02*

Note. [a] Experimental group ($n_e = 51$); [b] Control group ($n_c = 38$).

*$p < .05$. **$p < .01$, ***$p < .001$.

Also in this section, participants were asked to describe their typical pain by selecting one word from a choice of five descriptors. In the experimental group, the majority of participants (n_e = 32; 62.7%) chose the word *discomforting*, others (n_e = 10; 19.6%) chose the word *distressing*, while a few selected *mild* (n_e = 7; 13.7%), or *horrible* or *excruciating* (n_e = 2; 2.0% each). Results for the participants in the control group were similar. Nearly two thirds of the participants (n_c = 24; 63.2%) indicated their typical pain was *discomforting*. *Mild* pain was selected by six participants (15.8%), *distressing* pain was also selected by six participants (15.8%). The remainder (n_c = 2, 5.3%) indicated their typical pain was *horrible*. Students were also asked to rate their worst pain. In the experimental group the mean score was 6.71 on a visual analog scale of 0 – 10; for the control group the mean score was 6.84. When asked to circle a number that best described their average pain, the mean scores were considerably lower (M_e = 3.10; M_c = 2.63). When asked to choose from five responses regarding how much relief they received from pain medications, the responses were lower than expected. Forty-six percent of the participants stated they received *some relief*, 38.2% received *a lot of relief*, but only 9% had complete relief. Study participants were asked how much relief they thought pain relieving medications should give (scale 0 = no relief, 1 = a little relief, 2 = moderate relief, 3 = a lot of relief, 4 = complete relief). The opinion of half of participants in both groups was that pain medications should give a lot of relief (n_e = 27, 52.9%; n_c = 19, 50.5%). The *complete relief* choice was selected less often but was a higher choice for participants in the control group (n_c = 17, 44.7%) than in the experimental group (n_e = 11, 21.6%). Only a few students (n_e = 13, 25.5%; n_c = 2, 5.3%) indicated that *moderate relief* was sufficient.

Two final questions in this section related to participants' knowledge of analgesics. The first question asked how much they knew about pain relieving medications. The student was to circle a number on a scale of 0 (*nothing at all*) to 10 (*a great deal*). The mean score for the experimental group was 4.34 and the control group's mean score was 3.45, indicating neither group perceived adequate knowledge about pain pharmacotherapy.

The second question asked what they would like to know about pain relieving medications. The students were asked to provide a written response that was coded as follows: 0 = *no answer*, 1 = *use of these medications*, 2 = *complications/side effects*, 3 = *addiction*, 4 = *types of medications available*, 5 = *composition of pain relieving medications*, and 6 = *everything*. Approximately three quarters of eligible participants in the experimental group (76.5%) and two thirds of the participants in the control group (65.8%) provided a written answer to this question. The most frequent responses related to complications/side effects (n_e = 11, 21.6%; n_c = 9, 23.7%), general use of pain relieving medications (n_e = 10, 19.6%; n_c = 7, 18.4%), and addiction (n_e = 9, 17.6%; n_c = 5, 13.2%). These findings were not surprising as none of the students had yet taken a pharmacology course.

There were several statistically significant differences in means between the experimental and control groups for *Opinions about Patients' Pain*, the first section of the PMS. These are shown in Table 4. The range of aggregate mean scores (N = 89) was 2.00 to 6.04 on a scale of 1 – 7. Participants in both groups agreed that pain was whatever the patient said it was (78.7%) and that those reports would be truthful (94.2%). They also agreed that patients had a right to expect total pain relief (75.3%)

and that patients could be maintained in a pain-free state (64.1%). Students in the experimental group believed that pain could be reliably assessed by patients' behavior ($M_c = 5.18$, $SD = 1.29$; $M_c = 4.03$, $SD = 1.60$), a difference that was statistically significant. Both groups of students (87.7%) disagreed with the statement that an RN's estimation of pain was more valid than the patient's report.

Only 5 of the 15 items in this section were in the category of *slightly agree* with a mean between 5 and 6 on a scale of 1 – 7, indicating general disagreement with the majority of items relating to pain in this section. Physiological signs were neither seen as reliable pain indicators nor was the patient's medical condition. Participants disagreed with statements that patients should expect to have pain or that patients would be reluctant to report pain. They also did not believe that pain was related to patient characteristics such as age, gender, or ethnicity. Participants in the experimental group disagreed more than the participants in the control group did that patients could sleep in spite of pain. The difference was statistically significant.

Table 4

Pretest Differences Between Experimental and Control Group Means for Responses to Opinions about Patients' Pain (Scale = 1-7)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
What a patient says about pain is true	5.66	1.12	6.61	0.60	438.00	.00***
Patients' pain can be reliably assessed by their behavior	5.18	1.29	4.03	1.76	627.50	.00***
Patients have a right to expect total pain relief	5.16	1.79	5.87	1.60	714.00	.03*
Pain is whatever the patient says it is	5.06	1.75	6.79	0.47	362.50	.00***
Patients can be maintained in a pain-free state	4.69	1.48	5.34	1.44	723.00	.04*
Age is a factor that influences the amount of pain experienced	4.54	1.53	3.24	1.60	522.00	.00***
Patients' pain can be reliably assessed by physiological signs	4.38	1.41	3.71	1.41	733.50	.05*

(table continues)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
Patients pain can be determined from their medical condition	3.78	1.52	2.84	1.50	647.00	.01**
Patients can sleep in spite of pain	3.76	1.65	4.42	1.48	738.00	.05*
Estimation of pain by an RN is more valid than patients' reports	2.35	1.38	1.53	0.80	614.50	.00***

Note. [a] Experimental group ($n_e = 51$); [b] Control group ($n_c = 38$).

*$p < .05$. **$p < .01$. ***$p < .001$.

The next PMS section, *Opinions about Narcotic Analgesia*, contained questions about the general use of analgesics (e.g., dosing, schedules, type of analgesic to administer, and the length of time narcotics should be used), likelihood of addiction, and who should or should not receive them (e.g., children, the elderly, persons with a history of opioid addiction). The range of aggregate mean scores ($N = 89$) for the 13 items was 3.00 to 5.15 on a scale of 1 – 7. One question addressed the issue of breakthrough pain; pain that is reported between scheduled dosing periods.

Participants agreed with statements that it would be best to administer the least amount of opioid analgesia (64.0%) and that it would be best to start off with non-narcotic analgesia (47.2%, 33.3% uncertain). They also agreed that patients would be reluctant to ask for opioid analgesics (58.3%) and that nurses could not rely on them to do so (57.7%).

Participants generally disagreed with statements that addiction would likely occur (42.7%, 34.8% uncertain) from the use of opioid analgesics. They were less likely

to agree that elderly patients should not receive opioids (53.9%) or would require a lower dose (39.3%, 42.7% uncertain). They also disagreed that opioid analgesics should be withheld from children (30.4%, 46.1% uncertain) or patients with a history of narcotic addiction (36.0%, 29.2% uncertain). Responses (55.1%) to whether patients should wait until the opioid dose was due if breakthrough pain occurred was also negative. Participants disagreed that opioid analgesia should not be required for longer than three days postoperatively (39.4%, 39.3% uncertain). Participants in the experimental group had higher mean scores overall for 14 of the 15 items in this section, only five were statistically significant (see Table 5).

Table 5

Pretest Differences in Experimental and Control Group Means for Responses to Opinions about Narcotic Analgesia (Scale = 1 – 7)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
It is best to administer the least possible amount of narcotics	5.41	1.12	4.79	1.56	734.00	.00***
Children should not be given narcotic analgesia for pain	4.22	1.45	3.34	1.15	622.00	.00***
Narcotic analgesia should not be required for longer than 3 days postoperatively	3.92	1.40	3.13	1.30	601.50	.00***
Addiction is likely to occur as a result of treating pain with narcotic analgesia	3.88	1.19	3.00	1.45	594.00	.00***
Elderly patients should not receive narcotic analgesia	3.22	1.45	2.71	1.21	729.00	.04*

Note. [a] Experimental group ($n_e = 51$); [b] Control group ($n_c = 38$).

*$p < .05$. **$p < .01$. ***$p < .001$.

The final section of the PMS, *Opinions about the Administration of Narcotics*, was the largest with 35 responses. It was here that the TPB constructs were measured. The items in this section related to general attitudes about the positive and negative consequences of opioid analgesia, subjective norm influence on the administration of opioid analgesics, beliefs about volitional control, and intention to administer opioid analgesics. The range of aggregate mean scores ($N = 89$) was 2.21 to 6.15 on a scale of 1 – 7.

Participants in the control group had higher mean scores for 28 of the 35 items; 16 were statistically significant. Seven of the items were rated higher by participants in the experimental group; only one item was statistically significant. The significant differences are shown in Table 6. The participants in the control group agreed or strongly agreed with 24 of the items in this section that related to the likelihood and desirability of positive outcomes of opioid analgesic use, how likely they would consider the wishes of the referents, how often they considered the expectations of the referents, how much control they believed they had to administer opioid analgesics, and whether they intended to do so. Participants in the experimental group also agreed with many of these items but to a lesser degree. Mean scores were close to neutral on the scale. However, the students in this group (31.4%, 47.1% uncertain) were more likely to think that addiction was a problem than students (58.0% disagreed) in the control group. Participants in both groups disagreed or strongly disagreed that side effects (72.1%), inadequate pain relief (67.9%), or addiction (72.1%) were desirable consequences of opioid administration.

When making decisions about opioid administration, study participants were highly influenced by wishes of the patient (89.9%), medical staff (83.2%) and their nursing colleagues (75.2%) but to a lesser degree, patients' families (52.8%). Participants agreed that some effect was made on their decisions by the type of pain the patient was experiencing (59.5%), the patient's condition (57.3%), patient characteristics (46.1%), nursing unit expectations (42.7%), and the route of administration (42.7%).

Despite external pressures, the study participants intended to administer opioid analgesia to patients with pain. There were, however, differences in the opinions between the experimental and control groups. The mean scores were higher in the control group than the experimental group for intention (76.3%; 45.0%, 52.9% uncertain), control (73.6%; 33.3%, 58.8% uncertain), and ease of administration (92.1%; 54.9%). Eighty-four percent of those in the control group perceived a great deal of control over administering opioid analgesics while less than half (41.2%, 47.1% uncertain) of those in the experimental group felt they had much control. This finding could be explained by the fact that the curriculum was different in the nursing programs at each university. Students in the control group were slightly ahead of their counterparts in that they had a brief clinical experience in a skilled nursing facility and may have had exposure to nurses administering medications to residents. Observation of those nurses may have influenced their perceptions of control over this task.

Table 6

Pretest Differences in Experimental and Control Group Means for Responses to Opinions about the Administration of Narcotic Analgesia (Scale = 1-7)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
How desirable is increased comfort?	5.90	1.20	6.47	0.73	747.00	.05*
How likely are you to go along with wishes of the patient?	5.47	0.99	6.21	0.74	562.50	.00***
How likely is it that the patient will have increased comfort?	5.43	1.06	6.03	0.72	656.50	.01**
How likely are you to go along with wishes of the medical staff?	5.22	1.27	6.13	1.02	556.00	.00***
How often do you consider nursing unit expectations?	5.10	1.39	5.68	1.14	710.00	.03*
How likely is it that the patient thinks you should administer narcotic analgesia?	5.00	1.25	5.53	1.11	740.00	.05*
How easy would it be for you to administer narcotic analgesia?	4.94	1.30	5.92	1.10	533.00	.00***
How often do you consider the route of administration?	4.82	1.21	5.39	1.24	687.00	.02*

(table continues)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
How likely are you to go along with wishes of nursing colleagues?	4.78	1.12	5.58	1.03	578.00	.00***
I intend to administer narcotic analgesia to a patient with pain.	4.78	1.10	5.66	1.34	603.50	.00***
How likely are you give narcotic analgesia?	4.75	1.15	5.61	1.03	552.00	.00***
How likely are you to administer narcotic analgesia?	4.55	1.19	5.45	1.11	715.50	.03*
How much control do you believe you have in administering narcotic analgesia?	4.47	1.24	5.39	1.05	520.00	.00***
Administering narcotic analgesia is within my control.	4.41	1.04	5.39	1.53	539.00	.00***
How likely is it that your nursing colleagues think you should administer narcotic analgesia?	4.27	1.00	5.32	1.09	464.00	.00***

(table continues)

Survey Item	Group A[a]		Group B[b]		Mann-Whitney *U*	
	M	*SD*	*M*	*SD*	*U*	*p*
How likely is it that medical staff thinks you should administer narcotic analgesics?	4.24	0.97	5.55	1.15	386.00	.00***
How likely is it that the patient will have addiction?	4.06	1.05	3.03	1.42	576.50	.00***

Note. [a] Experimental group (n_e = 51); [b] Control group (n_c = 38).

*$p < .05$. **$p < .01$.***$p < .001$.

Hypothesis 2. There will be a difference between pretest and posttest scores measuring attitudes regarding pain and pain management in the experimental group after receiving a structured educational intervention. Hypothesis 2 was supported.

The structured educational intervention was attended by 12 (23.5%) students from the pretest experimental group. Prior to data analysis, the surveys from those 12 participants were matched for the Pretest (P), Posttest 1 (P1), and Posttest 2 (P2). Wilcoxon tests were then conducted on the matched pairs to test Hypothesis 2. Data were reported for comparison of Pretest means with Posttest 1 means and Pretest with Posttest 2 means.

There were several statistically significant differences in mean scores for both the PS and the PMS. In general, mean scores were lower for items in the survey that were incorrect statements (e.g., *Pain is the result of tissue damage*, *Pain can be reliably assessed by behavior*) and increased when opinions improved (e.g., *Being free from pain is important*, *Patients have a right to expect total pain relief*).

In the *Opinions about Pain* section of the PS, participants were more in agreement that being pain free was important. After the intervention, they were less likely to agree that pain was a sign of tissue damage, a sign of illness, or that something was wrong with the body. While they disagreed that there was little one could do to control or ease pain, they did agree that relaxation would improve the ability to cope with pain. Opinions increased about the negative impact that depression and anxiety had on the perception of pain, and that thinking about pain made it worse. Mean scores increased in response to how activity made pain worse and participants opinioned that pain would prevent one from enjoying any hobbies or social activities. Three items

reached statistical significance. At Posttest 2, participants indicated slight disagreement with a statement that indicated pain was the result of tissue damage as opposed to agreement with this concept at the time of the pretest ($M_P = 5.83$, $SD = 1.27$; $M_{P2} = 3.92$, $SD = 2.31$, $p = .04$). Participants also agreed that anxiety made pain worse after the educational intervention ($M_P = 5.08$, $SD = 1.38$; $M_{P1} = 6.08$, $SD = 1.08$, $p = .03$; $M_{P2} = 6.08$, $SD = 0.67$, $p = .04$) and that pain prevented one's being involved in social activities ($M_P = 4.33$, SD 2.10; $M_{P1} = 5.92$, $SD = 1.24$, $p = .02$, $M_{P2} = 6.33$, $SD = 0.65$, $p = .01$).

Changes in concerns about addiction in the *Opinions about Pain Relief* section of the PS were statistically significant (see Table 7). Opinions changed from agreement to disagreement with those statements indicating that there was a danger of becoming addicted to pain relieving medications ($M_P = 4.83$, $SD = 1.85$; $M_{P1} = 2.92$, $SD = 1.78$, $p = .04$; $M_{P2} = 3.17$, $SD = 1.64$, $p = .05$), people would easily become addicted ($M_P = 4.75$, $SD = 12.50$; $M_{P1} = 2.67$, $SD = 1.50$, $p = .03$; $M_{P2} = 3.25$, $SD = 2.09$, $p = .04$). Concern about addiction also declined ($M_P = 5.17$, $SD = 2.73$; $M_{P1} = 2.92$, $SD = 2.35$, $p = .05$; $M_{P2} = 3.17$, $SD = 1.64$, $p = .40$) indicating that the educational intervention had a positive effect on the participants who attended. Conversely, concerns about the side effects of constipation, vomiting, nausea, itching, and drowsiness increased. Participants disagreed that doctors and nurses might find it annoying to be told about pain. Interestingly, the mean score rose for those items after the intervention but returned to disagreement at Posttest 2. There was general disagreement that pain-relieving medication should be saved in case pain worsened and that medication should not be used until it was really needed.

Table 7

Differences in Mean Scores for the Experimental Group Pretest and Two Posttest Responses[a] to Opinions about Pain and Opinions about Pain Relief (Scale = 1 – 7)

Survey Item	Pretest		Posttest 1[a]			Posttest 2[b]		
	M	*SD*	*M*	*SD*	*p*	*M*	*SD*	*p*
Opinions about Pain								
Pain is the result of tissue damage	5.83	1.27	4.67	2.06	.11	3.92	2.31	.04*
Being anxious makes pain worse	5.08	1.38	6.08	1.08	.03*	6.08	0.67	.04*
Pain prevents you from enjoying social activities	4.33	2.10	5.92	1.24	.02*	6.33	0.65	.01*
Opinions about Pain Relief								
How concerned would you be about addiction?	5.17	2.73	2.92	2.35	.05*	3.75	2.83	.40
There is a real danger of becoming addicted	4.83	1.85	2.92	1.78	.04*	3.17	1.64	.05*
People can easily become addicted to pain medicine	4.75	1.96	2.67	1.50	.03*	3.25	2.09	.04*
Doctors might find it annoying to be told about pain	2.75	2.01	5.00	1.60	.01**	3.67	1.72	.21

Note. Both Posttests were compared to the Pretest administered at the beginning of an academic term. [a]Posttest 1 was administered immediately after an educational intervention. [b]Posttest 2 was administered at the end of an academic term. All groups, $n = 12$.

*$p < .05$. **$p < .01$.

Participants strongly disagreed that being stoic about pain was important and that people who complained about pain were weak. Opinions about whether an injection was painful stayed constant over the three times the research instrument was administered.

There were seven items in the *Opinions about Personal Pain* section with differences in means that were statistically significant (see Table 8). Analysis showed the mean scores decreased from *strongly agree* to *agree* when participants were asked their opinions about whether they would tell the doctor if pain medication was not working ($M_P = 6.75$, $SD = 0.62$; $M_{P1} = 5.27$, $SD = 1.67$, $p = .03$; $M_{P2} = 5.75$, $SD = 0.87$, $p = .02$).; however, they strongly agreed on each of the surveys that they would tell the nurse if pain medication was not working. Interestingly, participants were somewhat neutral about telling someone if they were in pain yet they disagreed that they would wait until asked by the nurse if they needed pain relieving medication ($M_P = 1.83$, $SD = 0.72$; $M_{P1} = 2.67$, $SD = 1.30$, $p = .02$; $M_{P2} = 3.17$, SD, 1.83, $p = .03$). They also disagreed that they would leave it to the nurse to decide about the medication ($M_P = 2.42$, $SD = 1.38$; $M_{P1} = 3.75$, $SD = 1.55$, $p = .03$; $M_{P2} = 3.25$, $SD = 1.49$, $p = .20$). Findings also indicated that participants agreed they did not frequently use pain medications ($M_P = 3.67$, $M_{P1} = 5.58$, $SD = 1.44$, $p = .03$; $M_{P2} = 5.58$, $SD = 1.38$, $p = .02$).

The physical effects of pain on the respondents also showed statistical significance. Participants were in strong disagreement at Posttest 1 but not at Posttest 2 that pain affected their ability to move ($M_P = 4.00$, $SD = 2.22$; $M_{P1} = 2.08$, $SD = 2.47$, p, $= .02$; $M_{P2} = 3.17$, $SD = 1.93$, $p = .51$) sleep ($M_P = 3.92$, $SD = 1.88$; $M_{P1} = 1.58$, $SD =$

2.02, $p = .01$; $M_{P2} = 3.17$, $SD = 2.41$, $p = .17$) or work ($M_P = 3.83$, $SD = 1.59$; $M_{PI} = 1.92$, $SD = 2.23$, $p = .05$; $M_{P2} = 2.92$, $SD = 2.47$, $p = .49$). While participants disagreed that pain made them feel angry, alone, frightened, exhausted, or depressed, none of these reached statistical significance.

Other items in this section elicited opinions about pain reporting (e.g., *I would wait until the pain was really bad before I asked for help*). Participants were somewhat neutral about how much pain they could tolerate, agreed that they would tell someone if they were in pain, and strongly agreed they would ask for pain medication when it was needed. Participants were also in strong agreement that they would like to be involved in pain management decisions and disagreed that they would leave that decision to either the doctor or the nurse. General disagreement was also noted to statements about waiting until the pain was really bad (another word?) before asking for help or that they would rather have pain than the side effects of pain relieving medications.

*There were 15 items relating to *Opinions about Patients' Pain*, one third of them had differences in means that were statistically significant and are also reported in Table 8. The nature of these items related to patients' pain reporting, nurses' pain assessments, and goals for pain management. Participants disagreed with many of the items in this section, but there were four statements that brought agreement, three of which had differences in means after the educational intervention. For example, participants more favorably agreed that pain is whatever the patient says it is ($M_P = 5.50$, $SD = 1.45$; $M_{PI} = 4.17$, $SD = 1.70$, $p = .03$; $M_{P2} = 6.50$, $SD = 1.17$, $p = .12$) and that what a patient said about pain would be true ($M_P = 5.50$, $SD = 1.73$; $M_{PI} = 6.58$, $SD = 0.52$, $p = .03$; $M_{P2} = 6.58$, $SD = 0.67$, $p = .03$). They disagreed that the estimation of

pain by an RN was more valid than patients' reports; however, they agreed that pain could reliably be assessed by behavioral cues or physiological signs.

Participants were of the opinion that patients have a right to expect pain relief and disagreed that patients should expect to suffer some pain. Patient characteristics were also considered and participants' opinions were that age and gender were not factors that influenced the amount of pain a patient experienced. On the other hand, participants held positive opinions that ethnicity was an influence ($M_P = 2.00$, $SD = 1.31$; $M_{P1} = 4.42$, $SD = 1.51$, $p = .04$; $M_{P2} = 4.58$, $SD = 1.24$, $p = .02$). Two other significant differences, one was a change after the educational intervention from a neutral opinion to disagreement (*Patients can sleep in spite of having pain*; $M_P = 4.08$, $SD = 1.73$; $M_{P1} = 2.33$, $SD = 1.23$, $p = .04$; $M_{P2} = 2.33$, $SD - 1.23$, $p = .04$). The other change was from neutral to agreement (*Patients don't like to bother nurses if they are in pain*; $M_P = 4.00$, $SD = 1.62$; $M_{P1} = 5.42$, $SD = 1.51$, $p = .03$; $M_{P2} = 4.92$, $SD = 1.08$, $p = .17$). In a similar vein, participants disagreed that patients would usually tell the nurse if they were having pain.

Table 8

Differences in Mean Scores for the Experimental Group Pretest and Two Posttest Responses[a] to Opinions about Personal Pain and Opinions about Patients' Pain (Scale = 1-7)

Survey Item	Pretest		Posttest 1[a]			Posttest 2[b]		
	M	*SD*	*M*	*SD*	*p*	*M*	*SD*	*p*
Opinions about Personal Pain								
If the pain medication didn't work I would tell the doctor	6.75	0.62	5.27	1.67	.03*	5.75	0.87	.02*
Pain affects my ability to move	4.00	2.22	2.08	2.47	.02*	2.58	1.93	.51
Pain affects my ability to sleep	3.92	1.88	1.58	2.02	.01**	3.17	2.41	.17
Pain affects my ability to work	3.83	1.59	1.92	2.23	.05*	2.92	2.47	.49
Normally, I do not take pain relieving medications	3.67	2.23	5.58	1.44	.02*	5.58	1.38	.02*

(table continues)

Survey Item	Pretest		Posttest 1[a]			Posttest 2[b]		
	M	*SD*	*M*	*SD*	*p*	*M*	*SD*	*p*
I would leave it to my nurse to decide about my pain medication	2.42	1.38	3.75	1.55	.03*	3.25	1.49	.40
I would wait until the nurse asked me if I wanted pain medication	1.83	0.72	2.67	1.30	.02*	3.17	1.83	.03*
Opinions about Patients' Pain								
Pain is whatever the patient says it is	5.50	1.73	6.83	.058	.03*	6.50	1.17	.03*
What a patient says about pain is true	5.50	1.73	6.58	0.52	.03*	6.58	0.67	.03*

Note. Both Posttests were compared to the Pretest administered at the beginning of an academic term. [a]Posttest 1 was administered immediately after an educational intervention. [b]Posttest 2 was administered at the end of an academic term. All groups, $n = 12$.

*$p < .05$. **$p < .01$.

The content of the section, *Opinions about Narcotic Analgesia*, had 13 items that elicited opinions about the use of opioid analgesia. There was general disagreement with all but four of the statements. Participants believed it was best to administer the least amount of narcotics to a patient with pain but only slightly agreed that non-narcotic medications should be used first before opioids were administered. They also disagreed that patients should be told to wait until medications were due if they reported pain that persisted after opioids had been administered. Patient characteristics were not a factor (e.g., *Children should not receive narcotic analgesia*, and *Elderly patients should not receive narcotic analgesia*) when deciding whether to administer opioids. Participants also slightly disagreed that opioid analgesia should not be needed for longer than three days postoperatively. Disagreeing that patients would readily ask for opioid analgesia was consistent with participants' opinions in other sections, (e.g., "Patients are reluctant to ask for opioid medications for pain relief"). There were no significant differences in pretest and posttest mean scores in this section.

The final section of the PMS, *Opinions about Administration of Narcotic Analgesia*, was the most lengthy with 35 items. Seven of the items' means reached statistical significance after the educational intervention (see Table 9). Typical items in this section asked about the likelihood and desirability of the effects of opioid analgesia, how much influence others had on their pain management decisions, how often that was considered, and how likely opioids would be administered to patients with pain.

Respondents increased their agreement with the desirability of increased independence ($M_P = 5.42$, $SD = 1.56$; $M_{P1} = 5.92$, $SD = 1.73$, $p = .38$; $M_{P2} = 6.33$, $SD = 1.16$, $p = .02$) and decreased their opinions that addiction was desirable ($M_P = 3.17$, SD

= 2.04; M_{P1} = 1.50, SD = 0.80, p = .03; M_{P2} = 2.08, SD = 1.17, p = .02) after the educational intervention.

Participants indicated they were affected by the type of pain the patient was experiencing (M_P = 5.42, SD = 1.88; M_{P1} = 2.33, SD = 1.44, p = .01; M_{P2} = 4.58, SD = 2.07, p = .15). The pretest and posttest 1 mean scores were significantly different posttest 2 scores regressed back to pretest levels. The participants were less affected by the route of medication administration over time (M_P = 5.08, SD= 1.08; M_{P1} = 3.92, SD = 2.11, p = .12; M_{P2} = 4.00, SD = 1.65, p = .02).

While increased comfort, independence, and mobility were considered likely and desired outcomes of opioid analgesia, only the likelihood that increased mobility would occur reached statistical significance (M_P = 4.83, SD = 1.27; M_{P1} = 5.58, SD = 1.17, p = .18; M_{P2} = 5.92, SD = 0.67, p = .02). Participants agreed that the likelihood of increased comfort, mobility, and independence would occur and disagreed that the likelihood of addiction, untoward side effects, and inadequate pain relief would occur.

Subjective norm referents included the patient, the patient's family, the nursing unit, nursing colleagues, and the medical staff. In general, the participants agreed that referents would think nurses should administer opioid analgesia and were likely to go along with the referents' wishes. At posttest 1, there was a statistically significant difference in means related to the effect of the nursing unit on the decision to administer opioid analgesia as compared to the pretest but that regressed at posttest 2 (M_P = 4.67, SD = 1.59; M_{P1} = 3.17, SD 1.59, p = .05; M_{P2} = 4.42, SD = 1.38, p = .56). Study participants indicated they would be likely to try to administer opioid analgesics (M_P = 4.50, SD = 1.31; M_{P1} = 4.83, SD = 1.85, p = .53; M_{P2} = 5.42, SD = 0.90, p = .02) and

that it would be easy to do so. A similar question asked how likely they would be to actually administer opioids and the participants responded positively; they also felt that administering opioid analgesia was within their control.

There was only 1 month between the intervention posttest and the second posttest. Wilcoxon tests were run on the data from all sections of the survey instruments. As expected, there were no significant differences in mean scores between the two test times.

Table 9

Differences in Mean Scores for the Experimental Group Pretest and Two Posttest Responses[a] to Opinions About the Administration of Narcotic Analgesia (Scale = 1-7)

Survey Item	Pretest		Posttest 1[a]			Posttest 2[b]		
	M	*SD*	*M*	*SD*	*p*	*M*	*SD*	*p*
How desirable is increased independence	5.42	1.56	5.92	1.73	.38	6.33	1.16	.02*
How much effect does the type of pain have	5.42	1.88	2.33	1.44	.01**	4.58	2.07	.15
How much effect does the patient's condition	5.25	1.27	2.75	1.91	.02*	4.42	1.78	.12
How much effect does the route have	5.08	1.08	3.92	2.11	.02*	4.00	1.65	.02*
How likely is it the patient will have increased mobility	4.83	1.27	5.58	1.17	.18	5.92	0.67	.02*
How likely are you to try to administer narcotics	4.50	1.31	4.83	1.85	.53	5.42	0.90	.02*
How desirable is addiction	3.17	2.04	1.50	0.80	.02*	2.08	1.17	.03*

Note. Both Posttests were compared to the Pretest administered at the beginning of an academic term.

[a]Posttest 1 was administered immediately after an educational intervention. [b]Posttest 2 was administered at the end of an academic term. All groups, $n = 12$.

*$p < .05$. **$p < .01$.

Hypothesis 3. There will be a difference in posttest scores measuring attitudes regarding pain and pain management between the experimental group and the control group. This hypothesis was supported.

To compare the posttest scores of the experimental and control groups, the original number of 38 students in the control group was reduced to the same number in the intervention group. Twelve participants from the control group were matched as closely as possible with the 12 participants from the intervention group based on demographic variables of gender, age, marital status, work status, educational level, ethnicity, and religious preference. Posttest data analysis for the matched pairs was conducted using Wilcoxon tests. There were few statistically significant findings in this analysis; see Table 10 for results from all survey sections.

In the section, *Opinions about Pain*, the mean scores of the participants in the experimental group tended to be higher than in the control group. Those participants agreed that pain prevented a person from enjoying social activities, pain could be made worse by thinking about it, that relaxation helped pain coping, and that it was possible to learn to manage pain. They strongly agreed that being free from pain is important. This finding was the same opinion expressed in the pretest. Opinions from the control group revealed stronger agreement that depression makes pain worse, that pain is a sign of illness, and that it is possible to influence the amount of pain one feels. The students in the control group also agreed that pain was the result of tissue damage; this finding was statistically significant ($M = 5.75$, $SD = 1.55$, $p = .01$). Conversely, the students in the experimental group disagreed with this statement and had lower posttest mean scores for this item, which reflects information learned in the educational intervention.

Analysis of the responses to the items in the *Opinions about Pain Relief* section revealed higher mean scores for the control group overall. They had more concerns about side effects of opioid analgesia than students had in the experimental group and had a more neutral opinion that injections were painful. Participants in the experimental group had slightly higher mean scores, although still in disagreement with the survey items, indicating that doctors and nurses would find it annoying to be told about pain, that addiction was a danger for patients who received opioid analgesics, and that opioid analgesics should not be used until really needed. While participants in both groups disagreed that it was important to be stoic about pain, a higher mean score in the experimental group was statistically significant ($M = 2.17$, $SD = 1.47$, $p = .03$).

There were no statistically significant differences in mean scores found in the *Opinions about Personal Pain* section. However, in general, the participants in the control group had higher mean scores on a majority of the items. They strongly agreed that they would like to be involved in the decision-making about their pain medications and agreed that, if the medication did not work, they would tell the doctor. Participants in the experimental group were more willing to ask for an opioid analgesic when it was needed and were more likely to tell the nurse, rather than the doctor, if the pain medication did not provide relief. Participants in the control group were more likely to take pain-relieving medications than participants in the experimental group were. When compared to their counterparts, those in the experimental group were in higher disagreement that pain affected them physically and psychologically.

In the next section, *Opinions about Patients' Pain*, participants in the experimental group had higher opinions that patients told the truth about their pain and

that pain was whatever the patient said it was. This finding would be expected from those who attended the educational intervention. On the other hand, the participants in the control group indicated higher agreement that patients had a right to expect total pain relief as a goal of treatment. Both groups disagreed that pain was affected by patient characteristics of age or gender, but were less certain about ethnicity as a factor. Interestingly, students in the experimental group were more inclined to have opinions that pain could be reliably assessed by observing patients' behavior despite the educational intervention content to the contrary; this finding was statistically significant ($M = 4.75$, $SD = 1.36$, $p = .03$). Also statistically significant was the opinion among participants in the control group that patients could sleep in spite of having pain ($M = 4.75$, $SD = 1.77$, $p = .01$) whereas participants in the experimental group more strongly disagreed with this statement.

No statistically significant differences were found in mean scores in the *Opinions about Narcotic Analgesia* section. All means in this section were near the neutral point or below indicating disagreement with the survey items. Those in the experimental group had the lowest mean scores for all but two items. Overall, the participants disagreed that opioid analgesia should be withheld from children, the elderly, and patients with a history of drug addiction. They also disagreed that patients would not ask for opioid analgesics and agreed that patients should not have to wait until medication was due if pain persisted despite the administration of opioid analgesics or if breakthrough pain occurred. Mean scores were more concentrated around the neutral point of the Likert scale for the three statements that indicated patients should be encouraged to have non-narcotic rather than narcotic analgesics, that

non-narcotics should be used first, or that the least amount of narcotic analgesic should be administered for pain relief. This finding would be consistent with inexperienced nursing students without a pharmacology course or clinical experience.

In the final section, the participants in the control group were more in agreement with the survey items and several mean scores were found to be statistically significant (see Table 10). The participants in this group were more likely to administer opioid analgesics ($M = 6.17$, $SD = 0.84$, $p = .03$), had stronger opinions about control over the administration of opioid analgesia, expressed higher opinions that the likelihood of positive outcomes of analgesia would occur, that referents would want them to administer opioid analgesics, and that they would go along with the wishes of the referents. In particular, they were likely to be influenced by their nursing colleagues ($M = 5.83$, $SD = 0.72$, $p = .05$) and often considered nursing unit expectations ($M = 6.17$, $SD = 0.72$, $p = .04$) prior to administering opioid analgesia. In addition, the participants in the control group were in more agreement that they intended to administer opioid analgesia ($M = 6.08$, $SD = 0.79$, $p = .02$) and that it would be easy for them to do so ($M = 6.58$, $SD = 0.52$, $p = .04$).

Table 10

Differences in Means for Experimental and Control Group Posttest Responses to the Pain Survey and the Pain Management Survey (Scale 1-7)

	Survey Item	Group A[a]		Group B[b]		
		M	*SD*	*M*	*SD*	*p*
1.	How easy would it be for you to administer narcotic analgesia	5.58	1.38	6.58	0.52	.04*
2.	How likely are you to try to administer narcotic analgesia	5.42	0.90	6.08	0.79	.02*
3.	How likely would you be to give a narcotic analgesia prescribed for pain	5.42	1.00	6.17	0.84	.03*
4.	How likely are you to go along with the wishes of your nursing colleagues	5.08	0.72	5.83	0.72	.05*
5.	I intend to administer narcotic analgesia	5.08	1.56	6.50	0.91	.05*
6.	How often do you consider nursing unit expectations	5.00	1.35	6.17	0.72	.04*

(table continues)

	Survey Item	Group A[a]		Group B[b]		
		M	*SD*	*M*	*SD*	*p*
7.	Patients' pain can be reliably assessed by their behavior	4.57	1.36	3.08	1.56	.03*
8.	Pain is the result of tissue damage	3.92	2.31	5.75	1.55	.01**
9.	Patients can sleep in spite of having pain	2.33	1.23	4.75	1.77	.01**
10.	It is important to be strong by not talking about pain	2.17	1.47	1.17	0.339	.03*

Note. [a]Experimental group (n = 12); [b]Control group (n = 12).

*$p < .05$. **$p < .01$.

Hypothesis 4: There is no difference between the demographic variables of age, gender, marital status, educational preparation, ethnicity, or religious preference and intention to administer opioid analgesics. This hypothesis was supported.

None of the demographic variables were significantly correlated with intention to administer opioid analgesia. The TPB construct of intention was developed according to the method used by Edwards et al. (2001) and is described in detail under the discussion of Hypothesis 5. Pearson correlations are reported here for the aggregate sample ($n = 89$) and for the two posttest groups ($n = 24$). Results of pretest analysis are as follows: gender ($r = -.11, p = .30$), age ($r = .07, p = .54$), marital status ($r = .03, p = .81$), educational level ($r = .08, p = .46$), ethnicity ($r = -.14, p = .19$), and religious preference ($r = -.09, p = .41$); all had little, if any, correlations with intention.

When posttest data were separated into experimental and control groupings, there was little or no correlation of intention with demographic variables, although the r values were slightly higher in the control group in all variables except ethnicity. All r values were below .25 in both groups indicating little, if any, correlation.

Hypothesis 5: Intentions to administer opioid analgesia for pain will be correlated with attitudes, subjective norms, and perceived volitional control, the constructs of the TPB. This hypothesis was supported.

The TPB construct variables were developed according to the methods described by Fishbein and Ajzen (1975) for the Theory of Reasoned Action, the precursor to Ajzen's (1991) Theory of Planned Behavior. First, the Likert scale measurements of 1 (extreme negative pole) to 7 (extreme positive pole) of the PS and PMS were converted to a -3 (extreme negative pole) to +3 (extreme positive pole) in accordance with the

TPB model. Next, the construct variables of intention, direct attitudes, indirect attitudes, subjective norm, direct control, and indirect control were developed.

The behavioral intention component of the TPB was measured from three questions that directly concerned the likelihood of the respondent administering an opioid analgesic (e.g., *How likely would you be to give a narcotic analgesic prescribed on a PRN [as needed] basis to a patient who has pain?*). The overall intention score was calculated by the addition of the participant scores for the three survey items.

The direct attitude component of the TPB was measured from the nine items identified by Edwards et al. (2001) when the PMS was developed. Those items are shown in Table 11. Participant scores from this set of items were then summed for the overall direct attitude score.

Indirect attitudes were measured from two groups of survey items. The first group related to the likelihood of three positive patient outcomes (e.g., *How likely is it that the patient will have increased comfort?*) and two negative patient outcomes (e.g., *How likely is it that the patient will have inadequate pain relief?*) after opioid analgesic administration. The second group related to the desirability of those consequences (e.g., *How desirable is it that the patient will have increased comfort*, *How desirable would inadequate pain relief be for a patient who has received PRN narcotic analgesia?*). To measure this component of the TPB, each item's score in the first group was multiplied by the corresponding item score in the second group. The products of these items were then summed for the overall indirect attitude score.

Table 11

Direct Attitudes about Opioid Analgesics and Pain Relief

1.	Patients with a history of narcotic addiction should not be given narcotic analgesics for pain.
2.	If a narcotic analgesic is ordered every 4 hours, nurses should instruct patients who report pain during that 4 hours to wait until the medication is due.
3.	In general, children should not receive narcotic analgesia for pain relief.
4.	It is best to administer the least possible amount of narcotic analgesia.
5.	In general, elderly patients should not receive narcotic analgesia for pain relief.
6.	Narcotic analgesia should not be required for longer than 3 days postoperatively.
7.	It is usually best to start off administering non-narcotic analgesia when trying to relieve pain of any type.
8.	In general, patients should be encouraged to have non-narcotic rather than narcotic analgesia for pain.
9.	Addiction is likely to occur as a result of treating pain with narcotic analgesics.

The construct subjective norm related to the referents of patients, patients' families, nursing colleagues, and medical staff as the social pressures that might influence the administration of opioid analgesics. Again, the survey items were separated into two groups. The first group elicited opinions about the likelihood these referents would think that opioid analgesia should be administered (e.g., *In general, how likely is it that the patient would think that you should administer PRN narcotic analgesia?*). The second group asked how likely the respondent would comply with the wishes of the referent (e.g., *In general, how likely are you to go along with the wishes of the patient?*). To measure this component of the TPB, each item score in the first group was multiplied by the score of the corresponding item in the second group. The products of these items were then summed for the overall subjective norm score.

Direct (i.e., volitional) control referred to the ease or difficulty of administering opioid analgesia based on extrinsic factors. To measure direct control, the scores from three items were added for an overall construct score (e.g., *Administering PRN narcotic analgesia to a patient with pain is within my control*).

Indirect control related to beliefs about the influence of nursing unit expectations, route of opioid administration, the type of pain the patient was experiencing, the patient's condition, and patient characteristics (e.g., age, gender, ethnicity). Two groups of items measured this construct. The first asked how much effect those extrinsic factors had on the respondents' decision to administer opioid analgesics (e.g., *How much effect does the patient's condition have on whether you administer PRN narcotic analgesia to a patient with pain?*). The second asked the respondents how often they would consider those factors (e.g., *How often would you*

consider the patient's condition prior to administering PRN narcotic analgesia to a patient with pain?). The indirect control construct was computed by multiplying the corresponding items from the two groups and the scores of the products were added together for an overall score.

Results from analysis of pretest and posttest data are discussed here. Initial data analysis showed several significant correlations ($p \leq .05$). Green and Salkind (2005) recommended using the Bonferroni approach when this occurs to control for a Type I error across the correlations. The Bonferroni approach requires dividing the level of significance, .05 in this study, by the number of computed correlations. In this study, a p value of less than .004 (.05 / 12 = .004) was required for significance.

In the aggregate pretest group ($n = 89$), low to moderate correlations of intention with the constructs of direct attitude (r [87] = -.68, $p < .01$), direct control (r [87] = .50, p = .05), indirect attitude (r [87] = .42, $p = .09$), and subjective norm (r [87] = .46, p = .06) were found. Indirect control had little correlation (r [87] = .24, $p = .22$) with intention to administer opioid analgesia. The finding of little or no correlation for indirect control was similar to that in Edwards et al.'s (2001) study.

Posttest data were also analyzed and a correlation matrix can be seen in Table 12. The experimental and control groups ($n = 24$) were combined for initial analysis. High correlations were found for intention and the constructs of direct control (r [22] = .70, $p <.001$) and direct attitude (r [10] = -.72, $p <.001$) and were statistically significant. Subjective norm (r [22] = .58, $p = .003$) was also statistically significant but was only moderately correlated with intention. Indirect attitude (r [22] = .52, $p <.01$)

was moderately correlated but not statistically significant. Indirect control (r [22] = -.32, p = .12) had low, negative correlation with intention.

Table 12

Posttest Correlations among the Five Theories of Planned Behavior Constructs

	Intention	Direct Attitude	Indirect Attitude	Subjective Norm	Direct Control	Indirect Control
Intention						
Direct Attitude	-.720***					
Indirect Attitude	.524	-.319				
Subjective Norm	.578**	-.445	.666**			
Direct Control	.698***	-.455	.462	.564**		
Indirect Control	-.324	.218	.095	.145	-.133	

Note. Includes experimental group and control group participants (n = 24).

**p <.01. ***p < .001. A Bonferroni approach was used, the significance level was determined to be .004.

To analyze posttest data further, it was divided for individual experimental and control group analysis. Correlations were notably different in the experimental group (n = 12) than in the control group (n = 12). In the experimental group, direct control (r [10] = .89, p <.001) was highly correlated and statistically significant, direct attitude (r [10] = -.74, p < .01) was also highly correlated but not statistically significant with intention to administer opioid analgesics. The constructs of subjective norm (r [10] = .40, p = .19) and indirect attitude (r [10] = .27, p = .39) had low correlations with intention in this group while indirect control (r [10] = -.14, p = .67) had little correlation. Participants in this group had stronger intentions to administer opioid analgesia when attitudes were positive and control was perceived. Subjective norm referents were less influential.

None of the correlation coefficients in the control group was statistically significant. In this group, the TPB constructs subjective norm (r [10] = .70, p = .01) and indirect attitude (r [10] = .76, p <.01) were highly correlated; direct attitude (r [10] = -.68, p = .02) and direct control (r [10] = .50, p = .10) were moderately correlated. As in the experimental group, low correlation was noted for indirect control (r [10] = -.25, p = .44). Participants' intentions to administer opioid analgesia in this group were strongly influenced by external referents and the likelihood or desirability of the analgesia outcomes and less influenced by control and direct attitudes.

Supplemental Data Analysis

Predicting Intention. Using Ajzen's (1991) theory about attitudes as a predictor of behavior, the constructs of the TPB were further analyzed. Edwards et al. (2001) stated that these constructs had not always been important considerations for nurses who managed pain, but they did contribute to attitudes and ultimately behavior.

Intention to administer opioid analgesics, then, could be predicted by beliefs and attitudes about pain and pain management, subjective norm or the social pressures that influenced behavior, and volitional control, even if the nursing students who participated in this study had little or no prior patient care experience. To test, Ajzen's (1991) theory, a multiple regression analysis was conducted. The purpose of a multiple regression is to determine how well scores on the dependent variable, intention to administer opioid analgesia, can be predicted from data on the independent variables (Huck, 2000); the five remaining TPB constructs.

A backward technique was used for data analysis. Using this method, the variables are unordered and all are included in the first equation for the overall R^2 statistic (coefficient of determination), then one independent variable is eliminated sequentially to see if the R^2 drops significantly. The least significant independent variable is removed and the remaining variables remain in the equation to be tested. The process continues until the highest $R^2$is achieved. If the regression ANOVA is significant, all remaining variables would stay in the equation (Munro, 2001).

The first multiple regression analysis was conducted on the pretest data to predict the intention to administer opioid analgesics by all the participants ($n = 89$). Results indicated that the five independent variables ($R^2 = .18$, $F\,(5, 83) = 3.56$, $p = .006$) accounted for 18% of the variance. The strongest predictor variable was direct control ($R^2 = .16$, $F\,(1, 87) = 16.01$, $p < .001$) and accounted for 16% of the variance. The other independent variables were noncontributory. As may be expected from entry-level nursing students, the prediction of intention to administer opioid analgesia is low among the participants in this sample.

A second multiple regression analysis was conducted on the posttest data. From this data set ($n = 24$) the results were much different. In this analysis, the five independent variables ($R^2 = .82$, $F\,(5, 18) = 15.84$, $p < .001$) accounted for 82% of the variance. The backward model dropped the variables of indirect control, indirect attitude, and subjective norm as noncontributory leaving direct attitude and direct control ($R^2 = .79$, $F\,(2, 21) = 40.49$, $p < .001$) in the final step. These two variables were significant, accounted for 79% of the variance, and were good predictors of intention to administer opioid analgesia for pain. One might expect participants' intentions to be higher after the structured educational intervention.

Table 13 provides summary data for each of the TPB construct. Included in the table is the mean and standard deviation for each construct along with the possible range of scores. The original Likert scale of 1 (extreme negative opinions) to 7 (extreme positive opinions) from Section 3 of the PMS was converted to a scale of -3 to +3, as Ajzen (1991) suggested in his methodology, to evaluate the degree of attitudes. Hence, the possible scores range from negative to positive numbers based on the number of items that comprised the construct. Edwards et al. (2001) constructed a similar table in their published study and computed Cronbach's alpha coefficients for each construct following their factor analysis at the time the PMS was developed. Cronbach's alpha, or simply alpha, is a versatile technique used as a method to assess reliability of internal consistency when a survey item has three or more scoring values (Huck, 2000). It is appropriate to use for this study because the survey instruments had a Likert scale with seven possible responses. Alpha coefficients in this study were found to be moderate. The alpha coefficients in this study are similar to Edwards et al.'s (2001) findings,

except for the indirect attitude construct. Edwards et al. noted that the coefficients for belief-based measures might not be internally consistent because of the wide range of beliefs held by individuals. Lower mean scores in this study may reflect the inexperience of nursing students as opposed to the practicing nurses in Edwards et al.'s study.

A predictive model of intention. Edwards et al. (2001) developed a model to predict the intention of nurses in their study to administer p.r.n. opioid analgesia to patients with pain. The model depicts Ajzen's (1991) TPB constructs and how well the independent variables of direct attitude, indirect attitude, subjective norm, direct control, and indirect control correlated with the dependent variable of intention. The researchers used a standard multiple regression to build the model.

The same technique was used in this study. Standard multiple regression was used to determine the correlations of the five independent constructs with the dependent construct of intention. The correlation of each of the constructs with intention is included in the model (see Figure 1). Seventy-six percent of the variance (R^2= .763, F [5, 18] = 11.59, $p < .01$) in intention scores was explained by the five independent constructs. The strongest predictors of intention were direct attitude (r = -.72, $p < .001$) and direct control (r = .84, $p < .001$). The subjective norm (r = .47, p = .01), indirect control (r = -.25, p = .12), and indirect attitude (r = .44, p = .02) constructs were contributors but not statistically significant when the Bonferroni technique was used. Results suggested that the participants in the posttest group had a higher intention to administer opioid analgesia than the pretest participants were. It could be presumed that

the educational intervention gave entry-level students more confidence in their ability to manage pain when they perceived control and had positive attitudes.

Table 13

TPB Construct Scales from the Pain Management Survey

Variable	*M*	*SD*	Possible Range	α
Direct attitude	19.63	10.29	-27 - 27	0.77
Subjective norm	10.0	8.50	-36 - 36	0.77
Intention	5.42	2.70	-9 - 9	0.68
Direct control	5.04	2.76	-9 - 9	0.67
Indirect control	1.13	15.01	-45 - 45	0.63
Indirect attitude	-4.49	10.27	-45 - 45	0.82

Note. Data is from the posttest sample ($n = 24$).

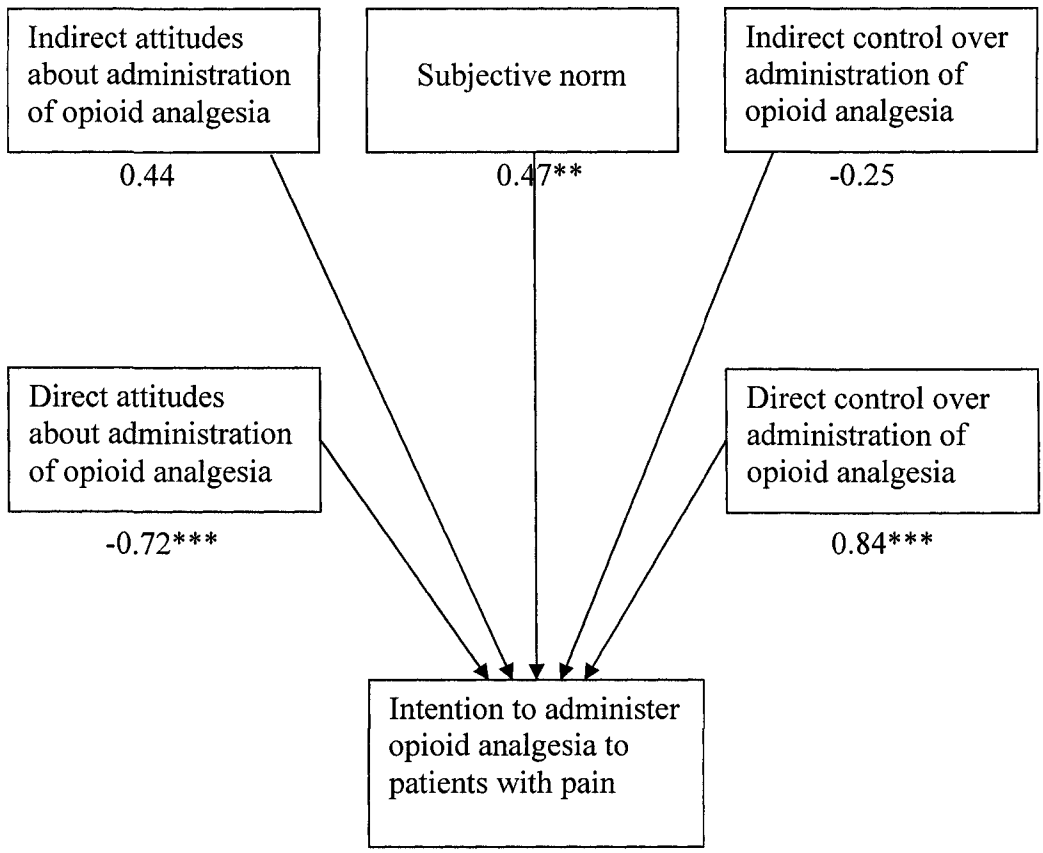

Figure 1. Predictive Model of Nursing Students' Intention to Administer Opioid Analgesia

Note. Correlations of the independent variables with the independent variable at posttest ($n = 24$).

$^{**}p < .01$. $^{***}p < .001$.

Summary

In this chapter, the results of the data analysis were presented. First, a description of the sample was presented. Second, inferential statistics related to testing the research hypotheses in the aggregate sample, comparisons of the pretest experimental and control groups, and comparisons between the posttest groups were described. Supplemental data analyses were presented next and included results of a multiple regression of the TPB constructs on intention to administer opioid analgesia. Finally, a model was constructed to illustrate the variables predicting nursing students' intention to administer opioid analgesia.

Chapter 5

Summary, Discussion, Implications for Nursing and Conclusions

In this chapter, a summary of the research design and method are discussed including the purpose, conceptual framework, data collection with analyses, and an overall summary of the study results. The following is a discussion of the relevant findings related to the hypotheses followed by the study limitations. Implications for nursing practice, education, and research are discussed next. Lastly, conclusions drawn from the study are presented.

Summary of Research Design and Method

The overall purpose of this research was to examine entry-level nursing students' knowledge and attitudes regarding pain and the administration of opioid analgesics for pain management. A quasi-experimental research design was used for this study. Two groups of students were recruited, one as the experimental group who received a structured educational intervention about pain and pain management, the other was the control group. Pretest data was collected from both groups at the beginning of an academic term. Three months later the intervention was offered to the experimental group with a posttest at the end of the session. At the end of the academic term, a posttest was administered to both groups. Data analysis was based on these groupings.

Ajzen's (1991) Theory of Planned Behavior (TPB) was used as the theoretical framework for this study. Believing that social behavior is consciously controlled and deliberate, Ajzen theorized that intention to carry out the action would be a predictor for the action. He further posited that attitudes (e.g., feelings or judgments, whether positive or negative) toward a behavior could predict intention. According to the theory, attitudes arise from beliefs (e.g., cognitive information that is learned) and are determinants of behavior. However, behavior is also influenced by social pressure, what Ajzen termed subjective norm, and perceived volitional control, or how easy or difficult it is to perform the action in terms of extrinsic rather than intrinsic factors. The constructs developed for his theoretical model reflect the tenets of the theory and are predictive of behavior. Those constructs were (a) direct attitudes (e.g., beliefs), (b) indirect attitudes, (c) subjective norm, (d) direct control, and (e) indirect control. In this study, Ajzen's model was tested to predict nursing students' intention to administer opioid analgesics to patients experiencing acute pain.

The following research hypotheses were formulated and addressed:

1. There will be no difference in pretest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.
2. There will be a difference between pretest and posttest scores measuring attitudes regarding pain and pain management in the experimental group after receiving a structured educational intervention.
3. There will be a difference in posttest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.

4. There is no difference between the demographic variables of age, gender, marital status, educational preparation, ethnicity, or religious preference and intention to administer opioid analgesics.
5. Intentions to administer opioid analgesia for pain will be correlated with attitudes, subjective norm, and perceived behavioral control, the constructs of the TPB.

The data collection instruments consisted of the Pain Survey (PS) and the Pain Management Survey (PMS) developed by Edwards et al (2001). The work of these authors was informed by literature reviews concerning beliefs and attitudes about pain, current pain management practices, and the TPB. Each survey was divided into three sections. The sections of the PS elicited demographic information, general opinions about pain, and opinions about pain relief. The PMS sections were divided into opinions about patients' pain, general opinions about opioid analgesics, and opinions about the administration of opioid analgesics. In the latter section, the constructs of Ajzen's (1991) theoretical model guided the development of the survey items.

Data were collected from entry-level nursing students enrolled in two baccalaureate nursing programs in the Pacific Northwest. Data analysis was performed using SPSS for Windows, Version 11.5. Descriptive statistics were used to describe study and demographic variables. Inferential statistics were used to compare the study variables between the two groups of nursing students. To predict intention to administer opioid analgesics, a multiple regression analysis was performed on the TPB constructs.

Results indicated that (a) there were statistically significant differences in pretest scores measuring attitudes about pain and pain management between the experimental

and control groups, (b) there was an improvement in intervention posttest scores measuring attitudes about pain and pain management among the experimental group after a structured educational intervention, (c) there were statistically significant differences in posttest scores measuring attitudes between the experimental group and the control group, (d) there were no significant differences between the demographic variables of age, gender, marital status, work status, educational preparation, ethnicity or religious preference and intention to administer opioid analgesia to patients experiencing pain, (e) intentions to administer opioid analgesia for pain was correlated with direct attitudes, subjective norm, and perceived volitional control, the TPB constructs, and (f) the TPB constructs of direct attitudes, subjective norm, direct control and indirect control were predictive of intention to administer opioid analgesia but indirect attitudes were not predictive.

Discussion

The overall purpose of this research was to examine nursing students' knowledge and attitudes about pain and pain management. The data elicited information about general knowledge of pain and pain management, particularly intention to administer opioid analgesia.

Eighty-nine students from two baccalaureate nursing programs in the Pacific Northwest participated in this study of attitudes regarding pain and pain management, specifically the administration of opioid analgesia. Eighty-three (93.3%) of the participants were female, six (6.7%) were male – reasonably consistent with the proportion of males and females in the profession of nursing. Fifty-one students were in the experimental group at one university, 38 students were in the control group at a

second university. All were entry-level students, however, the participants in the control group were slightly ahead in the nursing program and had several hours of clinical experience in a skilled nursing facility whereas the participants in the experimental group were preparing to do so at the time of the pretest. During the period of the research study over the course of an academic term, both groups attended regular classes in their respective universities and obtained initial clinical experience. Neither group had attended medical-surgical nursing or pharmacology courses. The only formal education provided for this study was the intervention for the experimental group; however, some knowledge of pain and pain management may have been incidentally obtained through classroom discussions or clinical observations.

Ages of the participants ranged from 18 to 54 years, reflecting a mixture of traditional and non-traditional college students. The mean age of all participants was 24.5 years. The youngest participant was in the experimental group, the oldest in the control group. An incidental finding was that the older students were more likely to have either work or homemaking responsibilities outside of their student status. No statistical analysis was performed on this finding. However, increased life experiences may have exposed these students to involvement with persons experiencing pain.

The majority of the participants (82.0%) in the study were not married. Because there were not sufficient numbers of married students represented, no attempt was made to compare differences in opinions between unmarried and married participants.

Education is an important factor when examining attitudes. Ajzen (1991) indicated that beliefs were learned through personal experience or through information from others. In this study, entry-level nursing students were recruited as participants.

The highest earned degree was a demographic variable. High school diplomas (47.2%) and associate's degrees (47.2%) were equally represented among the participants. Only three participants (4.5%) in the total sample had a bachelor's degrees and one (1.1%) had a master's degree. The majority of previous studies conducted with nursing students used upperclassmen that were close to graduation (Allock & Standen, 1998; Allock & Toft, 2003; Chiu et al., 2002; Chuk, 2002; Lasch et al., 2002; Owens, 1999; Weiss, 2002) or compared students with practicing registered nurses (Arthur, 2001; Hamers et al., 1997).

The ethnic composition of the total sample was somewhat diverse but the overwhelming majority of participants (87.6%) were Caucasian. Eleven participants represented four other ethnic groups. Since the representation from the non-Caucasian ethnic groups was small, no attempt was made to conduct data analyses based on ethnic origin.

Religious preferences of the participants in the study were mixed but the majority (n = 57, 64.1%) were Protestant. Eleven percent (n = 10) of the students were Roman Catholic. Five other religious categories were offered as choices; however, 14 (15.7%) students selected a category, *other*, without specifying what that meant, and eight students (9%) indicated they had no religious preference. Religious values provide a framework for beliefs about healing and suffering (Heilman & Witztum, 2000) and may provide meaning for the pain experience and ways of coping with pain. Attitudes about the value of suffering could positively or negatively affect patient care. Again, the number of participants representing possible non-Christian values was too small to

make any comparison about pain attitudes based on religious beliefs. None of the demographic variables was significantly correlated with intent to administer opioids.

Of primary interest in this study were the attitudes of entry-level nursing students regarding pain and their intention to administer opioid analgesics. The two survey instruments used for data collection, the PS and the PMS, were developed by Edwards et al. (2001) and reflected pain management beliefs and practices found in the literature and in clinical guidelines. The final section of the PMS related to the constructs of the TPB used in this study to predict behavior.

Results of the current study are similar to Edwards et al.'s (2001) findings. In general, the nursing students have positive attitudes about pain and pain management but are overly concerned about side effects of opioid analgesia, particularly addiction. This finding is a recurrent theme in the literature. Because they lacked clinical experience, the nursing students in this study were also less confident about their level of control over the administration of opioid analgesics. Statistically significant findings are reported in the discussion that follows.

Hypothesis 1. There will be no difference in pretest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.

Data analysis revealed statistically significant differences in mean scores between the two groups for the pretest. Students in the experimental group had stronger opinions about the possibility of addiction to opioid analgesia than did students in the control group. This finding is consistent with Briggs' (2004) and Weiss' (2002) results that nursing students were also concerned about addiction.

In the current study, students in both the experimental and control groups were at a beginning level in their nursing studies. While the sequences of instruction were different in the two schools of nursing, the fundamental level of experience was equivalent. As previously stated, the control group was slightly ahead in their progression in the nursing program but the differences were negligible. Neither group had taken a medical-surgical nursing course or a pharmacology course. The students in the control group, however, had exposure to caring for residents in a skilled nursing facility prior to the pretest. During the course of the research study, both groups had clinical exposure in long-term care.

There were no previous studies found in the literature that examined nursing students' attitudes and intentions using Ajzen's (1991) TPB and only two studies (Edwards et al., 2001; Jurgens, 1996) were identified that examined nurses' intentions to administer opioid analgesics. Another researcher (Weiss, 2002) used McCaffery and Ferrell's (1987) Nurses' Knowledge and Attitudes Survey (NKAS) to measure students' knowledge, but that instrument only indirectly measured attitudes while Chiu et al (2002) used self-designed instruments that measured students' knowledge of pain physiology and pharmacological treatment of pain. These instruments did not measure intention. Use of the NKAS, however, has been widely reported in the nursing literature as an instrument that measured knowledge and attitudes. The major difference between the NKAS and the PS and PMS was that the NKAS used true/false responses to measure knowledge while the PS and PMS used a Likert scale to quantify attitudes.

Vignettes have also been used in many studies of registered nurses' decision-making over the past several years, more recently with graduating nursing students

(Briggs, 2004; Chuk, 2002). Findings reported in the literature were that nurses relied on behavioral cues or vital signs as indicators of pain. In this study, participants in the experimental group believed pain could be reliably assessed by behavior or vital signs, a statistically significant difference when compared to the opinions of the participants in the control group. Participants in the experimental group also believed that opioid analgesia should not be given to children or elderly patients.

Other statistically significant differences of opinion were found among the participants in the control group. They agreed that pain was whatever the patient says it is (100%) and that the patient would truthfully report pain (100%). They also indicated that they were likely to go along with the wishes of the patient or the medical staff when deciding whether to administer opioid analgesia. Intentions to administer opioids were also stronger in the control group (76.3%) than in the experimental group. Perceptions of control were also higher in the control group (73.3%), while only one-third (33.3%) of students in the experimental group perceived control over administering opioid analgesics. The studies by Briggs (2004) and Weiss (2002) did not address the issues of control and intention, but Edwards et al. (2001) found that the nurses (87%) in their study said it would be likely that they would try to administer opioid analgesia to patients with pain; however, only 74% actually intended to do so.

Hypothesis 2. There will be a difference between pretest and posttest scores measuring attitudes regarding pain and pain management in the experimental group after receiving a structured educational intervention.

In general, mean attitude scores improved for appropriate statements and decreased for inappropriate statements. An example of an appropriate statement was,

Pain is whatever the patient says it is. This was the accepted definition of pain in the nursing literature and was coined by McCaffery in 1979. Researchers have reported that nurses did not always believe what the patient said about pain (Clarke et al., 1996; McCaffery & Ferrell, 1997a, 1997b; McCaffery & Pasero, 1999; Weiss, 2002). Edwards et al. (2001) also reported the nurses in their study had misconceptions that caused them to doubt patients' reports of pain. Hunt (1995) stated that nurses were more disbelieving about a patient's pain than nursing students were.

An example of an incorrect statement was, *There is a real danger of becoming addicted to pain relieving medication*. Addiction has been reported to be low (< 1%) among patients who use opioid analgesia for acute pain management (AHCPR, 1992a; Briggs, 2004; Friedman, 1990; McCaffery & Pasero, 1999), yet nurses continue to be overly concerned about addiction (McCaffery & Ferrell, 1997). Opinions that addiction is a danger was higher among the nursing students in the experimental group (slightly agree) than in the control group (somewhat neutral). This finding might be expected because they had little or no clinical experience or knowledge about pharmacology or pharmacokinetics.

Another significant finding was an increase in mean scores related to the item, *The amount of pain is influenced by ethnicity*. While ethnic background and cultural norms may influence how pain is perceived and reported, there has been no evidence that the amount of pain experienced is different between cultures (Anderson, 2001; Cavillo & Flaskerud, 1993; Lasch, 2000; Ludwig-Beymer, 2003; McCaffery & Pasero, 1999; Zborowski, 1952). There was, however, a difference in how pain reporting or non-reporting was interpreted and treated by health care professionals (Bonham, 2001;

Lee, Gin, & Oh, 1997; Ng, et al., 1996; Todd, et al., 2000; Todd, Samaroo, & Hoffman, 1993).

A statistically significant decrease in mean score was also noted about how much effect the route of administration had on the participants' decisions to provide opioid analgesia. There were many routes of administration, each with its own absorption and bioavailability properties. While oral administration was often the route of choice, other routes are also useful, particularly the intravenous route that provided immediate analgesic effect (AHCPR, 1992a; Lewis et al., 2004; McCaffery & Pasero, 1999). Entry-level nursing students would unlikely be well informed about the various routes or drug dosages, side effects, and risks that differed among delivery methods without a course in pharmacology or clinical observation of pain management.

Hypothesis 3. There will be a difference in posttest scores measuring attitudes regarding pain and pain management between the control group and the experimental group.

In general, posttest mean scores were higher for both groups than the pretests for many items. There were a few significant differences in mean scores between the experimental and control groups at the time of the posttest at the end of the academic term. For the items with a negative connotation (e.g., *There is little that can be done to ease the pain you feel*), mean scores were slightly lower in both groups. One of the surprising differences was that the control group rated pain as the result of tissue damage much higher than their pretest scores. The mean score for the experimental group was lower for this item than the pretest, which was expected. The AHCPR

(1992a) and the IASP (1979, 1994) give actual or potential tissue damage as a definition of pain, but McCaffery's (1979) definition has been more widely used in nursing.

At posttest, both groups had lower mean scores for behavioral cues as a reliable pain assessment measure than on the pretest. The difference between the experimental and control groups was statistically significant with the experimental group having the higher score; however, the mean score was lower than the Posttest 1 score immediately after the educational intervention The AHCPR (1992b) guidelines clearly state that "observations of behavior and vital signs should not be used instead of a self-report unless the patient is unable to communicate" (p. 7). Both groups strongly agreed that the patient report was the best indicator of pain.

Opinions as to whether a patient could sleep despite having pain were more neutral in the control group and low in the experimental group. The difference, however, was statistically significant. The mean score for the control group was essentially unchanged from the pretest mean score but decreased in the experimental group. While some patients might have difficulty sleeping when in pain, for others it is a coping mechanism (McCaffery & Pasero, 1999). When responding to this question, the nursing students in the sample may have drawn from personal experience rather than knowledge about the various ways individuals cope with pain.

Being involved in the decision-making process for pain management was important to participants in both groups. Partnership in patient care is an important concept in nursing. Lewis et al. (2004) stated that it was important for nurses to determine what the patient's perception of need was and to meet the patient's priority need. Patients had a right to expect prompt pain management (JCAHO, 1999), but also

wanted to be involved in decisions about their care. The students who participated in the study might have learned the concept of the patient as a partner in care decisions in a nursing fundamentals course.

Hypothesis 4: There is no difference between the demographic variables of age, gender, marital status, educational preparation, ethnicity, or religious preference and intention to administer opioid analgesics.

All the demographic variables had little or no correlation with intention in this study. However, in the total sample, age had a high correlation with marital status and a low correlation with educational level. Correlations for the remainder of the demographic variables were insignificant. It is unknown whether Edwards et al. (2001) or Jurgens (1996) tested correlation of the demographic variables with intention.

Hypothesis 5: Intentions to administer opioid analgesia for pain will be correlated with attitudes, subjective norm, and perceived control, the constructs of the TPB.

Correlations for the constructs of the TPB rose from the pretest analysis. Four of the five construct correlations reached statistical significance: direct control and direct attitudes were highly correlated with intention, subjective norm and indirect attitudes were moderately correlated, and indirect control had a low correlation with intention. The correlations were higher at posttest in the experimental group than in the control group. This finding provided evidence that attitudes were appropriately change during the educational intervention and more directly linked to intention to administer opioid analgesia to patients with pain.

Predicting behavior from attitudes. Multiple regressions were calculated to predict intention to administer opioid analgesia based on attitudes, subjective norm, and perceptions of volitional control. Using a stepwise regression, direct control and direct attitudes were found to have the strongest effect. When standard regression was used, results were similar to Edwards et al.'s (2001) findings although, in this study, 42% of the variability in students' intention at the pretest was attributable to the TPB constructs as opposed to 39% in Edwards et al.'s study. When a standard regression was conducted after the posttest, the variance rose to 76.3%. Edwards et al. found these same construct variables to be predictive of intentions to administer opioid analgesia to patients with pain. In this study, the remaining 24% of unexplained variance could be due to previous personal pain experiences, increased level of knowledge attained over the course of the academic term, observations made in clinical nursing practice, or an interaction of these and other unknown variables.

Study Limitations

There are major limitations associated with this study. First, the nursing students in the experimental group and the control group were at slightly different phases in their nursing programs. Since the control group was slightly ahead of the experimental group, this may have had an effect on the overall responses to the survey items. Second, the number of students in attendance at the educational session for the experimental group was far short of expectations. Because the group was so small ($n_e = 12$), results may not be representative of the opinions of the experimental group as a whole. Therefore, results may be skewed despite efforts to match 12 participants from the control group with the 12 attendees for the posttest data analysis. Third, there is no assurance that the

opinions reported in the surveys are the actual opinions of the nursing students who participated in the study. Fourth, no attempt was made to control the test-taking environment. Students voluntarily stayed after class to complete the surveys but may have had other distractions that might have influenced the time or the way in which they responded. Finally, results could not be generalized to nursing students as a whole because the samples in this study design were obtained from private universities with religious affiliations.

Implications for Nursing

Nursing practice. "Nursing is a reflection of the society in which it is practiced" (Schlub & Martsolf, 1999, p. 15). Societal views about pain (Harris & Associates, 1999; Hart & Associates, 2003; Partners Against Pain, 2001) can shape attitudes about how pain is reported and how it should be treated (Dalton et al., 2001; Lewis et al., 2004; McCaffery & Pasero, 1999).

Dooks (2001) stated that pain management was a prime example of a research-practice gap. According to Ashford et al. (1999), there was a mismatch between ideal nursing practice and what was actually practiced. There is a need for nurses to use the best evidence for clinical practice; however, innovations have been implemented slowly, generally because they require a significant change in behavior or thinking. In other words, a major paradigm shift is needed about pain management.

Inappropriate attitudes about pain and the use of opioid analgesics need to be addressed. It is essential that nurses examine their own beliefs and attitudes about pain and accept evidence-based practices for pain management. One way to accomplish this is through continuing education, either formal (e.g., in-services, workshops) or informal

(e.g., self-learning modules). Cason et al. (1999) suggested that pain treatment could be a part of annual competency evaluations. Pain management education could produce behavior change but that education must be continually reinforced (Cason et al., 1999; Clarke et al., 1996; Dalton, Carlson, Mann, Blau, Bernard, & Youngblood, 1998; Knoblauch & Wilson, 1999). It is important that practicing nurses stay informed of current pain management guidelines and therapeutic modalities, incorporating them into daily practice.

Nursing education. Based on the current research evidence, the mandate for improved pain management education is clear. Numerous authors cited elsewhere in this paper have stated that nurses have inadequate knowledge about pain management.

Education of nursing students directed at the current practices in pain management is essential if a paradigm shift is to take place. Teaching students about their responsibilities for pain management should start near the beginning of a nursing curriculum, thus ensuring knowledge and attitudes about pain are developed early (Francke, Lemmens, Abu-Saad, & Grypdonck, 1997; McCaffery & Ferrell, 1997). Course content should reflect current pain management guidelines. This study examined entry-level nursing students' attitudes about pain and could serve as a starting point for content to be included in the courses where pain management is taught.

According to available research, schools of nursing inadequately prepare their students in the care of patients experiencing pain. Pain content is given too little emphasis (Ferrell et al., 1993; Graffam, 1990; Lasch et al., 2002; Staake, 1998), faculty are inadequately prepared to teach it (Ferrell et al.; Lasch et al.), and often textbooks are incorrect or outdated (Ferrell et al., 2000; McCaffery & Ferrell, 1997). Nursing students

need a sound theoretical foundation about pain and pain management to prepare them for patient-centered care in clinical practice. Along with the theoretical foundation, nursing students also need a strong knowledge base in pharmacology (Bullock & Manias, 1998) to be better able to manage patient's pain. Subsequently, this knowledge must be translated into practice.

Practicing nurses must be good role models for nursing students. Students may learn *ideal* practice but can become disillusioned when *actual* practice does not reinforce their theoretical learning. Fothergill-Bourbonnais and Wilson-Barnett (1992) and Clarke et al. (1996) suggested that the working environment was the most influential experience for nursing students learning about pain management.

Along with knowledge-based education, an attitude change may be a necessity. Jurgens (1996) suggested "efforts should be directed at making nursing students aware of their attitudes toward pain management and the potential effects of these attitudes on their practice and, ultimately, in the pain experienced by their patients" (p.90). Correcting misconceptions and inappropriate attitudes should also be an integral part of the students' learning process.

This research explored the attitudes of nursing students regarding pain and pain management. Conclusions from the results of the data analysis indicate that there are misconceptions about patients' pain reporting and exaggerated concerns related to the administration of opioid analgesics; these issues need to be addressed.

Nursing research. Driever (2002) described evidence-based practice as "derived from the synthesis of knowledge from research" (p. 593) that is integrated into nursing care. However, research utilization has been slow, perhaps due to a lack of a positive

research culture in clinical settings (Retsas, 2000). Retsas indicated that the nurses he studied felt research results were not applicable to their clinical setting. This statement has important implications for nursing research. Research findings should be clear, simple, and easy to understand and remember (Hicks & Hennessey, 1997).

Nurses' knowledge and attitudes regarding pain and pain management have been well studied but continued research is needed to explore why discrepancies in pain management practices still exist. Further research is also needed to explore the attitudes of nursing students regarding pain and pain management. Replicating this study in a larger population of nursing students is recommended. One study is not conclusive as to the general attitudes of nursing students about pain management and a broader base is needed for comparison. Random assignment of student volunteers would also make generalization of research findings more feasible

In addition, a longitudinal study using the TPB theoretical model with a cohort of students would be beneficial to monitor changes in attitudes toward pain and opioid analgesia as students progress through a nursing program. Reinforcement of early learning is important. Chiu et al. (2003) found that the level of pain knowledge was low among senior-level nursing students. A longitudinal study would allow comparison of the beliefs and attitudes at entry into and exit from the nursing program.

Since studies using the TPB to examine intention to administer opioid analgesia are few in number, a comparison study could be conducted between nursing students and nurses who are established practitioners. The students recruited for the experimental group this study attend clinical rotations in a Designated Education Unit (DEU) at a local hospital. This unit caters to students; staff accepts positions the unit with the

knowledge that they will be preceptors and role models for nursing students. A comparison of the attitudes between the DEU nurses and the students could be a worthwhile study.

Faculties in nursing programs are also role models. It has been nearly a decade since Ferrell et al. (1996) surveyed nursing faculty regarding pain and pain management knowledge and beliefs. Conducting a similar study would provide more current information regarding faculty knowledge and beliefs about the pain content they teach. A companion study could be done to survey schools of nursing regarding the nature and number of hours that pain content is presented in the curriculum.

In 2000, Ferrell et al. analyzed 50 textbooks for pain-related content. Since new textbooks are periodically updated, a replication of this study is recommended. Targeted textbooks would be those used for nursing fundamentals, pharmacology, medical-surgical (adult and pediatric), obstetric, and psychiatric nursing courses. If the pain content in these texts is not current or adequate, nursing students will receive incomplete information.

Summary of Recommendations for Further Research

The research-practice gap. Nurses have cared for patients experiencing pain in nearly every clinical setting. Pain accompanies a variety of illnesses, procedures, and conditions. Knowledge and attitudes regarding pain can significantly influence the treatment of pain and patient outcomes. Based on the literature, nursing practice and nursing education have not kept pace with pain research and established protocols (McCaffery & Ferrell, 1997b). Further research into nursing students' attitudes regarding pain, curricular issues related to presentation of pain content in nursing

education, and the appropriateness of available resources will enhance student learning and better prepare nursing students – the future professionals – for clinical practice. The ultimate outcome will be improved patient care related to pain. A goal of nursing research should be pain management practices that overcome the problem of pain undertreatment. The following research is proposed:

1. Examine the attitudes of entry-level nursing students regarding pain and pain management.
2. Analyze nursing students' attitudes regarding pain and pain management over time as they progress through the nursing program.
3. Compare attitudes of nursing students and staff nurses in a Designated Education Unit.
4. Examine the pain related attitudes of nursing faculty who teach pain content in nursing programs.
5. Investigate the pain content in nursing curricula.
6. Examine the pain content in textbooks commonly used in nursing courses.

Conclusion

This research adds to the body of knowledge about attitudes regarding pain and pain management. Participants in the study were baccalaureate nursing students from two universities. Findings from this study supported those of Jurgens (1996) and Edwards et al. (2001) who examined registered nurses' attitudes and intentions toward administering opioid analgesics. In addition, Ajzen's (1992) TPB was used to predict intentions of the student participants to administer opioid analgesics. Results showed

that direct attitudes and perceptions of control were highly predictive of intention and supported Ajzen's theory.

In general, attitudes about pain and administration of opioid analgesics were positive among the study participants, but misconceptions were also noted. Findings supported the premise that entry-level nursing students have similar attitudes as the public. Education is needed to dispel misconceptions and provide the necessary information to guide clinical practice and improve patient outcomes.

This research was a first step to identify what pain related content nursing students need in their curricula and what attitudes about pain exist when students enter a nursing program. However, learning in the classroom needs to be transferred to the clinical setting. Socialization into the profession of nursing includes both theory and practice. Changes in students' views during their education may have an important influence on the care of patients they encounter who are experiencing pain.

References

Agan, D. L. (2001). The role of education in the treatment of chronic pain patients: A quantitative study of factors that influence the self-management of chronic pain. *Dissertation Abstracts International, 62/03,* 927. (UMI No. 3007286)

Agency for Health Care Policy and Research. (1992a). *Clinical practice guideline. Acute pain management: Operative or medical procedures and trauma.* (AHCPR Publication Number 92-0032). Rockville, MD: Agency for Healthcare Policy and Research, Public Health Service, U.S. Department of Health and Human Services.

Agency for Health Care Policy and Research. (1992b). *Quick reference guide for clinicians. Pain management in adults: Operative procedures.* (AHCPR Publication Number 92-0019). Rockville, MD: Agency for Healthcare Policy and Research, Public Health Service, U.S. Department of Health and Human Services.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50,* 179-211.

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology, 52,* 27-58.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall.

Allare, P., Maunsell, E., Labbe, J., & Dorval, M. (2001). Educational interventions to improve cancer pain control: A systematic review. *Journal of Palliative Medicine, 4,* 191-203.

Allock, N., & Toft, C. (2003). Student nurses' attitudes to pain relieving drugs. *International Journal of Nursing Studies, 40,* 125-131.

American Geriatrics Society Panel on Persistent Pain in Older Persons. (2002). The management of persistent pain in older persons. *Journal of the American Geriatrics Society, 50* (Suppl. 6), S205-S224.

American Nurses Association. (1995). *Nursing care report card for acute care.* Washington, D.C., Author.

American Pain Society. (1995). Pain: The fifth vital sign. Glenview, IL: Author. Retrieved July 30, 2000, from http://www.ampainsoc.org/advocacy/fifth/htm

Anderson, R. (2001). Race, ethnicity, gender, and age as dimensions of pain. *Dynamic Chiropractic, 19*(18), 27-31.

Anonymous. (2001). Pain relief guidelines target age-old problem—undertreatment of pain by doctors. *People's Medical Society Newsletter, 20*(6), 6-7.

Apfelbaum, J., Chen, C., Mehta, S., & Gan, T. (1997). Postoperative pain experience: Results from a national survey suggest postoperative pain continues to be undermanaged. *Anesthesia and Analgesia, 2,* 534-540.

Arnstein, P. (2002). Optimizing perioperative pain management. *AORN, 76,* 812-818.

Arthur, D. (2001). The effects of the problem-based alcohol early-intervention education package on the knowledge and attitudes of students of nursing. *Journal of Nursing Education, 40,* 63-72.

Ashford, J., Eccles, M., Bond, S., Hall, J. A., & Bond, J. (1999). Improving health care through professional behaviour change: Introducing a framework for identifying behaviour change strategies. *British Journal of Clinical Governance, 4,* 14-23.

Aubrun, F., Salvi, N., Coriat, P., & Riou, B. (2005). Sex- and age-related differences in morphine requirements for postoperative pain relief. *Anesthesiology, 103,* 156-160.

Balding, M., Garcia-Garrett, M., Reynolds, V. E., & Weiss, M. (2003). Nurses' knowledge of pain management in older adults. *Journal of the American Geriatrics Society, 51*(Suppl. 4), S133.

Bellinger, K., Romelfanger, M., Algren, C. L., & Hagan, P. C. (1998). The impact of nursing on pain management. In R. S. Weiner (Ed.), *Pain management: A practical guide for clinicians* (5th ed., pp. 325-336). Boca Raton, FL: St. Lucie Press.

Bergh, I., & Sjöström, B. (1999). A comparative study of nurses' and elderly patients' ratings of pain and pain tolerance. *Journal of Gerontological Nursing, 25*(5), 30-36.

Berkley, K. J. (1997). Sex differences in pain. *Behavioral and Brain Sciences, 20*, 371-380.

Bonham, V. L. (2001). Race, ethnicity, and pain treatment: Striving to understand the causes and solutions to the disparities in pain treatment. *Journal of Law, Medicine & Ethics, 29*(1), 52-68.

Bonica, J. J., & Loeser, J. D. (2001). History of pain concepts and therapies. In J. .D. Loeser's (Ed.), *Bonica's management of pain,* (3rd ed., pp. 3-16). Philadelphia: Lippincott.

Boughton, K., Blower, C., Chartrand, C., Dircks, P., Stone, T., Youwe, G., & Hagen, B. (1998). Impact of research on pediatric pain assessment and outcomes. *Pediatric Nursing, 24,* 31-35.

Briggs, C. (2004). Nursing students' assessment ratings and treatment choices for patients experiencing pain in a case vignette: Implications for nursing education. *Dissertation Abstracts International, 65/09*, 3621. (UMI No. 3148280).

Briggs, E. (2003). The nursing management of pain in older people. *Nursing Older People, 14*(7), 23-29.

Brockoff, D. (1998). State medical boards and pain management: Commentary. *Journal of Pain and Symptom Management, 15,* 381-382.

Brockopp, D., Brockopp, G., Warden, S., Wilson, J., Carpenter, J., & Vandeveer, B. (1998). Barriers to change: A pain management project. *International Journal of Nursing Studies, 35,* 226-232.

Brown, D. (2004). A literature review exploring how healthcare professionals contribute to the assessment and control of postoperative pain in older people. *Journal of Clinical Nursing, 13*(6b), 74-90.

Brown, S. T., Bowman, J. M., & Eason, F. R. (1999). Assessment of nurses' attitudes and knowledge regarding pain management. *Journal of Continuing Education in Nursing, 30,* 132-139.

Brownfield, E. (n.d.). *Pain management*. Retrieved November 18, 2003, from http://www.ahcpr.gov.clinic/ptsafety/chap37a.htm.

Brunier, G., Carson, G., & Harrison, D. E. (1995). What do nurses know and believe about patients with pain: Results of a hospital survey. *Journal of Pain and Symptom Management, 10,* 436-445.

Brunt, B. (2000). Continuing education evaluation of behavior change. *Journal for Nurses in Staff Development, 16,* 49-54.

Buchbinder, R., Jolley, E., & Wyatt, M. (2001). Population based intervention to change back pain beliefs and disability: Three part evaluation. *British Medical Journal, 322,* 1516-1520.

Bucknall, T., Manias, E., & Botti, M. (2001). Acute pain management: Implications of scientific evidence for nursing practice in the postoperative context. *International Journal of Nursing Practice, 7,* 266-273.

Bullock, S., & Manias, E. (2002). The educational preparation of undergraduate nursing students in pharmacology: A survey of lecturers' perceptions and experiences. *Journal of Advanced Nursing, 40,* 1-16.

Burns, N. & Grove, S. K. (2001). *The practice of nursing research* (4th ed.). Philadelphia: Saunders.

Carr, E. (1997). How to achieve effective pain management. *Nursing Times, 93*(37), 52-53.

Carr, E. J. (2002). Removing barriers to optimize the delivery of pain management: Editorial. *Journal of Clinical Nursing, 11,* 703-704.

Cason, C., Jones, T., Brock, J., Maese, P., & Milligan, C. (1999). Nurses' knowledge of pain management: Implications for staff education. *Journal for Nurses in Staff Development, 15,* 228-235.

Chiu, L. H., Trinca, J., Lim, L. M., & Tuazon, J. A. (2003). A study to evaluate the pain knowledge of two sub-populations of final year nursing students: Australia and Philippines. *Journal of Advanced Nursing, 41,* 99-108.

Chuk, P. (2002). Determining the accuracy of pain assessment of senior student nurses: A clinical vignette approach. *Nurse Education Today, 22,* 393-400.

Clarke, A. (1999). Changing attitudes through persuasive communication. *Nursing Standard, 13,* 45-47.

Clarke, E. B., French, B., Bilodeau, M. L., Capasso, B. C., Edwards, A., & Empoliti, J. (1996). Pain management knowledge, attitudes and clinical practice: The impact of nurses' characteristics and education. *Journal of Pain and Symptom Management, 11,* 18-31.

Cleeland, C. S., Cleeland, L. M., Reuvan, D., & Rinehardt, L. C. (1986). Factors influencing physicians' management of cancer pain. *Cancer, 58*, 796-800.

Closs, S. J. (1994). Pain in the elderly: A neglected phenomenon? *Journal of Advanced Nursing, 19,* 1072-1081.

Closs, S. J. (1996). Pain and elderly patients: A survey of nurses' knowledge and experiences. *Journal of Advanced Nursing, 23,* 237-242.

Cohen, F. L. (1980). Postsurgical pain relief: Patients' status and nurses' medication choices. *Pain, 9,* 265-274.

Costello, R. B., et al. (Eds.). (1994). *American Heritage Dictionary* (3rd ed., pp.54, 465). New York: Houghton Mifflin.

Coyne, M. L., Reinert, B., Cater, K., Dubuisson, W., Smith, J. F., Parker, M. M., & Chatham, C. (1999). Nurses' knowledge of pain assessment, pharmacologic and nonpharmacologic interventions. *Clinical Nursing Research, 8,* 153-165.

Cramer, G. W., Galer, B. S., Mendelson, M. A., & Thompson, G. D. (2000). A drug use evaluation of selected opioid and nonopioid analgesics in the nursing facility setting. *Journal of the American Geriatrics Society, 48,* 398-404.

Dahlman, G., Dykes, A., & Elander, G. (1999). Patients' evaluation of pain and nurses' management of the analgesics after surgery: The effect of a study day on the subject of pain for nurses working at the thorax surgery department. *Journal of Advanced Nursing, 30,* 866-874.

Dalton, J., Blau, W., Carlson, J., Mann, J. D., Bernard, S., Toomey, T., Pierce, S., & Germino, B. (1996). Changing the relationship among nurses' knowledge, self-reported behavior, and documented behavior in pain management: Does education make a difference? *Journal of Pain and Symptom Management, 12,* 308-319.

Dalton, J., Carlson, J., Mann, J. D., Blau, W., Bernard, S., & Youngblood, R. (1998). An examination of nursing attitudes and pain management practices. *Cancer Practice, 6,* 115-124.

Davidhizar, R., & Bartlett, D. (2000). Helping your patients control their pain. *ABNF Journal,11*(1), 13-17.

Davidhizar, R., & Farabaugh, N. (1994). Changing nursing students' attitudes. *Hospital Topics, 72*(3), 32-36.

Davitz, J. R., & Davitz, L. L. (1981). *Inferences of patients' pain and psychological distress.* New York: Springer.

de Rond, M., de Wit, R., & van Dam, F. (2001). The implementation of a pain monitoring programme for nurses in daily clinical practice: Results of a follow-up study in five hospitals. *Journal of Advanced Nursing, 35,* 590-598.

Desbiens, N. A., Mueller-Rizner, N., Connors, A., Hamel, M. B., & Wenger, N. S. (1997). Pain in the oldest-old during hospitalization and up to one year later. *Journal of the American Geriatrics Society, 45,* 1167-1172.

Desbiens, N., & Wu, W. (2000). Pain and suffering in seriously ill hospitalized patients. *Journal of the American Geriatrics Society, 43*(Suppl.), S183-S186..

Desbiens, N. A., Wu, A. W., Broste, S. K., Wenger, N. S., Connors, A. F. , Lynn, J., Yasui, Y., Phillips, R. S., & Fulkerson, W. (1996). Pain and satisfaction with pain control in seriously ill hospitalized patients: Findings from the SUPPORT research investigations. *Critical Care Medicine, 24,* 1953-1961.

Diocesan Health Facilities Pain Management Program. (n.d.) Pain management page. Retrieved on July 1, 2005, from www.dhfo.org/pain_management-page.htm

Dix, P. Sandhar, B., Murdoch, J., & MacIntyre, P. A. (2004). Pain on medical wards in a district general hospital. *British Journal of Anaesthesia, 92,* 235-237.

Donovan, M. I., & Dillon, P. (1987). Incidence and characteristics of pain in a sample of hospitalized cancer patients. *Cancer Nursing, 10*, 85-92.

Donovan, M. I., Dillon, P., & McGuire, L. (1987). Incidence and characteristics of pain in a sample of medical-surgical inpatients. *Pain, 30*, 69-78.

Dooks, P. (2001). Diffusion of pain management research into nursing practice. *Cancer Nursing, 24*(2), 99-103.

Dorrepaal, K. L., Aaronson, N. K., & Frits, S. A. (1989). Pain experience and pain management among hospitalized cancer patients. *Cancer, 63*, 593-598.

Drayer, R. A., Henderson, J., & Reidenberg, M. (1999). Barriers to better pain control in hospitalized patients. *Journal of Pain and Symptom Management, 17,* 434-440.

Driever, M. J. (2002). Are evidence-based practice and best practice the same? *Western Journal of Nursing Research, 24,* 591-597.

Ducharme, J. (2000). Acute pain and pain control: State of the art. *Annals of Emergency Medicine, 35,* 592-603.

Edwards, H. E., Nash, R. E., Najman, J. M., Yates, P. M., Fentiman, B. J., Dewar, A., et al. (2001). Determinants of nurses' intention to administer opioids for pain relief. *Nursing and Health Sciences, 3,* 149-159.

Engle, V. F., Graney, M. J., & Chan, A. (2001). *Journals of Gerontology, 56, M405-M411.*

Ely, B. (2001). Pediatric nurses' pain management practice: Barriers to change. *Pediatric Nursing, 27,* 473-480.

Erkes, E. B., Parker, V. G., Carr, R. L., & Mayo, R. M. (2001). An examination of critical care nurses' knowledge and attitudes regarding pain management in hospitalized patients. *Pain Management Nursing, 2,* 47-53.

Fazekas, A., Senn, C. Y., & Ledgerwood, D. M. (2001). Predictors of intention to use condoms among university women: An application and extension of the Theory of Planned Behavior. *Canadian Journal of Behavioural Science, 33,* 103-117.

Ferrell, B. A. (2000). Pain management. *Clinical Geriatric Medicine, 16,* 853-874.

Ferrell, B., Novy, D., Sullivan, M., Banja, J., Dubois, M., Gitlin, M., et al. (2001). Ethical dilemmas in pain management. *Journal of Pain, 2,* 171-180.

Ferrell, B. R., McGuire, D. B., & Donovan, M. I. (1993). Knowledge and beliefs regarding pain in a sample of nursing faculty. *Journal of Professional Nursing, 9*(2), 79-88.

Ferrell, B.R., Virani, R., Grant, M., Vallerand, A., & McCaffery, M. (2000). Analysis of pain content in nursing textbooks. *Journal of Pain and Symptom Management, 19,* 216-228.

Fillingim, R. H. (2000). Sex-related differences in the experience of pain. *American Pain Society Bulletin, 10*(1). Retrieved June 30, 2002, from http://www.ampainsoc.org/pub/bulletin/jan00/upda1.htm.

Fins, J. J. (1997). Public attitudes about pain and analgesics: Clinical implications. *Journal of Pain and Symptom Management, 13,* 169-161.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Fortner, B. V., Okon, T. A., Ashley, J., Kepler, G., Chavez, J., Tauer, K., Clements-Thompson, M., Schwartzberg, L., Demarco, G., & Houts, A. C. (2003). The Zero Acceptance of Pain (ZAP) quality improvement project: Evaluation of pain severity, pain interference, global quality of life, and pain-related costs. *Journal of Pain and Symptom Management, 25,* 334-343.

Fosnocht, D. E., Swanson, E. R., & Barton, E. D. (2005). Changing attitudes about pain and pain control in emergency medicine. *Emergency Medicine Clinics of North America, 23,* 297-306.

Fothergill-Bourbonnais, F., & Wilson-Barnett, J. (1992). A comparative study of intensive therapy unit and hospice nurses' knowledge on pain management. *Journal of Advanced Nursing, 17,* 362-372.

Francke, A. L., Garssen, B., & Abu-Saad, H. H. (1996). Continuing pain education in nursing: A literature review. *International Journal of Nursing Studies, 33,* 567-578.

Francke, L. Lemmens, A., Abu-Saad, H. H., & Grypdonck, M. (1997). Nurses' perceptions of factors influencing the use of a pain program. *Journal of Pain and Symptom Management, 14,* 300-310.

Frank-Stromborg, M., & Christensen, A. (2001). A serious look at the undertreatment of pain: Part II. *Clinical Journal of Oncology Nursing, 5,* 276-278.

Frankel, D. (1998). Pain management poorly taught in USA. *Lancet, 351,* 1334.

Friedman, D. P. (1990). Perspectives on the medical use of drugs of abuse. *Journal of Pain and Symptom Management, 5,* S2-S5.

Furrow, B. R. (2001). Pain management and provider liability: No more excuses. *Journal of Law, Medicine & Ethics, 29,* 28-51.

Furstenberg, C. T., Ahles, T. A., Whedon, M. B., Pierce, K. L., Dolan, M., Roberts, L., & Silberfarb, P. M. (1998). Knowledge and attitudes of health-care providers toward cancer pain management: A comparison of physicians, nurses, and pharmacists in the State of New Hampshire. *Journal of Pain and Symptom Management, 15,* 335-349.

Gantt, C. (2001). The theory of planned behavior and postpartum smoking relapse. *Journal of Nursing Scholarship, 33,* 337-341.

Gloth III, F. M. (2000). Geriatric pain: Factors that limit pain relief and increase complications. *Geriatrics, 55,* 46-54.

Godin, G., Valois, P, Lepage, L., & Desharnais, R. (1992). Predictors of smoking behaviour: An application of Ajzen's theory of planned behaviour. *British Journal of Addiction, 87,* 1335-1343.

Goldfrank, L. R., & Knopp, R. K. (2000). Racially and ethnically selective oligoanalgesia: Is this racism? *Annals of Emergency Medicine, 35,* 79-81.

Good, M. (1999). Acute pain. *Annual Review of Nursing Research, 17,* 107-132.

Graffam, S. (1990). Pain content in the curriculum—a survey. *Nurse Educator, 15*(1), 20-23.

Green, C. R., & Tait, A. R. (2002). Attitudes of healthcare professionals regarding different modalities used to manage acute postoperative pain. *Acute Pain, 4,* 15-21.

Green, S. B., & Salkind, N. J. (2005). *Using SPSS: Analyzing and understanding data* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Greenberger, P. (2001). Women, men, and pain. *Journal of Women's Health & Gender-Based Medicine, 10,* 309-310.

Grosse, G., Soares, J. F., & Lundberg, U. (2000). Gender differences in coping with musculoskeletal pain. *International Journal of Behavioral Medicine, 7,* 305-321.

Hamers, J. P., van den Hout, M. A., Halfens, R. J., Abu-Saad, H. H., & Heijltjes, A. E. (1997). Differences in pain assessment and decisions regarding the administration of analgesics between novices, intermediates and experts in pediatric nursing. *International Journal of Nursing Studies, 34,* 325-334.

Hanson, M. J. (1997). The theory of planned behavior applied to cigarette smoking in African-American, Puerto Rican, and non-Hispanic white teenage females. *Nursing Research, 46,* 155-162.

Hardcastle, V. G. (1999). *The myth of pain.* Cambridge, MA: MIT Press.

Harris & Associates, Inc. (1999). National pain survey: A national opinion survey. Conducted by Louis Harris & Associates, Inc., for Ortho-McNeil Pharmaceutical, Inc. Retrieved September 29, 2003, from www.ultram.com/painsurvey/mfindings.htm.

Harris & Associates, Inc. (2001). The attitudes and beliefs about over-the-counter medicines: A national opinion survey. Conducted by Louis Harris & Associates, Inc., for the National Council on Patient Information and Education. Retrieved June 17, 2004, from www.bemedwise.org.

Hart Research Associates. (2003). Americans talk about pain: A survey among adults nationwide. Retrieved July 1, 2005, from www.researchamerica.org/polldata/2003/painpoll03.pdf

Hausenblas, H. A., Carron, A. V., & Mack, D. E. (1997). Application of the Theories of Reasoned Action and Planned Behavior to exercise behavior: A meta-analysis. *Journal of Sport and Exercise Psychology, 19,* 36-51.

Heilman, S. C., & Witztum, E. (2000). All in faith: Religion as the idiom and means of coping with distress. *Mental Health, Religion & Culture, 3,* 115-124.

Heye, M. L., & Goddard, L. (1999). Teaching pain management: How to make it work. *Journal for Nurses in Staff Development, 15,* 27-36.

Hicks, C., & Hennessy, D. (1997). Mixed messages in nursing research: Their contribution to the persisting hiatus between evidence and practice. *Journal of Advanced Nursing, 25,* 595-601.

Hoffmann, D. E., & Tarzian, A. J. (2001). The girl who cried pain: A bias against women in the treatment of pain. *Journal of Law, Medicine & Ethics, 29,* 13-27.

Horbury, C., Henderson, A., & Bromley, B. (2005). Influences of patient behavior on clinical nurses' pain assessment: Implications for continuing education. *Journal of Continuing Education in Nursing, 36*(1), 18-25.

Howell, D., Butler, L., Vincent, L., Watt-Watson, J., & Stearns, N. (2000). Influencing nurses' knowledge, attitudes, and practice in cancer pain management. *Cancer Nursing, 23*, 55-63.

Huck, S. W. (2000). *Reading statistics and research* (3rd ed.). New York: Longman.

Hudson-Barr, D. C., Duffey, M. A., Holditch-Davis, D., Funk, S., & Frauman, A. (1998). Pediatric nurses' use of behaviors to make medication administration decisions in infants recovering from surgery. *Research in Nursing & Health, 21,* 3-13.

Hunt, K. (1995). Perceptions of patients' pain: A study assessing nurses' attitudes. *Nursing Standard, 10*(4), 32-35.

International Association for the Study of Pain (1979). Pain terms: A list with definitions and notes on usage, *Pain, 6,* 249.

International Association for the Study of Pain. (1993). Pain control: The new "whys" and "hows." Seattle, WA: Author. Retrieved July 1, 2005, from www.iasp-pain.org/PCU93a.html

International Association for the Study of Pain. (1994). IASP pain terminology. Retrieved July 21, 2001, from www.iasp_pain.org/terms-p.html

International Association for the Study of Pain. (2000). Outline curriculum on pain for schools of nursing. Seattle, WA: Author. Retrieved July 17, 2000, from http://www.halcyon.com/www3/iasp/nursing_toc.html.

Jackson, R., Iezzi, T., Gunderson, J., Nagasaka, T., & Fritch, A. (2002). Gender differences in pain perception: The mediating role of self-efficacy beliefs. *Sex Roles: A Journal of Research.* Retrieved November 24, 2003, from http://findarticles.com/cf_0/m2294/2002_Dec/98125312/print.jhtml.

Jacob, E., & Puntillo, K. A. (1999). A survey of nursing practice in the assessment and management of pain in children. *Pediatric Nursing, 25,* 278-286.

Jacox, A. K. (1979). Assessing pain. *American Journal of Nursing, 79,* 895-900.

Johnston, C. C., Gagnon, A. J., Fullerton, L., Common, C., Ladores, M., & Forlini, S. (1998). One-week survey of pain intensity on admission to and discharge from the emergency department: A pilot study. *Journal of Emergency Medicine, 16,* 377-382.

Johnston, M. S. (1999). Are we effectively managing acute pain in the ED trauma patient? *Journal of Emergency Nursing, 25,* 163-164.

Joint Commission on Accreditation for Healthcare Organizations (JCAHO). (1999). Patient rights and organization ethics. *Comprehensive accreditation manual for hospitals: The official handbook.* Oakbrook Terrace, IL: Author. Retrieved June 23, 2000, from http://www.jcaho.org/standard/pm_hap.html.

Jordan, S., Coleman, M., Hardy, B., & Hughes, D. (1999). Assessing educational effectiveness: The impact of a specialist course on the delivery of care. *Journal of Advanced Nursing, 30,* 796-807.

Jurgens, D. W. (1996). Nurses' intentions to administer morphine for post-operative pain: An application of Ajzen's Theory of Planned Behavior. (Doctoral dissertation) *Dissertation Abstracts International, 58,* 12B. (UMI No. NQ24026)

Keefe, F. J., Lumley, M. A., Buffington, A. L., Carson, J. W., Studts, J. L., Edwards, C. L., et al. (2002). Changing face of pain: Evolution of pain research in psychosomatic medicine. *Psychosomatic Medicine, 64,* 921-938.

Knoblauch, S. C., & Wilson, C. J. (1999). Clinical outcomes of educating nurses about pediatric pain management. *Outcomes Management for Nursing Practice, 3*, 87-89,

Kovach, C. R., Griffie, J., Muchka, S., Noonan, P., & Weissman, D. E. (2000). Nurses' perceptions of pain assessment and treatment in the cognitively impaired elderly: It's not a guessing game. *Clinical Nurse Specialist, 14,* 215-220.

Lammers, J., & Fox, E. (1991). Predicting breast self-examination using Fishbein's Theory of Reasoned Action. *Wellness Perspectives, 7*(2), 3-12.

Lasch, K. E. (2000). Culture, pain, and culturally sensitive pain care. *Pain Management Nursing, 1*(3), 16-22.

Lasch, K., Greenhill, A., Wilkes, G., Carr, D., Lee, M., & Blanchard, R. (2002). Why Study pain? A qualitative analysis of medical and nursing faculty and students' knowledge of and attitudes to cancer pain management. *Journal of Palliative Medicine, 5*, 57-71.

Lebovits, A. H., Florence, I., Bathina, R., Munko, V., Fox, M. T., & Bramble, C. Y. (1997). Pain knowledge and attitudes of healthcare providers: Practice characteristic differences. *Clinical Journal of Pain, 13,* 237-243.

Lee, A., Gin, T., & Oh, T. E. (1997). Opioid requirements and responses in Asians. *Anaesthesia & Intensive Care, 25,* 665-670.

Leveille, S., Zhang, Y., McMullen, W., Kelly-Hayes, M., & Felson, D. (2005). Sex differences in musculoskeletal pain in older adults. *Pain, 116,* 332-338.

Lewis, S. M., Heitkemper, M. M., & Dirksen, S. R. (2004). *Medical-surgical nursing: Assessment and management of clinical problems.* St. Louis: Mosby.

Lewis, L. M., Lasater, L. C., & Brooks, C. B. (1994). Are emergency physicians too stingy with analgesics? *Southern Medical Journal, 87*(1), 7-9.

Lindberg, J. B., Hunter, M. L., & Kruszewski, A. Z. (1994). *Introduction to nursing: Concepts, issues, and opportunities* (pp. 247-297). Philadelphia: Lippincott.

Ludwig-Beymer, P. (2003). Transcultural aspects of pain. In M. M. Andrews & J. C. Boyle (Eds.) *Transcultural concepts in nursing care* (4th ed., pp. 405-431). Philadelphia: Lippincott.

Manias, E. (2003). Pain and anxiety management in the postoperative gastro-surgical setting. *Journal of Advanced Nursing, 41,* 585-594.

Manias, E., Botti, M., & Bucknall, T. (2002). Observation of pain assessment and management: The complexities of clinical practice. *Journal of Clinical Nursing, 11,* 724-733.

Manworren, R. (2001). Development and testing of the Pediatric Nurses' Knowledge and Attitudes Survey regarding pain. *Pediatric Nursing, 27,* 151-158.

Margolius, F. R., Hudson, K. A., & Michel, Y. (1995). Beliefs and perceptions about children in pain: A survey. *Pediatric Nursing, 21,* 111-115.

Marks, R. M., & Sachar, E. J. (1973). Undertreatment of medical inpatients with narcotic analgesics. *Annals of Internal Medicine, 78*, 173-181.

Martin, M. L. (2000). Ethnicity and analgesic practice: An editorial. *Annals of Emergency Medicine, 35,* 77-79.

Martino, A. M. (1998). In search of a new ethic for treating patients with chronic pain: What can medical boards do? *Journal of Law, Medicine & Ethics, 26,* 332, 336.

Maxam-Moore, V. A., Wilkie, D. J., & Woods, S. L. (1994). Analgesics for cardiac surgery patients in critical care: Describing current practice. *American Journal of Critical Care, 3*(1), 31-39.

McCaffery, M. (1972). *Nursing management of the patient with pain.* Philadelphia: Lippincott.

McCaffery M., & Ferrell, B. R. (1992). Does the gender gap affect your pain control decisions? *Nursing, 22*(8), 48-51.

McCaffery, M., & Ferrell, B. R. (1996). Correcting misconceptions about pain assessment and use of opioid analgesics: Educational strategies aimed at public concerns. *Nursing Outlook, 44,* 184-190.

McCaffery, M., & Ferrell, B. R. (1997a). Influence of professional vs. personal role on pain assessment and use of opioids. *Journal of Continuing Education in Nursing, 28*(2), 69-77.

McCaffery, M., & Ferrell, B. R. (1997b). Nurses' knowledge of pain assessment and management: How much progress have we made? *Journal of Pain and Symptom Management, 14,* 175-188.

McCaffery, M., & Ferrell, B. R. (1997c). Open letter to colleagues about the Nurses Knowledge and Attitudes Survey regarding pain. Retrieved June 12, 2001, from http://www.prc.coh.org/Instruments/vignettes.htm.

McCaffery, M., Ferrell, B. R., & Pasero, C. (2000). Nurses' personal opinions about patients' pain and their effect on recorded assessments and titration of opioid doses. *Pain Management Nursing, 1*(3), 79-87.

McCaffery, M., & Pasero, C. (1999). *Pain: Clinical manual* (2nd ed.). St. Louis: Mosby.

McCloskey, J. C., & Bulechek, G. M. (1996). *Nursing interventions classification (NIC),* (2nd ed). St. Louis: Mosby.

McGuire, L. (1994). The nurse's role in pain relief. *MEDSURG Nursing, 3,* 94-98.

Melzack, R., Abbott, F. V., Zackon, W., Mulder, D. S., & Davis, M. (1987). Pain on the surgical ward: A survey of the duration and intensity of pain and the effectiveness of medication. *Pain, 29,* 67-72.

Mrozek, J. E., & Werner, J. S. (2001). Nurses' attitudes toward pain, pain assessment, and pain management practices in long-term care facilities. *Pain Management Nursing, 2,* 154-162.

Munro, B. H. (Ed.). (2001). *Statistical methods for health care research* (4th ed.). Philadelphia: Lippincott.

National Consumers League. (2003). Over-the-counter pain medication study. A national opinion survey conducted by Louis Harris & Associates, Inc., for National

Consumers League. Retrieved June 28, 2005, from www.nclnet.org/otcpain/NCL%20pres1.ppt

Nayak, S., Shiflett, S. C., Eshun, S., & Levine, F. M. (2000). Culture and gender effects in pain beliefs and the prediction of pain tolerance. *Cross-Cultural Research, 34,* 135-151.

Nieswaidomy, R. M. (2002). *Foundations of nursing research* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Ng, B., Dimsdale, J. E., Shragg, G. P., & Deutsch, R. (1996). Ethnic differences in analgesic consumption for postoperative pain. *Psychosomatic Medicine, 58,* 125-129.

O'Brien, S., Dalton, J., Konsler, G., & Carlson, J. (1996). The knowledge and attitudes of experienced oncology nurses regarding the management of cancer-related pain. *Oncology Nursing Forum, 23,* 515-521.

Owens, K. (2000). Effects of nursing education on students' pain management knowledge. *Nurse Educator, 25*(1), 33, 37.

Partners against Pain. (2001). *A survey of pain in America.* Retrieved July 13, 2003, from www.partnersagainstpain.com/html/survey/surv_5.htm

Pasero, C. (2003). Pain in the emergency department: Withholding pain medication is not justified. *American Journal of Nursing, 103*(7), 73-74.

Polit, D. R., & Hungler, B. P. (1993). *Essentials of nursing research, methods, appraisal, and utilization* (3rd ed.). Philadelphia: Lippincott.

Petrack, E. M., Christopher, N. C., & Kriwinsky, J. (1997). Pain management in the emergency department: Patterns of analgesic utilization. *Pediatrics, 99,* 711-174.

Pud, D. (2004). Personal past experience with opioid consumption affects attitudes and knowledge related to pain management. *Pain Management Nursing, 5*, 153-159.

Resnik, D. B., Rehm, M., & Minard, R. B. (2001). The undertreatment of pain: Scientific, clinical, cultural, and philosophical factors. *Medicine, Health Care and Philosophy, 4,* 277-288.

Retsas, A. (2000). Barriers to using research evidence in nursing practice. *Journal of Advanced Nursing, 31,* 599-606.

Rey, R. (1995). *The history of pain.* Cambridge, MA: Harvard University Press.

Rippentrop, E., Altmaier, E. M., Chen, J. J., Found, E. M., & Keffala, V. J. (2005). The relationship between religion/spirituality and physical health, mental health, and pain in a chronic pain population. *Pain, 116,* 311-321.

Roper Public Affairs & Media. (2004). Americans living with pain survey: Executive summary of results. Conducted by Roper Public Affairs & Media for the American Chronic Pain Association.

Rupp, T., & Delaney, K. (2004). Inadequate Analgesia in emergency medicine. *Annals of Emergency Medicine, 43,* 494-503.

Schaffler, R. L. (1993). Emergency nurses' decision-making and pain. *Masters Abstracts International, 31*(04), p. 1752. (UMI No. 1352414)

Schafheutle, E. I., Cantrill, J. A., & Noyce, P. R. (2001). Why is pain management suboptimal on surgical wards? *Journal of Advanced Nursing, 33,* 728-737.

Scherer, P. (2002). The problem of (managed) pain: Editorial. *Neurology and Neurosurgery, 4(2).* Retrieved November 29, 2002, from www.medscape.com.viewarticle/44015

Schlub, S. M., & Martsolf, D. S. (1999). Orthodox Christian beliefs and homophobia in baccalaureate nursing students. *Nursing Forum, 34*(2), 15-22.

Sheffield, D., Biles, P. L., Orom, H., Maixner, W., & Sheps, D. S. (2000). Race and sex differences in cutaneous pain perception. *Psychosomatic Medicine, 62,* 517-523.

Sherwood, G., Adams-McNeill, J., Starck, P., Nieto, B., & Thompson, C. (2000). Qualitative assessment of hospitalized patients' satisfaction with pain management. *Research in Nursing and Health, 23,* 486-495.

Sherwood, G., McNeill, J. Starck, P., & Disnard, G. (2003). Changing acute pain management outcomes in surgical patients. *AORN, 77,* 374, 377-380, 384, 386-388, 393-395.

Sloman, R., Ahern, M., Wright, A., & Brown, L. (2001). Nurses' knowledge of pain in the elderly. *Journal of Pain and Symptom Management, 21,* 317-322.

Smith-Stoner, M. (2003). How Buddhism influences pain control choices. *Nursing, 4,*17.

SPSS, Inc. (2002). *SPSS 11.5 Brief Guide.* Chicago: Author.

Staake, C. K. (1998). Descriptions of the knowledge and beliefs about pain, pain management, and pain content in curricula of Illinois nursing faculty and last semester A.D.N. and B.S.N. students. *Master's Abstracts International, 36/6,* 1592, (UMI No. 1390201).

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (3rd ed.). Boston: Allyn & Bacon.

Tanabe, P., & Buschmann, M. (1999). A prospective study of ED pain management practices and the patient's perspective. *Journal of Emergency Nursing, 25,* 171-177.

Tapp, J., & Kropp, D. (2005). Evaluation pain management delivered by direct care nurses. *Journal of Nursing Care Quality, 20,* 167-173.

Tcherney-Lessenot, S., Karwowski-Soulié, F., Lamarche-Vadel, A., Ginsburg, C., Brunet, F., & Vidal-Trecan, G. (2003). Management and relief of pain in an emergency department from the adult patients' perspective. *Journal of Pain and Symptom Management, 25,* 539-546.

Todd, K. H., Deaton, C., D'Adamo, A. P., & Goe, L. (2000). Ethnicity and analgesic practice. *Annals of Emergency Medicine, 35,* 11-16.

Todd, K. H., Samaroo, N., & Hoffman, J. R. (1993). Ethnicity as a risk factor for inadequate emergency department analgesia. *Journal of the American Medical Association, 271,* 1537-1539.

Trafimow, D., & Trafimow, J. H. (1998). Predicting back pain sufferers' intentions to exercise. *Journal of Psychology, 123,* 581-593.

Turk, D. C., & Okifuji, A. (2001). Pain terms and taxonomies of pain. In J. D. Loeser's (Ed.) *Bonica's management of pain* (3rd ed., pp. 17-22). Philadelphia: Lippincott.

Twycross, A. (2002). Educating nurses about pain management: The way forward. *Journal of Clinical Nursing, 11,* 705-714.

Vallerand, A. H. (1995). Gender differences in pain. *Journal of Nursing Scholarship, 27,* 235-237.

Villarruel, A. M., Bishop, T. L., Simpson, E. M., Jemmott, L. S., & Fawcett, J. (2001). Borrowed theories, shared theories, and the advancement of nursing knowledge. *Nursing Science Quarterly, 14,* 158-163.

Vincent, C. V., & Denyes, M. J. (2004). Relieving children's pain: Nurses abilities and analgesic administration practices. *Journal of Pediatric Nursing, 19*(1), 40-50.

Vourakis, C. (1998). Substance abuse concerns in the treatment of pain. *Nursing Clinics of North America, 33*(1), 47-60.

Watt-Watson, J. H. (1992). Misbeliefs about pain. In J. H. Watt-Watson & M. I. Donovan (Eds.), *Pain management: Nursing perspective* (pp. 36-58). St. Louis, MO: Mosby.

Weavers, S. (2000). *Pain management: Patient education manual.* Gaithersburg, MD: Aspen.

Weiss, G. (2002). Graduating nursing students' knowledge and attitudes about pain management. *Dissertation Abstracts International, 41/02*, 528. (UMI No. 1410858).

Werner, P., & Mendelsson, G. (2001). Nursing staff members' intentions to use physical restraints with older people: Testing the theory of reasoned action. *Journal of Advanced Nursing, 35,* 784-791.

Wessman, A. C., & McDonald, D. D. (1999). Nurses' personal pain experiences and their pain management knowledge. *Journal of Continuing Education in Nursing, 30,* 152-157.

Whelan, C. T., Jin, L., & Meltzer, D. (2004). Pain and satisfaction with pain control in hospitalized medical patients: No such thing as low risk. *Archives of Internal Medicine, 164,* 175-180.

Wilson, J. E., & Pendleton, J. M. (1989). Oligoanalgesia in the emergency department. *American Journal of Emergency Medicine, 7,* 620-623.

Wright, R. K., & Bell, S. K. (2001). Nurses' retention of pain management knowledge. *Journal for Nurses in Staff Development, 17,* 309-313.

Yates, P. A., Dewar, A., Edwards, H., Fentiman, B., Najman, J., Nash, R., Richardson, V., & Fraser, J. (1998). The prevalence and perception of pain amongst hospital in-patients. *Journal of Clinical Nursing, 7,* 521-530.

Zalon, M. L.(1995). Pain management instruction in nursing curricula. *Journal of Nursing Education, 34,* 262-267.

Zborowski, M. (1952). Cultural components in response to pain. *Journal of Social Issues,8,* 16-30.

Zeichner, A., Loftin, M., Panopoulos, G., Widner, S., & Allen, J. (2000). Sex differences in pain indices, exercise, and use of analgesics. *Psychological Reports, 86,* 129-133.

Zimmerman, P. G. (2004). Tips for managing pain more effectively. *Journal of Emergency Nursing, 30,* 470-472.

Appendix A

DEMOGRAPHIC INFORMATION

Thank you for agreeing to participate in this survey. All participants will remain anonymous and information received will be kept strictly confidential.

SECTION 1: ABOUT YOU

1. What is your gender?
   1 Male
   2 Female

2. What was your age at your last birthday?
   _____ years

3. What is your marital status?
   1 Single (Never married)
   2 Married
   3 Divorced/Separated
   4 Widowed

4. What is your work status? (Please provide as much detail as you can,
   _____
   (e.g., unemployed, student, homemaker, fast food service, restaurant wait staff, clerical, retail, etc.)

5. What is your highest earned degree?
   1 High school diploma
   2 Associate degree
   3 Bachelor's degree
   4 Master's degree
   5 Other (specify) _____

6. What is your ethnic/cultural background?
   1 Caucasian
   2 African American
   3 Hispanic
   4 Asian
   5 Pacific Islander
   6 Native American
   7 Other (specify)

   _____

7. What is your primary religious preference?
   1 Protestant
   2 Roman Catholic
   3 Jewish
   4 Islam
   5 Buddhist
   6 Shinto
   7 Hindu
   8 Other (specify) _____
   9 None

Appendix B

PAIN SURVEY

SECTION 2: OPINIONS ABOUT PAIN

The following items ask your opinions about pain. How much do you agree with each statement? There are no right or wrong answers— the investigator is only interested in what you personally believe about pain. Please circle one number for each statement.

	Strongly Disagree			No Opinion			Strongly Agree
1. Pain is the result of damage to the tissues of the body	1	2	3	4	5	6	7
2. It is impossible to do much for oneself to relieve pain	1	2	3	4	5	6	7
3. Experiencing pain is a sign that something is wrong with the body	1	2	3	4	5	6	7
4. There is little that can be done to ease the pain you feel	1	2	3	4	5	6	7
5. The amount of pain is related to the amount of damage	1	2	3	4	5	6	7
6. It is impossible to control pain on your own	1	2	3	4	5	6	7
7. Pain is a sign of illness	1	2	3	4	5	6	7
8. Concentration or relaxation can "take the edge off" pain	1	2	3	4	5	6	7
9. Being in pain prevents you from enjoying hobbies and social activities	1	2	3	4	5	6	7
10. Physical exercise makes pain worse	1	2	3	4	5	6	7
11. Pain can be controlled by changing your thoughts	1	2	3	4	5	6	7
12. It is possible to learn to manage pain	1	2	3	4	5	6	7
13. Feeling depressed makes pain seem worse	1	2	3	4	5	6	7
14. Being anxious makes pain worse	1	2	3	4	5	6	7
15. When relaxed, pain is easier to cope with	1	2	3	4	5	6	7
16. Thinking about pain makes it worse	1	2	3	4	5	6	7
17. It is possible to influence the amount of pain you feel	1	2	3	4	5	6	7
18. Being free from pain is important	1	2	3	4	5	6	7

SECTION 3: OPINIONS ABOUT PAIN RELIEF

The following items ask your opinions about pain relief. How much do you agree with each statement? Again, there are no right or wrong answers—the investigator is only interested in what you personally believe about pain relief. Please circle one number for each statement.

	Strongly Disagree			No Opinion			Strongly Agree
19. It's a good idea not to have pain relieving medication until you really need it	1	2	3	4	5	6	7
20. I usually tell someone if I am in pain	1	2	3	4	5	6	7
21. There is a real danger of becoming addicted to pain relieving medication	1	2	3	4	5	6	7
22. I do not like having injections	1	2	3	4	5	6	7
23. People can easily get addicted to pain relieving medication	1	2	3	4	5	6	7

	Strongly Disagree			No Opinion			Strongly Agree
24. It is important to be strong by not talking about pain	1	2	3	4	5	6	7
25. If you take pain relieving medication when you have some pain, then it might not wok as well if the pain becomes worse	1	2	3	4	5	6	7
26. I am afraid of injections	1	2	3	4	5	6	7
27. Nurses might find it annoying to be told about pain	1	2	3	4	5	6	7
28. Pain relieving medication should be "saved" in case the pain gets worse	1	2	3	4	5	6	7
29. I can't put up with pain at all	1	2	3	4	5	6	7
30. Pain relieving medication is very addictive	1	2	3	4	5	6	7
31. Doctors might find it annoying to be told about pain	1	2	3	4	5	6	7
32. Having an injection is painful	1	2	3	4	5	6	7
33. I can take a lot of pain	1	2	3	4	5	6	7
34. Normally I do not take pain relieving medication	1	2	3	4	5	6	7
35. Only weak people complain about pain	1	2	3	4	5	6	7
36. I would ask for pain relieving medication when I needed it	1	2	3	4	5	6	7
37. I would wait until the nurse asked me if I wanted pain relieving medication	1	2	3	4	5	6	7
38. I would be afraid to ask for pain relieving medication	1	2	3	4	5	6	7
39. I would wait until my pain was really bad before I asked for help	1	2	3	4	5	6	7
40. If the pain relieving medication didn't work, I would tell the nurse	1	2	3	4	5	6	7
41. I would ask for pain relieving medication before pain started	1	2	3	4	5	6	7
42. I would leave it up to my doctor to decide about my pain relieving medication	1	2	3	4	5	6	7
43. I would leave it up to the nurse to decide about my pain relieving medication	1	2	3	4	5	6	7
44. If the pain relieving medication didn't work, I would tell the doctor	1	2	3	4	5	6	7
45. I wouldn't like to bother the nurse if I had pain	1	2	3	4	5	6	7
46. I would rather have the pain than any of the side effects from pain relieving medication	1	2	3	4	5	6	7
47. I would prefer to be involved in deciding about my pain relieving medication	1	2	3	4	5	6	7
48. In general, how much relief do you believe that pain relieving medications should give?				Please circle one number			
No relief				0			
Little relief				1			
Moderate relief				2			
A lot of relief				3			
Complete relief				4			

49. In general, how concerned would you be about the possible side effects of pain relieving medication that are listed below:	Not at all Concerned						Extremely Concerned
Nausea	1	2	3	4	5	6	7
Vomiting	1	2	3	4	5	6	7
Drowsiness	1	2	3	4	5	6	7
Itch	1	2	3	4	5	6	7
Constipation	1	2	3	4	5	6	7
Drug addiction	1	2	3	4	5	6	7

	Nothing At All						A Great Deal
50. How much do you know about pain relieving medications?	1	2	3	4	5	6	7

51. What sorts of things would you like to know about pain relieving medications?

52. Throughout our lives, most of us have had pain from time to time (such as minor headaches, muscle aches, and toothaches). Please choose the one word that best describes your typical pain.

	Circle one number
Mild	1
Discomforting	2
Distressing	3
Horrible	4
Excruciating	5

52. Please circle the one number that best describes a previous pain episode at its worst.

0	1	2	3	4	5	6	7	8	9	10
No pain										Pain as bad as you can imagine

53. Please circle the one number that best describes your pain on the average.

0	1	2	3	4	5	6	7	8	9	10
No pain										Pain as bad as you can imagine

54. How much does your pain affect your ability to:	Not at all						Extremely
Sleep	1	2	3	4	5	6	7
Move	1	2	3	4	5	6	7
Eat	1	2	3	4	5	6	7
Work	1	2	3	4	5	6	7

55. How much does your pain make you feel:	Not at all						Extremely
Angry	1	2	3	4	5	6	7
Alone	1	2	3	4	5	6	7
Frightened	1	2	3	4	5	6	7
Exhausted	1	2	3	4	5	6	7
Depressed	1	2	3	4	5	6	7

56. How much relief do pain relieving medications give you?

Not applicable—do not ever take pain relieving medications	0
No relief	1
Some relief	2
A lot of relief	3
Complete relief	4

Appendix C

PAIN MANAGEMENT SURVEY

Please indicate your responses to the following statements by circling the one number which best describes your opinion. There are no right or wrong answers—the investigator is only interested in your general opinions.

SECTION 1: PAIN	Strongly Disagree			No Opinion			Strongly Agree
1. What a patient says about his/her pain is true	1	2	3	4	5	6	7
2. Patients' pain can be reliably assessed by their behavior	1	2	3	4	5	6	7
3. Age is a factor that influences the amount of pain that a patient will experience	1	2	3	4	5	6	7
4. Patients can sleep in spite of having pain	1	2	3	4	5	6	7
5. Patients' pain can be reliably assessed by physiological signs	1	2	3	4	5	6	7
6. Patients should expect to suffer some pain	1	2	3	4	5	6	7
7. Pain is whatever the patient says it is	1	2	3	4	5	6	7
8. Patients' pain can be determined from their medical/surgical condition	1	2	3	4	5	6	7
9. Patients have a right to expect total pain relief as a goal of treatment	1	2	3	4	5	6	7
10. The amount of pain patients experience is influenced by their gender	1	2	3	4	5	6	7
11. Estimation of pain by a registered nurse is a more valid measure of pain that patient self-report	1	2	3	4	5	6	7
12. Patients usually tell nursing staff if they are in pain	1	2	3	4	5	6	7
13. Patients don't like to bother nursing staff if they have pain	1	2	3	4	5	6	7
14. Patients can be maintained in a pain-free state	1	2	3	4	5	6	7
15. The amount of pain patients experience is influenced by their ethnic/cultural background	1	2	3	4	5	6	7

SECTION 2: NARCOTIC ANALGESIA	Strongly Disagree			No Opinion			Strongly Agree
16. Patients are usually reluctant to ask nursing staff for narcotic analgesia	1	2	3	4	5	6	7
17. Patients with a history of narcotic addiction should not be given narcotic analgesics for pain	1	2	3	4	5	6	7
18. Nurses cannot rely upon patients to ask for narcotic analgesia	1	2	3	4	5	6	7
19. Nurses can expect that patients will readily ask for narcotic analgesia	1	2	3	4	5	6	7
20. If a narcotic analgesic is ordered every 4 hours, nurses should instruct patients who report pain during that 4 hours to wait until their medication is due	1	2	3	4	5	6	7

	Strongly Disagree			No Opinion			Strongly Agree
21. Elderly patients generally require less narcotic analgesia than do adult patients	1	2	3	4	5	6	7
22. In general, children should not receive narcotic analgesia for pain relief	1	2	3	4	5	6	7
23. It is best to administer the least possible amount of narcotic analgesia	1	2	3	4	5	6	7
24. In general, elderly patient should not receive narcotic analgesia for pain relief	1	2	3	4	5	6	7
25. Narcotic analgesia should not be required for longer than 3 days post-operatively	1	2	3	4	5	6	7
26. It is usually best to start off administering **non-narcotic** analgesia when trying to relieve pain of any type	1	2	3	4	5	6	7
27. In general, patients should be encouraged to have non-narcotic rather than narcotic analgesia for pain	1	2	3	4	5	6	7
28. Addiction is likely to occur as a result of treating pain with narcotic analgesics	1	2	3	4	5	6	7

SECTION 3: ADMINISTRATION OF NARCOTIC ANALGESIA

We acknowledge that decisions about the administration of narcotic analgesia are often related to the specific patient situation. However, in this instance, we are interested in your general opinions.

	Extremely Unlikely			Unsure			Extremely Likely
29. How likely would you be to give a narcotic analgesic prescribed on a PRN (as needed) basis to a patient who has pain?	1	2	3	4	5	6	7
30. When you administer PRN narcotic analgesia, how likely is it that the following consequences will occur for the patient?							
Increased comfort	1	2	3	4	5	6	7
Increased independence	1	2	3	4	5	6	7
Increased mobility	1	2	3	4	5	6	7
Uncomfortable/unwanted side effects	1	2	3	4	5	6	7
Addiction to the medication	1	2	3	4	5	6	7
Inadequate pain relief	1	2	3	4	5	6	7
31. How likely are you to try to administer PRN narcotic analgesia when caring for a patient with pain?	1	2	3	4	5	6	7

32. In general, how likely is it that the following people would think that you should administer PRN narcotic analgesia to a patient with pain?	Extremely Unlikely			Unsure			Extremely Likely
The patient	1	2	3	4	5	6	7
The patient's family/friends	1	2	3	4	5	6	7
Your nursing colleagues	1	2	3	4	5	6	7
The medical staff	1	2	3	4	5	6	7
33. How desirable do you feel each of the following consequences would be for a patient who has received PRN narcotic analgesia?	Extremely Undesirable			No Opinion			Extremely Desirable
Increased comfort	1	2	3	4	5	6	7
Increased independence	1	2	3	4	5	6	7
Increased mobility	1	2	3	4	5	6	7
Addiction to the medication	1	2	3	4	5	6	7
Uncomfortable/unwanted side effects	1	2	3	4	5	6	7
Inadequate pain relief	1	2	3	4	5	6	7
34. In general, how likely are you to go along with the wishes of the following people?	Extremely Unlikely			No Opinion			Extremely Likely
The patient	1	2	3	4	5	6	7
The patient's friends/relatives	1	2	3	4	5	6	7
Your nursing colleagues	1	2	3	4	5	6	7
Medical staff	1	2	3	4	5	6	7
35. How much effect do each of the following factors have on whether you administer PRN narcotic analgesia to a patient with pain?	None At All			No Opinion			A Great Deal
Nursing unit expectations regarding the administration of narcotic analgesia	1	2	3	4	5	6	7
The route of administration	1	2	3	4	5	6	7
The type of pain the patient is experiencing	1	2	3	4	5	6	7
The patient's medical/surgical condition	1	2	3	4	5	6	7
The patient's characteristics (age, culture)	1	2	3	4	5	6	7
36. Please rate how much you agree with the following statements:	Strongly Disagree			No Opinion			Strongly Agree
I intend to administer PRN narcotic analgesia when caring for a patient with pain	1	2	3	4	5	6	7
Administering PRN narcotic analgesia to a patient with pain is within my control	1	2	3	4	5	6	7

37. How often would you consider each of the following factors prior to administering PRN narcotic analgesia to a patient with pain?	Not Very Often			No Opinion			Very Often
Nursing unit expectations regarding the administration of narcotic analgesia	1	2	3	4	5	6	7
The route of administration	1	2	3	4	5	6	7
The type of pain the patient is experiencing	1	2	3	4	5	6	7
The patient's medical/surgical condition	1	2	3	4	5	6	7
The patient's characteristics (e.g., age, culture, gender)	1	2	3	4	5	6	7
38. How easy would it be for you to administer PRN narcotic analgesia to a patient with pain?	Extremely Difficult 1	2	3	No Opinion 4	5	6	Extremely Easy 7
39. How much control do you believe you would have in administering PRN narcotic analgesia to a patient?	No Control At All 1	2	3	No Opinion 4	5	6	Complete Control 7

Thank you for participating in this research.

Appendix D

UNIVERSITY OF SAN DIEGO

Consent to Participate in a Nursing Research Study

Ruth L. Schaffler, a doctoral student at the University of San Diego, is conducting a research study to describe the knowledge and attitudes of nursing students regarding pain and pain management.

I understand my participation is completely voluntary and that I may withdraw from the study at any time without penalty and that decision will not in any way affect my course grades or my status as a student in the School of Nursing.

I understand I will be asked to complete a research questionnaire on two separate occasions. The questionnaire will be administered at the beginning of the semester and again at the end of the semester. The questionnaire takes approximately 30 minutes to complete.

I understand that my research forms will be kept confidential and that my identity will not be disclosed. I further understand that the research data will be reported only in aggregate form which will protect my identity. I am also acknowledging that the researcher will maintain a list of research participant names and telephone numbers to be used for emergency contact only and that the list will be kept in a locked cabinet accessible only to the researcher.

There will be no other agreements between individual participants and the researcher, either written or verbal, beyond that expressed in this consent form.

The purpose of the study has been explained to me and I may call Ruth Schaffler at any time at (253) 535-7680 if I have questions or concerns related to the study.

I, the undersigned, understand the explanations presented above and, on that basis, give my consent to participate in this research.

_____ _____

Signature of Participant Date

_____

Location (City, State)

_____ _____

Signature of Researcher Date

Appendix E

UNIVERSITY OF SAN DIEGO

Consent to Participate in a Nursing Research Study

Ruth L. Schaffler, a doctoral student at the University of San Diego, is conducting a research study to describe the knowledge and attitudes of nursing students regarding pain and pain management. I understand that I will be provided with information needed to enhance my clinical practice during this study and the research data will have important implications for nursing education.

I understand my participation is completely voluntary and that I may withdraw from the study at any time without penalty and that decision will not in any way affect my course grades or my status as a student in the School of Nursing.

I understand I will be asked to complete a research questionnaire on three separate occasions in addition to attending a class on pain management. The questionnaires will be administered at the beginning of the semester, immediately after an educational intervention, and finally at the end of the semester. The questionnaire takes approximately 30 minutes to complete.

I understand that my research forms will be kept confidential and that my identity will not be disclosed. I further understand that the research data will be reported only in aggregate form which will protect my identity. I am also acknowledging that the researcher will maintain a list of research participant names and telephone numbers to be used for emergency contact only and that the list will be kept in a locked cabinet accessible only to the researcher.

There will be no other agreements between individual participants and the researcher, either written or verbal, beyond that expressed in this consent form.

The purpose of the study has been explained to me and I may call Ruth Schaffler at any time at (253) 535-7680 if I have questions or concerns related to the study.

I, the undersigned, understand the explanations presented above and, on that basis, give my consent to participate in this research.

_____ _____

Signature of Participant Date

_____

Location (City, State)

_____ _____

Signature of Researcher Date

Appendix F

Outline of Curriculum for the Educational Intervention

I. Introduction of pain management
   - A. Definition of pain
   - B. Key terms related to pain management
     1. Tolerance
     2. Dependence
     3. Addiction
   - C. Prevalence of pain and impact on quality of life

II. Anatomy and physiology of pain
   - A. Gate control theory
   - B. Pain pathways
   - C. Brain interpretation of signals

III. Pain assessments
   - A. Patient reports
   - B. Common behavioral signs
   - C. Common physiological signs
   - D. Use of pain scales
     1. 0 to 10 rating scale
     2. Visual Analogue Scales (VAS)
     3. Faces scale
     4. Other visual scales

IV. Barriers to effective pain management
   - A. Patients' reluctance to report pain
     1. Stoicism
     2. Don't want to be a bother
     3. Fear of being labeled as a complainer
     4. Expect pain with certain diseases or conditions
     5. Societal anti-drug view
   - B. Communication
     1. Physical inability to report pain
     2. Language
   - C. Cultural variations
   - D. Nurses' interpretation of patients' complaints

V. Misconceptions of opioid therapy
   - A. Addiction
   - B. Narcotics should be saved for the worst pain
   - C. Only used for the weak

VI. Treatment of pain
- A. Pharmacologic agents
  1. Selected opioids and their differences
  2. NSAIDs and other non-narcotic agents
- B. Non-pharmacologic methods
  1. Massage
  2. Ice or heat
  3. Therapeutic touch
  4. Meditation
  5. Distractions

Appendix H

Permission Documents Pacific Lutheran University

PACIFIC
LUTHERAN
UNIVERSITY

PACIFIC
LUTHERAN
UNIVERSITY

Department of Biology
Tacoma, WA 98447-0003

253-535-7561 PHONE
253-536-5055 FAX
biology@plu.edu

Educating for Lives of Thoughtful Inquiry, Service, Leadership and Care

30 June 2005

Ruth L. Schaffler
School of Nursing
Pacific Lutheran University

Dear Ms Schaffler:

This letter is official verification that the PLU Human Participants Review Board (HPRB) has approved the following proposal:

"Nursing Students' Knowledge and Attitudes Regarding Pain and Pain Management"

We note that this is dissertation research being done through the University of San Diego, under the direction of Dr. Jane Georges, and that prior approval for the research was granted by the University of San Diego Institutional Review Board.

Sincerely,

Tom Carlson, PhD
Professor and Chair, Biology
Chair, PLU HPRB
(253) 535-7549
carlson@plu.edu

PACIFIC LUTHERAN UNIVERSITY

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Educating for Lives of Thoughtful Inquiry, Service, Leadership and Care

December 1, 2004

To Whom It May Concern:

This letter represents consent from the School of Nursing at Pacific Lutheran University (PLU) for doctoral candidate, Ruth Schaffler, to collect data from our students for her dissertation, "Nursing Students' Knowledge and Attitudes Regarding Pain and Pain Management", limited to the time period of January 1, 2005 through December 31, 2005.

Ms. Schaffler's quasi-experimental study requires a convenience sample of PLU's entry-level nursing students. It is understood that PLU students will be assigned to the experimental group, whereas students from a similar university will be assigned to the control group. A survey administered to the convenience sample during the first week of the spring 2005 semester with PLU students (experimental group) also receiving an educational intervention sometime later in the semester. Post-tests will be administered to the same group at the end of the same semester.

After discussion with the principal investigator and reading the proposal's summary, we believe Ms. Schaffler's purpose to examine nursing students' existing knowledge and attitudes about pain and pain management constitutes minimal risk to students and PLU, and both informed consent and confidentiality will be adequately assured.

Participation in the study is voluntary, using coded instruments and any data kept locked, under the investigator's control. Ultimately, data from this study will improve the core pain content in nursing curricula in general and PLU's in particular. Concurrent with the intent of the study, PLU strives to prepare future clinicians who will be knowledgeable and skilled at pain management, and improve the outcome of nursing care for patients experiencing pain.

Any questions or further information needed by the Human Participants Review Board at PLU or the University of San Diego in California are welcomed.

Respectfully

Terry W. Miller, PhD, RN
Dean and Professor

School of Health Sciences

3307 Third Avenue West, Suite 106
Seattle, Washington 98119–1922

206 281 2233 office
206 281 2767 fax

www.spu.edu

January 14, 2005

Dear Ms. Ruth Schaffler,

Your research project "***Nursing Students' Knowledge and Attitudes Regarding Pain and Pain Managenent***" has been approved under **exempt** IRB review and is in effect until **January 14, 2006.**

Your study has been assigned study number 04050104001. This study number and expiration date must appear on any participant recruitment material and your informed consent document.

Please contact me when you have completed collecting data for your study so that I can close your file.

If there are any changes in the protocol, and / or participant recruitment strategies, you are required to submit a memo to me outlining the proposed changes. If you need more than one year to complete data collection, you must file a request for an extension with me six weeks before the expiration date of this study. Use the study number 04050104001 in any further communication regarding this study.

Please feel free to contact me if you have any further questions.

Best wishes on your project

Mary E. Fry, Ph.D., RN
IRB member
Associate Professor of Nursing
School of Health Sciences