A PILOT STUDY OF TAILORED TEACHING ON NON-DRUG ENHANCEMENTS FOR MANAGING POSTOPERATIVE PAIN

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

NURSING

UNIVERSITY OF RHODE ISLAND

2005

DOCTOR OF PHILOSOPHY DISSERTATION

OF

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Dissertation Committee:

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DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND

2005

Abstract

The Agency for Healthcare Quality Research (AHRQ) cites the under-use of non-drug methods for pain management as among the top twenty-five issues in patient safety (AHRQ, 2001) in acute care hospitals. Little is known about patients' knowledge and attitudes towards non-drug interventions, especially in adult populations 50 years and older. Education is one strategy for improving patients' knowledge, attitudes and use of non-drug enhancements to complement pharmacological pain management. The primary purpose of this pilot study was to describe the usefulness of a tailored teaching intervention on three best practice protocols for music, massage, and self-guided imagery for pain management in postoperative patients age 50 and older experiencing joint replacement surgery.

A single group, non-experimental design was used with a convenience sample of 45 adults, aged 50 and older, undergoing joint replacement surgery requiring a minimum 3-day postoperative acute care stay. Data were collected using the *Non-Drug Complementary Pain Interventions Survey, and the Use of Non-Drug Complementary Pain Interventions Form [UNDCPI]* both developed for and piloted in this study. An adapted version of Ferrell's *Standard of Care Audit Instrument* was used to monitor data safety and adherence to study protocol guidelines.

Descriptive statistics were applied to analyze the data. Results showed that there were significant changes in subjects' knowledge and attitudes following use of the teaching intervention. Subject use of music, self-guided imagery, and massage increased over the four day acute care hospital stay, and subjects were satisfied with the choices of non-drug methods they chose as part of their pain management plan.

Acknowledgements

No work of this magnitude is ever easy nor is ever done alone. Reliance on multiple sources and forces shape the researcher and the project, often into something and someone never expected. The synergy of disciplinary, emotional, and even spiritual growth is a humbling experience and reveals the smallness of human understanding in the vastness of the universe. This is a work that has forever changed me in ways I never initially imagined.

First, I thank God – for giving me parents who inspired me to think critically and always answered my "but why?" questions during my youth. I also thank God for the gifts of intellectual ability, persistence, strength of body and spirit, and for the guides He sent to help me on my journey. I thank my family, especially my beloved spouse, Daniel, and our children Lisa, Michael, Scott, and Erin (and their respective spouses), for their *unwavering* support and encouragement and for their understanding and acceptance of my desire to take this journey.

I thank all my committee members for their willingness to aid and guide me in my work. I especially want to thank three individuals - my Major Professor, Dr. Marlene Dufault, a dedicated scholar, role model, and exemplary nurse researcher, for her patience, perseverance, and insightful guidance even when I was most discouraged; Dr. Stephen Kogut, a vivacious and supportive scholar, for his flexibility, directness, and genuine interest in helping me see this project to completion, and Dr. Susan Rossi whose expertise in data management was invaluable. I also thank Dr. Robert LaForge, a consummate scholar and researcher, for his direction in the preparation of survey instrumentation and for the engaging dialogue and debate

throughout the preparation of this dissertation. There are many others to thank as well, including Brenda Birck, the Interlibrary Loan Officer at Rivier College in Nashua, New Hampshire, for her untiring efforts to obtain the countless documents necessary to the pursuit of my goal; my classmates at the University of Rhode Island with whom I spent many hours debating and dialoguing about the coursework we undertook; and my professional colleagues in nursing at Rivier College and Regis College, some of whom took on extra work so I could dedicate myself to doctoral study and research; and the following organizations who helped partially fund this work – The Mayday Foundation, Delta Upsilon Chapter-at-Large of Sigma Theta Tau, and The New Hampshire Nurses' Association. I especially want to thank Drs. Christine O'Reilly and Grace Sullivan, for their help, support, and encouragement to 'get the job done'.

Without all of you, this work would have remained just a pipe dream – because of you, it will hopefully serve as a seminal work for future studies that help promote the use of non-drug methods for pain relief, advance the practice and science of nursing, and ultimately improve patient care.

"The real voyage of discovery consists not in seeking

new landscapes, but in having new eyes."

~ Marcel Proust

To Anne and Edward,

For their inspiration as my first teachers.

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Chapter 1

Introduction

The issue of inadequate pain relief has plagued hospitals, physicians, nurses, anesthesiologists, and patients for decades. At the outset of the 21st century, inadequate pain relief continues to be problematic as evidenced by consistently poor levels of pain relief still being reported in the nursing and medical literatures (Bucknall, Manias, & Botti, 2001; Carr, 1990; Cantrell, & Noyce, 2001; Schafheutle, Vega-Stromberg, Holms, Gorski, & Johnson, 2002; Solca, 2002). The National Institute for Nursing Research's (NINR) Priority Expert Panel D: Symptom Management -- Acute Pain supports the notion that inadequate pain management is an ongoing, common problem for the majority of hospitalized patients and *especially* an issue with older surgical patients. The Agency for Healthcare Quality and Research (AHRQ) cites the under use of non-drug methods for pain management as among the top twenty-five issues in patient safety (AHRQ, Evidence Report/Technology Assessment, No. 43, 2001). The AHRQ has already determined there is a rich and strong research base to support the use of certain complementary interventions as enhancements to drug therapy for surgical patients, but they are underused in practice (AHRQ, 2001). This concern must be addressed in a comprehensive manner, including initiatives at the individual patient, clinician, and organizational levels (NINR, 1994, 2003). Ineffective pain management inhibits many patients from adhering to the protocols for recovery from surgery.

The literature on non-drug pain interventions has repeatedly described the importance of relaxation as an essential first step in using 'best practice' protocols on

non-drug measures such s music, massage, and imagery (Benson, 1975; Flaherty & Fitzpatrick, 1978; Melzack & Wall, 1982). Benson's research with hypertensive patients led to the identification of four main elements that constitute the 'relaxation response': 1) a quiet environment, 2) an object to dwell on, 3) a passive attitude, and 4) a comfortable position (Benson, 1975). Early studies demonstrate that the combination of these four elements produces a beneficial state of relaxation shown to reduce blood pressure, decrease heart rate, slow respiratory rate, reduce metabolic rate, and enhance coping (Beary & Benson, 1974; Benson, 1975; Brod, 1960, 1964). In addition, McCaffery (1980, 1983) reports that relaxation training has many beneficial effects for patients, such as allowing patients to dissociate from their pain and reduce anxiety, easing skeletal muscle tension, decreasing fatigue, aiding sleep, and enhancing the effects of medications used to relieve pain. Not only do patients experience positive physiological changes when using relaxation techniques, but positive psychological outcomes may be experienced by patients such as peacefulness, increased tolerance for hospitalization routines, and improved mood (Kolkmeir, 1989). Music, massage, and self-guided guided imagery have been shown to produce a relaxation response (Benson, 1975; Halstead & Roscoe, 2002; Longworth, 1982; Swinford, 1987), improve health status (Hughes, 2003), and aid healing (Darnley-Smith & Patey, 2003; Mazo, 2002), thereby contributing to more positive pain management outcomes for patients.

Currently, the literature in nursing demonstrates that nurses do not apply what is known about the use of non-drug complementary pain interventions in their practices (Coyne, et.al., 1999; McMillan, Tittle, Hogan, Laughlin, & Tabler, 2000).

Common barriers to using current research (Dufault, Bielecki, Collins, & Wiley, 1995), especially about non-drug complementary pain interventions (Dufault, 2004; White, 1999), include nurses' lack of knowledge about the subject, and negative patient and clinician attitudes toward using such measures. Many problematic areas remain in the struggle to remove barriers to the use of research-based, non-drug nursing interventions for pain relief, such as improving nursing curricula to include more emphasis on pain theories, increasing emphasis on research related to complementary practices, focusing on developing pain services in healthcare organizations that include nurses who are experts in complementary therapies, and a renewed emphasis on developing useful and practical patient teaching materials. New teaching materials must clearly inform patients about the types of non-drug pain interventions that may be used, either singly or in combination, to enhance the effectiveness of drug therapy. It is believed by this investigator, that the aim of these new teaching materials should be directed toward teaching patients how to use non-drug methods in the context of a personalized, effective pain management plan. In addition, these materials need to teach patients about their rights and responsibilities regarding pain relief.

Patient teaching has been central to the role of the professional nurse and is considered essential for excellence in nursing practice. When focused on the specific issue of pain management, patient teaching can be described as the touchstone of effective pain management, especially in postoperative care (Ferrell & Rivera, 1997). The goal of patient teaching with surgical patients is to provide accurate information that will help prevent postoperative complications, increase self-care and

independence, and reduce the possibilities for readmission (Katz, 1997). Ineffective pain relief inhibits many patients from realizing this goal, and is commonly demonstrated by poor adherence to protocols for recovery. The nursing literature reports that many approaches to patient teaching regarding pain management are not producing the desired effects of pain relief for three primary reasons: (1) they fail to incorporate adequate information about non-drug complementary methods for pain relief, (2) they fail to attend to the unique characteristics of the individual, thereby offering information that may have limited or no meaning for the patient's specific situation, and (3) teaching is inconsistently recalled or not recalled at all by patients (Clarke, French, Bilodeau, Capasso, Edwards, & Empoliti, 1996; Marcum, Ridenour, Shaff, Hammonds, & Taylor, 2002; Miller, 1995; Ni, Nauman, Burgess, Wise, Crispell, & Hershberger, 1999). The use of well-developed and novel teaching materials on non-drug complementary pain measures may prove to be a reliable, cost-effective means of communicating with patients about ongoing pain-related issues and new, self-regulatory approaches to pain relief. By obtaining patient feedback on the usefulness of teaching materials, patients and professionals become partners in addressing issues of pain relief. As patients are invited to participate in developing their individualized pain management plan, their voices may be juxtaposed with those of experts to yield an educationally sound and pragmatic approach to non-drug pain management. Collaboratively developed teaching interventions may also offer patients more opportunity to make informed decisions that foster self-regulation and improve their ability to manage their own pain experiences. Patient feedback on the usefulness of teaching materials can also provide health professionals with new opportunities to

enhance the effectiveness of practice by aiding in the translation of research findings into evidence-based standards of practice.

Purpose of the Study

This research proposal is a sub-study of a parent study titled "Translating Best Practice in Non-drug Pain Management" (Dufault & Tracy, 2005). The parent study's purpose is to use an innovative approach to translate empirically tested non-drug interventions for pain management into cost-effective, easy to use, best practice protocols for hospitalized older adults undergoing surgery. A six-step "translating research into practice" model (Collaborative Research Utilization [CRU] Model) was used to develop and evaluate protocols used by a nurse-led, evidence-based, complementary (non-drug) pain management service in an urban community hospital. More specifically, the three non-drug interventions for which there is a strong evidence-base include massage, music, and self-guided imagery. In the preliminary work completed prior to this study, a team of multi-disciplinary clinicians and students generated three evidence-based "best practice" protocols for the nurse-led service (Appendices A, B, C). The primary purpose of this pilot sub-study is to describe the usefulness to patients of a tailored teaching intervention on these best practice protocols for music, guided imagery, and massage as developed in the parent study

Specific Aims

The specific aims of this pilot study were four-fold:

1. To describe how much patients knew, before and after using a tailored teaching intervention, about the purposes and benefits of using music, self-guided imagery, and massage as pain management strategies.

2. To describe patients' attitudes regarding the use of music, self-guided imagery, and massage as non-drug enhancements for pain relief before and after using a tailored teaching intervention,
3. To assess how frequently patients actually used music, massage, and self-guided imagery following teaching to help manage their pain during the first four days of their postoperative convalescence, and
4. To determine how satisfied patients were after teaching with the non-drug methods they chose as part of their overall pain management plan.

Significance of the Study

Inadequate postoperative pain management may prolong recovery, impede rehabilitation and patient participation in activities of daily living, or precipitate a variety of dangerous postoperative complications (AHRQ, 2001). Many patients have come to rely largely on the use of opioid medications to provide relief from postoperative pain, yet in hospitalized adults, especially older adults, pain is frequently under-treated with medications (Bell & Reeves, 1999; Faherty & Grier, 1984; Zalon, 1993) and with non-drug complementary interventions (Bell, 1997; Bell & Reeves, 1999; Carr, 1997; Ferrell, Grant, Chan, & Ferrell, 1995; Zalon, 1997). Finding effective, patient-centered solutions to the ongoing problem of pain management is a priority for research at the federal level and a national nursing research priority (AHRQ, 2001; NINR, 1994, 2003).

Patient teaching may be the most important psycho-educational tool nurses have to engage patients in self-regulatory behavior aimed at improving pain management and related health outcomes. Patient teaching may also be the most

important venue for patients to gain access to nursing expertise about using non-drug complementary pain interventions that may help them relieve their postoperative pain.

The customization of patient teaching information has been shown to make a beneficial difference in the ways in which patients use information, and in the meaning of information to the patient (Creamer-Bauer & Webber, 1990; Miller, 1996; Skinner, Stretcher, & Hospers, 1994; Watkins, Weaver, & Odegaard, 1986). In 1994, Skinner, et.al.demonstrated that letters promoting mammography tailored to women's' unique situations produced greater adherence to mammography screening and follow-up. Jibaja-Weiss, Volk, Kingery, Smith, & Holcomb (2003) recently replicated Skinner's work, demonstrating that personalized form letters may improve cancer screening among low-income and minority women. However, there is a lack of descriptive literature in nursing about strategies used to customize patient teaching on non-drug pain interventions. Research that aims at describing the utility for patients of tailored teaching materials on non-drug methods is needed, to include not only what patients know about non-drug methods (i.e. knowledge), but also what they believe about using non-drug methods for pain management (i.e. attitudes). Research is also needed that depicts the usefulness of tailored teaching on non-drug methods as measured by two factors: first, patients' actual frequency of use of music, massage, and/or self-guided imagery during the first three days of their postoperative recovery in the acute care setting, and secondly, the degree of satisfaction patients' have with using the non-drug interventions they have chosen as part of their pain management plan.

This research will be useful in the process of translating what is known about the use of complementary interventions into patient teaching standards of care for pain management. It will also: (1) fill a gap in the nursing literature, (2) provide a viable underpinning for changes in nursing practice regarding patient teaching that may, with further research, be transferable to other types of postoperative patients for improving pain management, (3) pave the way for the development of many types of similar tailored teaching interventions for other patient populations, and (4) provide a springboard for future outcomes research regarding evidence-based, best practices in patient teaching.

Chapter 2

Literature Review

Several bodies of literature helped to frame the ideas presented in this research. A brief overview of these literatures follows.

Overview of Arthritis and Osteoarthritis

The population of interest in this research is adults who undergo total joint replacement surgery of their knee(s) or hip(s). The primary cause for the replacement is commonly arthritis.

Arthritis is a term encompassing more than 100 diseases and conditions affecting the joints, their surrounding tissues, and other connective tissues. Taber's 19th edition defines 'arthritis' as "*joint inflammation, often accompanied by pain, swelling, stiffness, and deformity*" (Venes & Thomas, 2001, p. 169). In 1999, arthritis affected approximately 1 in every 6 citizens, more than 42.7 million Americans. However, it continues to be held that the prevalence of arthritis has long been under-reported. Current statistics from the Centers for Disease Control (CDC) show that nearly 70 million adults, that is, 1 in every 3, now have arthritis or some form of chronic joint symptoms (McCoy, 2002). While the prevalence is higher among women than men, all forms of arthritis have a significant effect on the quality of life for both clients and their families/care-takers. Osteoarthritis, often called 'degenerative joint disease', is the most prevalent form of arthritis, affecting approximately 49% of the total arthritis population (National Arthritis Action Plan (NAAP), 1999). Leading authorities from the Arthritis Foundation, the Association for State and Territorial Health Officials, and the Centers for Disease Control

previously estimated that approximately 21 million individuals suffer with osteoarthritis. In light of current CDC findings, this number is expected to grow substantially over the next seventeen years (NAAP, 1999), so that the previously expected 60 million adults with arthritis by 2020 will likely be closer to 90 million.

The major effects of osteoarthritis are pain, limited joint mobility and limitations in work, recreation, and usual activities, including basic self-care. Bone pain is a particularly difficult type of pain because of its continuous gnawing, aching presence that often influences many aspects of the patient's life. The pain and limitations in joint mobility restrict client independence and can result in emotional, social, and financial burdens for patients and their families. The costs associated with treating arthritis, its complications, and related disabilities are staggering. In 1995, the total national costs related to arthritis rang in at an overwhelming $65 billion; a figure that included medical visits, hospitalizations, rehabilitation, and lost wages for clients with arthritis (Yelin & Callahan, 1995). The growing prevalence of arthritis, a major component of which is osteoarthritis, bodes poorly for reducing or constraining these costs over the next twenty-five years. While not specifically a disease of aging, research by the Agency for Healthcare Research and Quality (AHRQ) shows that the effects of osteoarthritis accumulate as people age. Older Americans are among the most commonly affected and the least likely to seek out traditional or complementary resources than can relieve pain, increase joint mobility, and improve functional independence. In 1975, the President of the United States signed into law the National Arthritis Act authorizing expansion of research, treatment, public education, and training because arthritis had become, and continues to be, the nation's leading cause

of disability (CDC, 2003) and one of America's most pressing public health problems (NAAP, 1999). In fact, the health-related, sociological, and fiscal problems associated with osteoarthritis are expected to worsen if prompt, responsible action is not taken (NAAP, 1999).

When preventive measures, such as weight control, dietary therapy, and ongoing exercise therapy, fail to relieve disease symptoms, additional treatments are often advised (American College of Rheumatology, 2002). A common beginning involves the use of pharmacologic agents, such as non-steroidal anti-inflammatory medications, and an exercise program that balances flexibility, activity, and rest in order to improve joint mobility. If such measures are not effective and the disease advances to the point of disability, joint replacement surgery may be considered the client's best chance of returning to a less painful, independent lifestyle.

Although many factors must be considered before deciding to go forward with such surgery, the surgical procedure itself has been considerably refined over the last 15 years and frequently yields successful results for the majority of clients. Surgical repair and replacement of knee and hip joints provides durable pain relief and functional improvement in patients with osteoarthritis (Hochberg, et. al., 1995; Wright, et. al., 1999). The AHRQ total knee replacement Patient Outcomes Research Team (TKR PORT) showed that, despite the risk of complications, quality of life improves for the elderly after knee replacement surgery; elderly patients reported less pain and better physical function (Hawker, et. al., 1998). According to the American Academy of Orthopedic Surgeons, about 300,000 Americans undergo knee-replacement surgery every year, and osteoarthritis is the commonly the culprit

(National Center for Health Statistics, 2002). Over 70% of the 300,000 knee-replacement patients are people 65 years of age or older, with another 27% falling in the 45 to 64 year old age bracket. Clearly, many adults are able to benefit from this advance in medicine, but there are also responsibilities clients must accept if they are to return to the more active, independent lifestyle they remember prior to their disability.

Theoretical Underpinnings of the Study

A thorough search of the behavioral medicine, psychology, and nursing literatures found that no single theory addresses the complex nature of this study. A primary focus of this study is to determine if a patient teaching intervention on specific best practice protocols aimed at changing knowledge, attitudes, and behavior about the use of non-drug complementary pain interventions can be translated into clinical practice. While existing theories of pain describe the ways in which pain is transmitted, modulated, and perceived within the body (i.e. gate control theory, etc.), there are no prescriptive theories that address the type, pattern, or specificity of practice initiatives needed by clinicians to actually relieve [or at least, significantly reduce] acute pain (Good & Moore, 1996).

As a result, a blended theoretical approach will be used to frame this study. The theories that underpin this research include Good & Moore's Middle-Range Theory of Acute Pain Management in Adult Patients (1996), Fishbein & Ajzen's Theory of Reasoned Action (1975) (and its extension; The Theory of Planned Behavior [Ajzen (1985)]), Miller's Theory of Monitoring and Blunting (1987), Roger's (1983, 1995) Diffusion of Innovations Theory, and Dufault's Collaborative

Research Utilization Model (1995). In addition, a review of the patient teaching literature in nursing is presented to highlight the importance of patient teaching as a means of enhancing pain relief and encouraging patient participation in pursuit of pain relief.

Theory of Acute Pain Management.

In an exemplary article aimed at instruction on the development of middle-range theory, Good and Moore (1996) describe how clinical practice guidelines can serve as the underpinning for the creation of much needed theories in nursing science. Their Theory of Acute Pain Management (1996), formulated from the clinical practice guidelines of the Agency for Healthcare Quality Research (AHRQ, formerly the Agency for Healthcare Policy and Research [AHCPR]), provides a clear description of the processes necessary to create theoretical statements and empirically testable conceptual relationships aimed at addressing the clinical problem of interest, namely what is necessary to produce pain relief for the patient? In their third theoretical statement, Good and Moore (1996) state: "patient teaching plus goal setting for pain relief contribute to a balance between analgesia and side effects" (p. 77). Without appropriate teaching materials and realistic goal setting, Good and Moore (1996) suggest that patients may find "pain is unrelieved for hours when not followed by intervention" (p. 78). The potential for patient teaching to aid patients in pain relief rests primarily on the ability of the nurse to invite patients to participate in their own care. Attitudes, expectations, and knowledge must be addressed so that patients may contribute to the development of an individualized pain management plan that will be acceptable, and useful, to the patient (Good & Moore, 1996).

Theory of Reasoned Action and Planned Behavior.

The Theory of Reasoned Action (Fishbein& Ajzen, 1975) provides a framework to study attitudes as essential determinants of behaviors. Attitudes are determined by a person's beliefs about whether or not a certain behavior will lead to a certain outcome. Within this theory, the most important concept is the individual's *intention* to perform a given behavior. Intention is the combination of two primary elements: (1) one's *attitude* toward performing the behavior, and (2) the amount of [external] social pressure placed on the individual to behave in a certain way (Fishbein& Ajzen, 1975). The latter element is also known as the *subjective norm* regarding the act or behavior.

In 1985, Ajzen added a third element to the Theory of Reasoned Action that resulted in an extension of the theory that would come to be known as The Theory of Planned Behavior (Ajzen, 2002). The added element was the *perceived amount of control* the individual believed s/he had over the intended behavior. Perceived behavioral control is determined by two factors: control beliefs and perceived power (Brown, 1999). The combination of perceived control over performance of a behavior and the extent to which the person believes interfering conditions have the power to make the behavior easier or more difficult are directly related to the amount of *motivation* the individual has to perform the behavior. The more perceived control the person has, the greater the likelihood the individual will perform the behavior. While the Theory of Reasoned Action works very well in explaining and predicting behaviors under one's control, it does little to explain or predict behavioral acts outside one's volitional control, such as adverse health events. By adding the construct

of perceived behavioral control, the Theory of Planned Behavior is able to predict those behaviors over which individuals lack complete volitional control (Montaño, Kasprzyk, & Taplin, 1997).

Theory of Monitoring and Blunting.

The Theory of Monitoring and Blunting provides knowledge and empirical evidence about the ways in which patients' attitudes about and preferences for information influence patient outcomes. Miller's (1987) theory helped underpin the development of the tailored teaching pamphlets used in this study, in the hope that subjects would receive information in the style they most prefer. The short form of the Miller Behavioral Style Scale (MBSS) was used in this study as a screening tool to determine patient information coping style, and, ultimately, to determine which teaching pamphlet the subject would receive. Just as knowledge about attitudes is critical to an understanding of behavioral intention, so too knowledge about the ways in which individuals prefer to receive information about aversive events may be related to patients use of teaching materials. This theory offers a unique research opportunity for nursing to examine the effects of information coping style on the usefulness of patient teaching materials. The literature on monitoring and blunting in medicine and psychology provides some evidence that the individual's preference for information, especially in situations of perceived threat, is a stable personality trait and can be predictably used to develop interventions that will improve the utility of information for the patient (Lipkus, Rimer, Halabi, & Strigo, 2000; Miller, Leinbeck, & Brody, 1989; Miller, 1995; Miller, 1996; Skinner, et.al., 1994). Within the theory, monitors are individuals who seek information in the face of threat-

relevant cues, including health threats, so as to diminish their anxiety and decrease their uncertainty about the situation. Blunters are individuals who prefer to distract themselves from the psychologically overwhelming impact of the threatening event, and do so by attending primarily to procedural information and avoiding detailed information about the situation. The literatures in bio-behavioral medicine, psychology, and library sciences contain studies describing the use of information coping styles in preparing patients and/or students for various clinical procedures and/or in providing teaching in clinical settings (Baker, 1994; Baker, 1995; Cheng, Hui, & Lam, 2000; Livneh, 2000; Miller, Brody, & Summerton, 1988; Miller, et.al., 1989; Miller, Rodoletz, Schroeder, Mangen, & Sedlacek, 1996). However, the general nursing literature, and the nursing literature specific to patient teaching, is essentially devoid of clinical research regarding the feasibility and usefulness of teaching materials that consider information coping style a variable of interest in patient teaching. While not the central focus of interest, it is hoped that this study might lay some of the descriptive groundwork necessary for later outcome questions about whether or not coupling patient information coping style with tailored teaching techniques can produce measurable benefits in patient health outcomes.

Patient Teaching.

To provide for effective pain relief, nurses need to attend to the subjective experiences of each patient (Watt-Watson, Garfinkel, Gallop, Stevens, & Streiner, 2000). Individualized, patient-focused approaches to pain management incorporate patient selection of pain strategies, thereby allowing the patient's 'voice' to be heard. Individualized plans, such as these, use baseline admission data and the ongoing

assessment of patients to monitor and maintain effective, satisfying, patient-centered pain relief. Patient education is an integral part of that process in which patients are viewed as the central partner in their pain management plan during hospitalization. In addition, without patient teaching, how can nurses assure that postoperative patients have the right knowledge and skills to manage their own pain and facilitate comfort and recuperation once they are discharged from the hospital?

The value of patient teaching cannot be underestimated and is an important medium for communication of both emancipatory and pragmatic self-care information to patients and their families. Patient teaching aims to "empower patients with the responsibility for his or her own health care by improving health behaviors and health status" (Dunn, 1998, p. 277). Effective patient teaching also improves patient satisfaction with nursing care by narrowing the difference between anticipated and actual patient experiences. When patients are satisfied with the care they receive, they may be more likely to engage in learning activities that will further improve their condition and health outcomes, thereby creating a self-motivating cycle of continuous improvement, recovery, and responsibility for self-care.

As primary caregivers, nurses are responsible for teaching patients about the measures necessary to prevent postoperative complications and to return to their highest functional status. Nurses address this responsibility in two ways: as providers of bedside nursing care, and as teachers of care-related information both during hospitalization and following discharge. Teaching goes well beyond imparting knowledge and has the primary aim of using information to effect behavioral change

in patients (Morgan, Noll, Orleans, Rimer, Amfok, & Bonney, 1996; Saarman, Daugherty, & Riegel, 2000).

The major difficulty resulting from ineffective patient teaching is the lack of compliance patients' show with what they have been taught. The healthcare literature is filled with articles that describe problems with patient teaching, including poor medication adherence, lack of understanding of materials presented associated with poor readability, and general difficulties in getting patient education materials to 'stick'. For many years, corporations have struggled with similar questions about how to best reach their customers and acquire new ones. Ongoing research in marketing and customer communications found that customizing information enhanced customer attentiveness and recall, largely owing to personalization of marketing brochures, letters, and the like (Kreuter, Strecher, & Glassman, 1999). Customizing information has been a long-standing practice in the corporate world and offers one option for improving patient recall of teaching materials, thereby enhancing the 'usability' of information and, hopefully, improving patient outcomes.

Many approaches to patient teaching have failed to be effective in improving patient outcomes. Nurses identify three main factors that inhibit patient teaching: staffing, time, and lack of receptiveness of patients (Marcum, et. al, 2002). Ni, et.al., (2001) further identified that teaching sessions are inconsistently recalled by patients, thereby interfering with patients' ability to use valuable health information provided by the nurse. The literature on patient teaching suggests there may be tangible benefits to tailoring teaching interventions to be consistent with unique patient characteristics.

The question of whether or not coupling message-tailoring techniques with patient information coping style produces measurable benefits in patient outcomes remains to be tested. While the literatures of medicine and psychology offer many studies that demonstrate the ways in which information coping style is linked to patient outcomes, there is a paucity of research about whether or not teaching interventions that are tailored to an individual's information coping style and individual preferences have any significant effect on patient health outcomes. Specifically, there is a noticeable gap in the literature relative to the extent to which patient teaching has been customized to fit the particular patient's needs and information preferences, and whether or not such a strategy has any measurable effect on patient outcomes. Comprehensive searches of *CINAHL, Academic Search Premier, Healthsource: Nursing & Health,* and *MEDLINE* databases produced only three studies that examined the relationship between information coping style and patient teaching (Kwekkboom, K., 2003; Suls & Wan, 1989; Watkins, et.al., 1986).

Patient teaching may be the most important tool nurses have to engage patients in self-regulatory behavior aimed at improving pain management and related health outcomes. Patient teaching may also be an important venue for patients in gaining access to nursing expertise so as to learn about non-drug complementary interventions that may help relieve their postoperative pain. When tailored to their information coping style, patient teaching interventions about the use of best practice protocols on non-drug pain interventions may be shown to be effective in transforming the patient role from one of passive-recipient-of-care to one of active participant and regulator of their own care. Patient decisions about which strategies will be most helpful for them

in managing their postoperative pain result from the synergistic effects of personal knowledge, past experience, and the patient's openness to new strategies for pain relief. The customization of patient teaching information has been shown to make a difference in the ways in which people cope with information (Miller, 1987) and to influence patient responses to health directives. The use of tailored teaching interventions offers the potential for significantly improving the outcomes of patients' postoperative pain experience.

The Theory of Diffusion of Innovation.

Rogers' Diffusion of Innovation Theory (1983, 1995) is rooted in rural sociology and was directed at trying to understand how farmers learned about and came to adopt new farming techniques. The use of this theory has since spread to many disciplines. In healthcare, it is now primarily used to predict how health-related behaviors are disseminated, adopted, and managed by patients and organizations. The patterns of adoption can be described mathematically and several key theoretical concepts have been identified that focus not only on the diffusion process itself, but also on the channels of communication that distribute information about the innovation and about the environments into which the innovations are to be diffused (Oldenburg, Hardcastle, & Kok, 1997).

Rogers identified several stages within the process of diffusion. They are: innovation development, dissemination, adoption, implementation, and maintenance (Oldenburg, et al., 1997). While most diffusion takes place through informal processes, the deliberate creation of processes to ensure more widespread, smoother, and more enduring diffusion are becoming increasingly important, particularly as the

innovation requiring diffusion holds higher significance for the systems and/or environments being affected. These processes focus on creating support for innovations through (a) linkage agents who facilitate information delivery, (b) population feedback and troubleshooting, and (c) ongoing attention and adjustments to the channels of communication required to encourage adoption. Achieving satisfactory diffusion of innovation involves a mentality of openness to change, tolerance for diversity of thought, and a willingness to work together for the betterment of the whole. The processes of diffusion are ongoing and demand conscientious attention to detail, excellence in interpersonal interactions, and expertise in the use of multiple modes of communication that focus on the potential positive outcomes of the change.

Within the proposed research, the dissemination, adoption, and implementation of an innovative teaching intervention begin with openness. Openness to new ideas has the potential to generate new knowledge that may improve patient satisfaction, patient outcomes, and nursing practice. Knowledge about the practicality of the intervention for patients may be instrumental in adapting other types of teaching materials in the future; materials that potentially have far-reaching effects for both patients and clinicians.

Collaborative Utilization of Research Model.

A central model underpinning this study is the use of the Collaborative Research Utilization (CRU) Model (Dufault, 1995). The CRU is a six-step process involving partnerships between academic and clinical members and is built on principles and concepts contained in Rogers' Diffusion of Innovations Theory and in

the Conduct of Utilization of Research in Nursing (CURN) project (Horsley, Crane, & Bingle, 1978; Janken & Dufault, 2002).

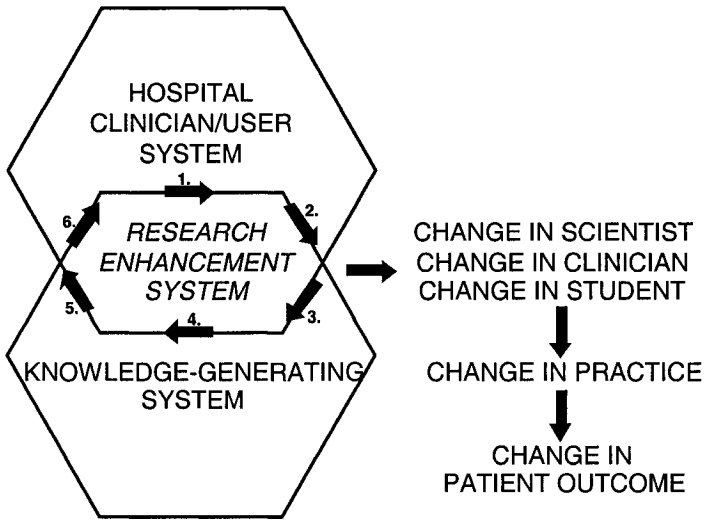


Figure 1. Six-step Collaborative Research Utilization Model

The CRU model aims at generating best practice standards, policies, and protocols in order to improve the clinical environment by facilitating research-driven change in practice, as well as developing present and future clinicians who are competent in these skills. It has been used to change nursing practice in 26 content areas of care in which there is a robust body of empirical knowledge that is under-used in clinical practice (Dufault, 2004). It has never been applied to the problem of the under-use of complementary pain interventions. Likewise, the uniqueness of this pilot sub-study, is that it has never been used to translate the tailored teaching interventions into nurses' daily care of postoperative joint replacement patients.

The six steps of the CRU approach include:

1. Identification of the clinical problem and assessment of the research bases for utilization,

2. Evaluation of the relevance of the research as it relates to the selected problem, agency values, standards and policies, and potential cost and benefits,
3. Designing a policy, standard of care, or protocol that meets the needs of the pain management problem,
4. Actual or construct replication and evaluation of the policy, standard of care, or protocol,
5. Decision to adopt, alter, or reject the policy, standard of care or protocol,
6. Development of means to disseminate and extend the innovation to other settings.

A comparison of the stages of Roger's Theory of Innovation Diffusion with the steps of Dufault's CRU model is seen in Table 1 below (Dufault, 2004). The operationalization of Steps 1, 2, and 3 of the CRU model as used in this study are described in the next section on Preliminary Work.

Preliminary Work using the CRU Model.

The CRU model was applied in preliminary work specific to this study at the study hospital where the interest in addressing the clinical problem of under-use of complementary pain interventions is high. Three of the six steps in the CRU model were completed in order to generate 3 evidence-based, best practice protocols for music, massage, and self-guided imagery. Worth noting, nursing scholars, researchers, and clinicians have laid much of the organizational groundwork necessary to pilot-test the tailored patient teaching intervention through the establishment of a nurse-led complementary pain service (called the Comfort Therapy Service) at the target

hospital. Several years have been spent developing the structural features, knowledge base, and interpersonal realities necessary to create and maintain such a service, to include the professional development of all who elected (at every organizational, and professional level) to support and become involved in its use.

Table 1.
A Comparison of the Stages of Roger's Theory of Innovation Diffusion With the CRU Model and Empirical Evidence of Its Usefulness

Stages in Rogers Theory of Innovation	Steps and Related Activities in CRU Model	Empirical Evidence
Agenda Setting	Identification of clinical problem as an organizational initiative. Operationalized through Focus group discussion and examination of quality data to identify patient safety and quality issues.	Innovation is likely to be integrated when congruent with organization initiatives (Dufault, et al, 1995, Rogers, 1995), and based on users needs (Brett, 1987, Titler, 1994).
Matching	Evaluating the relevance of the research as it relates to the selected problem, agency values, standards, and potential costs and benefits. Operationalized through Literature review and research roundtables.	Evaluating the applicability and methodological strengths in view of institutional standards allows innovation to viewed in context of own practice needs (Dufault, et al, 1995, Geertsma, Parker, & Whitbourne, 1982, Keller, Soule, & Wennberg, 1990, Lloyd & Abramason, 1979, Lomas & Hayes, 1988, Titler, 2002)
Redefining/ Restructuring	Designing an evidence-based standard, policy, or protocol. Operationalized through Interdisciplinary standards of care committee team meeting to draft best practice standards of care.	Using staff as opinion leaders via norms influences clinician behavior and alters group norms (Dufault, et al, 2002, Titler, 2002).
Clarifying	Evaluation of the standard, policy, or protocol for impact on patients and clinicians. Operationalized through Involving staff in testing new standards of care, protocol.	Involving staff in evaluation research study to test intervention may result in changing clinician practice (Dufault, 1995).
	Analysis of results and decision to adopt, revise, or reject the innovation. Operationalized through Patient safety and quality team meeting.	Integrating hospital quality teams to clarify the effects of evidence-based pain management clinical pathways improves outcomes (Dufault & Lessne-Willey, 1999).
Routinizing	Development of means to extend innovation. Operationalized through Changing the documentation system to cue, support, and sustain change in practice.	Development of cues to nurse action assists in integration (Dufault, et al, 1999).

Step 1, *identification of a clinical problem and assessment of the research bases for evidence of a solution*, was completed in May 2003. Initially, focus groups

led by the hospital's nurse researcher, along with participation by unit-level staff nurse council members, were held to identify common problematic areas in pain management care for which there is a strong body of empirically validated evidence. In 80% of the focus groups, the under-use of non-drug interventions for pain management surfaced as a central theme. A three-month chart audit was then conducted on the use of complementary interventions. Results indicated that zero percent (0%) of the charts audited revealed any documentation signifying that non-drug interventions were used to complement drug therapy for surgical patients. This is consistent with a study by Clarke, et.al., (1996) that found the documentation in other hospitals regarding non-drug treatments for pain was minimal to non-existent, with 90% of charts showing no evidence of the use of any non-drug interventions. Lastly, in step 1 it was necessary to determine whether or not a strong body of empirical evidence exists to support translation of research into practice. Between September and May 2003, a nurse researcher, university librarian, and several undergraduate nursing students from a local university undertook a comprehensive search of the literature. The search included documents published after the 1992 release of the Agency for Healthcare Quality Research's (AHRQ) Postoperative Pain Guide and focused specifically on music, self-guided imagery, and massage as non-drug complementary pain management interventions (AHRQ, Evidence Report/Technology Assessment, No. 43, 2001). In addition, this author conducted a comprehensive review of the patient education literature relative to the use of music, massage, and self-guided imagery as non-drug pain management interventions.

In step 2, *evaluating the relevance of the research as it relates to the selected problem agency values, standards and potential costs and benefits,* critiques of research evidence on music, massage, and self-guided imagery were conducted by clinicians and senior undergraduate nursing students from the same local university. Three research roundtables (one each on massage, music, and self-guided imagery) were conducted on two nursing care units responsible for the care of postoperative patients and focused on evaluating the research for clinical applicability, usefulness, and potential for translation into a target hospital's 'best practice' standards, policies, and protocols. Results of the examination would be applied to the standards, policies, and protocols that would be used by the complementary pain service nurses during this research. Stetler's (2001) tools for utilization-focused reviews were used to guide the roundtable discussions. Early versions of Stetler's model for evaluating the strength of the empirical evidence have successfully been used in other studies using the CRU model to get clinicians to examine and change their practice (Dufault & Lessne-Willey, 1999; Dufault, et.al., 1995; Dufault & Sullivan, 2000; Janken, Dufault, & Yeaw, 1988). The roundtables generated a total of 22 recommendations specific to the protocols for music, self-guided imagery, and massage as non-drug pain management interventions. Examples of recommended items include: assessing the patient's baseline pain level prior to initiating nondrug interventions; providing written and visual instruction related to using music, self-guided imagery, and massage; suggesting relaxed positioning, comfortable clothing, and quiet environment during use of nondrug methods; teaching patient to take cleansing breaths before beginning; encouraging patients to keep their eyes closed during use of the non-drug

interventions; encouraging patients to empty their minds of distracting thoughts while using nondrug methods; and use of soothing music [without words] during the music intervention.

Finally, step 3, *designing a policy, standard of care, or protocol that meets the needs of the pain management problem,* is focused on designing evidence-based "best practice" standards, policies, or protocols that conform to the organization's specific needs and can be translated into practice. A team of medical, nursing, complementary therapy experts, and research personnel within the target hospital was formed to develop and test the "best practice" protocols to be used by the Comfort Therapy Service nurses.

The protocols on music, massage, and self-guided imagery that emerged from steps 1 and 2 of the CRU process were used as a framework for the tailored patient teaching intervention which included teaching materials in the form of two teaching pamphlets (Appendices D & E), and an accompanying videotape (Appendix F). The tailored teaching intervention is composed of seven elements. Its features include: 1) assessing patients' information coping style; 2) assessing patients' prior use of non-drug interventions; 3) provision and review of a teaching pamphlet on music, massage, and imagery designed to match their scored information coping style; 4) optional viewing of a videotape explaining the teaching pamphlet information on using music, self-guided imagery, and massage; 5) development of a personalized pain management plan with a complementary pain service nurse; 6) daily follow-up during acute care hospitalization regarding the use of the non-drug interventions they selected as part of

their pain management plan; and 7) revision of the pain management plan as deemed necessary by the patient.

The three best practice protocols for massage, music, and self-guided imagery were also used to develop the survey instruments (Appendices G, H, I) that are central to the current research. Two matrices of objectives - one in the domain of knowledge and one in the domain of attitudes – were developed to link the best practice protocols to the content to be included in tailored patient teaching pamphlets and an accompanying videotape. Each matrix included objectives and potential survey items to assess patients' knowledge and attitudes related to the 3 best practice protocols. The matrix on attitudes contained items that were adapted from the work of Kreitzer, Mitten, Harris, & Shandling (2002) who compared the attitudes of medical, nursing, and pharmacy faculty and students toward the use of complementary and alternative methods in clinical practice. Specific measures from each matrix were selected for inclusion in the teaching pamphlets based on the extent to which the statement directly linked to one or more of the best practice protocols. A sample of each matrix may be found in Appendices J & K.

In Step 4, Actual or Construct Replication and Evaluation of the Innovation, the best practice protocols were to be tested and evaluated in the parent study. This sub-study was primarily focused on pilot testing the teaching intervention for its usefulness for patients. Specifically, this sub-study focused on assessing patients' knowledge, attitudes, and behaviors related to the best practice protocols on non-drug measures of music, self-guided imagery, and massage before and after teaching as well as patients' actual use of these three non-drug measures during their 3-day

postoperative acute care stay. Chapters 3, 4 and 5 of this dissertation focus on that evaluation.

In Step 5, the Decision to Adopt, Alter, or Reject the Innovation is made. Step 6 involves the Development of the Means to Disseminate and Extend the Innovation to Other Units or Settings. Chapter 5 of this dissertation addresses these two steps.

Summary of Literature Reviews

In summary, each of the theories and models described above has contributed to the theoretical framework for this study. Table 2, below, provides a brief review of the relationship between each theory used to underpin the development of the teaching intervention and selected salient features of the teaching intervention. The investigation of the related literature for this study demonstrated that no single theory could sufficiently respond to the multiple considerations that underpin the kind of patient teaching intervention that would stick with patients throughout their postoperative recuperation.

Table 2.
Theories and models used to construct teaching intervention

Theory or Model	Empirical Evidence	Salient Elements of Best Practice Teaching Protocol
Theory of Acute Pain Management (Good & Moore)	Attitudes, expectations, and knowledge must be addressed so patients can contribute to the development of their own pain management plan (Good & Moore, 1996).	Assess patients' knowledge about and ability to participate in the non-drug interventions.
Theory of Reasoned Action and Planned Behavior (Fishbein & Ajzen)	The more perceived control the person has, the greater the likelihood the person will perform the behavior (Brown, 1999).	Begin to assess patient's willingness to participate in self-guided imagery for pain control. Patients given a choice of different types of music. Individualized pain management plan developed by patient and comfort therapy nurse.
Theory of Monitoring and Blunting (Miller)	Individual's preference for information, especially in situations of threat, can be predictably used to develop interventions that will improve the utility of information for the patient (Miller, et.al.,1989; Skinner, et.al., 1994; Lipkus, et.al., 2000).	Screen patients for their information coping style. Provision of a teaching pamphlet designed to match their scored information coping style.
Theory of Diffusion of Innovations (Rogers)	Achieving satisfactory diffusion of innovation involves a mentality of openness to change, diversity of thought, and a willingness to work together for the betterment of the whole. (Rogers, 1983). One focus in process of diffusion is channels of communication that distribute information (Oldenberg, et.al., 1997).	Development of research roundtables to explore options for implementation of innovative teaching on non-drug methods of pain management. Recruitment and training of interested nurses to help with patient use of innovation and with data collection. Ongoing attention and follow-up by researchers to the channels of communication required to encourage adoption of the innovation.
Collaborative Research Utilization Model (Dufault)	Diffusion of innovation depends on mutual understanding by both staff and academicians of relevance of the intervention to resolution of the problem (Dufault, 2004). Usefulness of translating intervention into clinical practice is enhanced by integrating elements of research instruments into agency documentation (Dufault, 2004).	Creation and training of a complementary pain service. Generation of best-practice protocols on music, self-guided imagery, and massage. Integration of individualized patient pain management plan into agency's existing patient plan of care, computerized patient record, and quality improvement indicators.

Chapter 3

Methodology

The methodology provides the framework for the conduct of research within the study.

Research Questions

1. Does subjects' knowledge about the purposes and benefits of using music, massage, and self-guided imagery for pain management change after using a tailored teaching intervention?
2. Is there a relationship between subjects' knowledge of the purposes and benefits of using music, self-guided imagery, and massage for pain management and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style before and after teaching?
3. Do subjects' attitudes about using music, self-guided imagery, and massage for pain management change after using a tailored teaching intervention?
4. Is there a relationship between subjects' attitudes about using music, self-guided imagery, and massage for pain management and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style before and after teaching?
5. To what extent can subjects demonstrate "best practice" behaviors in using music and/or self-guided imagery after using a tailored teaching intervention?

6. Is there a relationship between subjects' ability to demonstrate 'best practice' behaviors for music, self-guided imagery, and massage and subjects' age, gender, marital status, educational level, prior use of non-drug methods, and information coping style after using a tailored teaching intervention?
7. Is there a relationship between subjects' prior use of music, self-guided imagery, and massage and subjects' actual use of music, self-guided imagery, and massage during subjects' acute care hospitalization?
8. Is there a change in use of music, self-guided imagery, and massage over subjects' day of surgery and first three days of postoperative recuperation following teaching?
9. How satisfied are subjects during the first three days following knee or hip total joint replacement surgery with the non-drug pain interventions they have chosen as part of their pain management plan?

Null Hypotheses

1. There will be no change in subjects' knowledge about the purposes and benefits of using music, self-guided imagery, and massage for pain management after using the teaching intervention as measured by the knowledge scales from the NDCPI Survey.
2. There will be no significant relationship between subjects' knowledge about the purposes and benefits of music, self-guided imagery, and massage for pain management and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style before and after using a tailored teaching intervention.

3. There will be no change in subjects' attitudes regarding the use of music, self-guided imagery, and massage for pain management after using a tailored teaching intervention as measured by the attitude scales from the NDCPI Survey.
4. There will be no significant relationship between subjects' attitudes about using music, self-guided imagery, and massage for pain management and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style before and after using a tailored teaching intervention.
5. There will be no significant relationship between subjects' ability to perform "best practice" behaviors in using music, self-guided imagery, and massage, and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style after using a tailored teaching intervention as measured by behavior responses on the NDCPI – Form C.
6. There will be no change in subjects' use of music, self-guided imagery, and massage over the four days of subjects' acute care hospital stay.

Definition of Terms

Throughout this study several terms are used to represent the major concepts and variables of interest for the study and are defined as follows:

Tailored Teaching Intervention – The process of individualizing the teaching on the non-drug methods of music, self-guided imagery, and massage for pain management associated with a personalized, patient-centered overall pain management plan developed by the patient and the complementary pain service nurse.

Non-drug complementary pain interventions – evidence-based, cognitive-behavioral activities, such as music, self-guided imagery, and massage, used either alone or in combination to augment the effects of prescribed pain-relieving medications.

Usefulness – the extent to which subjects actually use music, self-guided imagery, and/or massage measured by frequency of use data obtained from questions 1, 3, 5, & 6 on the *Use of Non-Drug Complementary Pain Interventions Form* (Appendix I).

Knowledge – what subjects understand about the purpose, benefits, barriers, timing, environmental requirements, and advantages of music, self-guided imagery, and massage as measured by changes in patient ratings on the knowledge items within the *Non-Drug Complementary Interventions Survey* before and after teaching.

Attitude – the subject's synthesized expression of his or her beliefs, thoughts, and feelings about the value, impact, potential for improving medical and nursing care, and personal importance of music, self-guided imagery, and massage as non-drug complementary interventions as measured by changes in patient ratings on the attitudes items within the *Non-Drug Complementary Interventions Survey* before and after teaching.

Behavior – the subject's perception about performance of specific acts related to the use of music or self-guided imagery regarding positioning, control of external and internal environmental features, and physical acts as measured by changes in patient ratings on the behavioral items within the *Non-Drug Complementary Interventions Survey* after teaching.

Soothing music – comforting, wordless compositions of various singular or blended tones and pitches of sound that assist subjects in becoming calm and relaxed as defined by subjects' perceptions and choice of musical selection.

Massage – the slow, gentle, rhythmical movements of the hands up either side of the spine and down the back, on the neck, or on the hands or feet using light pressure and uniform speed for three [or more] minutes at 60 strokes per minute.

Complementary Pain Service – [also known as Comfort Therapy Team] a team of staff nurses 1) trained in the use of best practice protocols on non-drug complementary pain interventions, to include music, self-guided imagery, and slow-stroke massage, 2) who actively participated in developing and designing the "best practice" protocols for each non-drug method, and 3) who collaborate with the patient in establishing an individualized pain management plan.

Information coping style – a distinctive cognitive-social framework for processing potentially threatening [health] information as measured by their net MB score on the short form of the *Miller Behavioral Style Scale* (Appendix J).

Monitoring – an information coping style characterized by searching for, attending to, and being highly sensitive to potentially painful, threatening, or dangerous aspects of information and experience (Miller, 1995).

Blunting – an information coping style characterized by avoidance of and distraction from potentially painful, threatening, or dangerous aspects of information and experience (Miller, 1995).

Self-Guided Imagery – a technique where the individual learns to substitute a non-painful sensation for a painful or unpleasant sensation by imagining or mentally reliving an enjoyable, relaxing experience.

Satisfaction – the degree to which an individual feels pleasure or contentment with the fulfillment of a need, desire, or choice.

Setting

The study site was an urban hospital that serves a high population of tourists, the military, and adults from the surrounding community that is similar in the percentage of minorities, gender, and socioeconomic status to other community hospitals in the state. It is medium-sized (148 beds), with the full range of services including inpatient and ambulatory surgery, acute inpatient care, emergency services, sub-acute services, and a wide range of community health education and prevention programs. The hospital typically admits joint replacement patients 50 and older to a surgical unit for 3 – 5 days of acute care stay, often followed by transfer to a sub-acute unit, where similar unit-based rehabilitation services are provided. The hospital has a contractual agreement with the University of Rhode Island College of Nursing as a clinical site for graduate and undergraduate students, as well as pharmacy students.

Nursing care hours per patient day compares favorably with that of other similar size hospitals, at 6.1 hours per patient day. The average length of stay for surgical patients is 4 days. At the study hospital, scores on Press-Ganey Patient Satisfaction with Pain Management index are 87.2 for 2003. Standards of pharmacological pain management care typically include the use of intravenous patient controlled analgesia being the preferred method of pain control for the immediate postoperative period (first 2 - 3 days). There is a striking lack of using non-drug pain interventions to enhance pharmacological interventions in the postoperative population that is typical of hospitals in the state of Rhode Island. For example, a preliminary audit of charts for patients who have previously undergone knee replacement surgery revealed no (0%) documentation of non-drug interventions of

massage, music, or cognitive-behavioral interventions despite nurses' verbal reports of teaching patients about non-drug approaches to pain management such as relaxation, and breathing techniques.

Sample

Sixty-six members of a convenience sample of 75 adults scheduled for knee or hip total joint replacement surgery were approached to participate in the study between March 2004 and April 1, 2005. From that population, 46 adults 50 years of age and older (male = 15, female = 31) who underwent knee or hip total joint replacement surgery requiring a minimum acute care stay of 3 days consented to participate. Eight patients declined, 1 patient withdrew, 6 patients were not approached, and 5 patients had changes in their pre-operative situation that made them ineligible to participate.

The sample size was chosen to provide pilot study information that may be helpful in determining future sample sizes for larger experimental studies involving this or other tailored teaching interventions and for purposes of feasibility / resource constraints. Eligibility criteria for participants included:

a. Fifty years of age or older,

b. Scheduled for elective knee or hip joint replacement surgery requiring a minimum acute care stay of 3 days,

c. Signed consent to participate,

d. Reads and speaks English,

e. Able to circle their responses on a written survey instrument,

f. Able to respond to verbal questions about their frequency of use of music, self-guided imagery, and/or massage.

All subjects who met the eligibility requirements were invited to participate in this pilot study. Subjects with corrected vision and/or corrected hearing deficits were included if they meet other eligibility criteria. Every effort was made to include subjects of varying racial and ethnic groups. No one who met eligibility criteria was excluded from the study on the basis of gender, race, country of origin, or religious preference.

Research Design

A single group, non-experimental pretest – posttest descriptive design was applied to explore subjects' knowledge, attitudes, performance abilities, use, and satisfaction with non-drug method choices before and after using a tailored teaching intervention. A descriptive design was utilized owing to the void in the literature related to the description and/or testing of tailored teaching on non-drug pain interventions. Descriptive statistics were used to analyze the independent and dependent variables of interest, to include frequencies and descriptive statistics (including measures of central tendency and variability (for continuous variables)), paired samples *t* tests, simple comparison of means, and bivariate correlations.

Operationalizing the Variables.

The independent variables included the tailored teaching intervention and the demographic variables, including age, gender, marital status, educational level, race, information coping style, and prior use of non-drug methods for pain relief. The dependent variables included subjects' perceived changes in knowledge, attitudes, and

behaviors related to music, massage, and self-guided imagery for pain management after the tailored teaching intervention. Usefulness variables included frequency of use of best practice protocols on music, self-guided imagery, and massage over the day of surgery and the first three days of postoperative recovery in the acute care setting, and subject satisfaction with the non-drug methods they chose as part of their individualized pain management plan. Table 3 provides a summary of independent and dependent variables of interest and the types of statistical tests used in the analyses of data. Specific information regarding the statistical approaches used for each research question is found in Chapter 4.

Table 3.
Independent and Dependent Variables of Interest, Items used for Measurement, and Statistical Tests used in Data Analysis

Dependent Variables of Interest	*Measure*	*Statistical Approaches*
Patient Variables (before and after the tailored teaching intervention) - Knowledge - Attitudes - Ability to demonstrate 'best practice' behaviors	Non-Drug Complementary Pain Intervention Survey: - Forms A & C – Items #1-17 - Forms A & C – Items #18 –30 - Form B – Items #1-12 - Form C – Items #31-38	• Descriptive statistics (frequencies, percents, means) • Bivariate analysis (Paired Sample T-Tests)
Usefulness Variables (per 24 hours over first four days of postoperative recovery in acute care setting) - Frequency of use of music - Frequency of use of imagery - Frequency of use of massage Satisfaction with non-drug pain relief methods chosen.	Use of Non-Drug Complementary Pain Interventions Form - Items # 1 & 2 - Items # 3 & 4 - Item # 6 Use of Non-Drug Complementary Pain Interventions Form - Items # 8 & 9	• Descriptive statistics (frequencies, percents, means) • Bivariate analysis (Paired Sample T-Tests)

Independent variables of interest were operationalized as follows:

Age: Subjects' age was included in the analyses as a continuous variable. For certain components of the analyses, subjects' age was recoded into groups for ease of presentation of the data and ease of comparison in various paired samples *t* tests so that 1 = 50 through 59, 2 = 60 through 69, 3 = 70 through 79, and 4 = 80 through 89.

Marital status: Subjects' marital status was included in the analyses as categorical data with subjects classified as 1 = married, 2 = single, 3 = divorced, 4 = separated, or 5 = widowed.

Education: Subjects' educational level was classified as 1 = less than high school diploma, 2 = high school diploma or GED, 3 = some college, 4 = college graduate, or 5 = graduate school.

Race: Subject race was captured as categorical data with 1 = white, non-Hispanic; 2 = black, non-Hispanic; 3 = Hispanic; 4 = Asian or Pacific Islander; 5 = American Indian or Alaskan Native; or 6 = Unknown.

Information coping style: Information coping style was classified as 1 = monitor or 2 = blunter based on their net MB score on the *Miller Behavioral Style Scale* (short form).

Prior use: Prior use of non-drug interventions for pain management for the past month was included as an ordinal variable and classified as 0 = no use, 1 = seldom use, 2 = occasional use, 3 = frequent use, 4 = very frequent use. Non-drug items about which subjects were questioned regarding prior use included massage, music, self-guided imagery, self-help education, prayer and/or meditation, yoga, acupressure, acupuncture, heat or cold, aromatherapy, herbs, and Reiki or Therapeutic Touch (See Demographic Data Form, Appendix L). A total use score was calculated by averaging the responses to items 12 through 23 of the Demographic Data Form and presented in the analyses as frequencies of use of non-drug measures prior to surgery. A subscale score specific to the use of music, self-guided imagery, and massage during the month prior to surgery was also used in the

analyses of the data and separately calculated by averaging subject responses on items # 1, 3, 5, and 6 of the *Use of Non-Drug Complementary Interventions Form (UNDCPI).*

Exercise: Data on exercise was captured in two ways: first, as a dichotomous response to whether or not subjects exercised regularly (1 = Yes, 2 = No), and secondly, as frequency of exercise prior to surgery, captured by subjects' classifying their exercise patterns as 1 = daily, 2 = every other day, 3 = twice a week, 4 = once a week, or 5 = not applicable.

Tailored Teaching Intervention: The tailored teaching intervention was a feature of the study design and operationalized by the implementation of the seven steps of the intervention protocol at specific times before and after teaching, to include 1) screening patients for their information coping style, 2) screening patients for their prior use of non-drug interventions, 3) provision and review of a teaching pamphlet on music, massage, and imagery designed to match their scored information coping style, 4) optional viewing of a videotape explaining the teaching pamphlet information on using music, self-guided imagery, and massage, 5) development of a personalized pain management plan with a complementary pain service nurse, 6) daily follow-up during acute care hospitalization regarding the use of the non- drug interventions they selected as part of their pain management plan, and 7) revision of the pain management plan as deemed necessary by patient feedback from the daily assessment of the patient's satisfaction with their individualized pain management plan.

Dependent variables of interest were operationalized as follows:

Knowledge: Subjects' overall knowledge about music, self-guided imagery, and massage was included in the analyses as a scale score by separately averaging subjects' responses to items 1 through 17 on the *Non-Drug Complementary Pain Interventions Survey* (NDCPI) before (pre-admission testing day [Form A]) and after (post-operative day 3 [Form C]) teaching. Survey responses for these items were classified using a Likert-type scale with 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, or 5 = strongly agree. Subject responses on knowledge items #2, 5, 9, 11, 13, and 16 of the NDCPI were reverse scored for consistency in comparing best score means before and after teaching, so that 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree for those items only. For some parts of the analysis, knowledge mean scores for NDCPI Form A and NDCPI Form C were recoded into a different variable to detect non-linear relationships and collapse mean scores into smaller ranges for ease of comparison in paired samples *t* tests so that 1 = knowledge mean scores from 35 through 55, 2 = knowledge mean scores from 56 through 59, and 3 = knowledge mean scores from 60 through 82. Pre-teaching and post-teaching subscale scores on knowledge for music, self-guided imagery, and massage were also included in the analyses and created by selecting specific items on the NDCPI (Forms A & C) pertaining to music, self-guided imagery, or massage. Subject responses to these subscale items were classified using the same Likert-type scale noted above. The subscale score on knowledge about music was calculated separately averaging subjects' responses to items 1, 3, 6, 7, 13, and 17 of the NDCPI before and after teaching. The subscale score on knowledge about massage was

calculated by separately averaging subjects' responses to items 2, 5, and 8 of the NDCPI before and after teaching. The subscale score on knowledge about self-guided imagery was calculated by separately averaging subjects' responses to items 10, 11, 12, and 15 of the NDCPI before and after teaching. In addition, subscale scores on general knowledge pertaining to the purposes and uses of non-drug methods were separately created before and after teaching from items that did not specifically relate to knowledge about music, self-guided imagery, or massage and included items 9, 14, and 16 of the NDCPI. Table 2 provides a summary of items used to construct knowledge and attitude subscale scores for music, self-guided imagery, and massage from the NDCPI (Forms A & C).

Attitudes: Subjects' overall attitudes about using music, self-guided imagery, and massage for pain management as well as overall subject attitudes about the use of non-drug measures in nursing and medical practice were also included in the analyses as a scale score by separately averaging subjects' responses to items 18 through 30 on the *Non-Drug Complementary Pain Interventions Survey* (NDCPI) before (pre-admission testing day [Form A]) and after (post-operative day 3 [Form C]) teaching. Subject responses were classified as 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. Subject responses on attitude item #22 of the NDCPI (Forms A & C) were reverse coded for consistency in comparing best score means before and after teaching, so that 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree. Mean attitude scores for both NDCIP Form A responses and NDCIP Form C responses were recoded into a different variable for ease of

comparison of the means so that 1 = attitude mean scores from 22 through 24, 2 = attitude mean scores from 25 through 32, and 3 = attitude mean scores from 33 through 40.

Table 4.
Knowledge, attitude, and general items from the NDCPI (Forms A & C) used to construct subscale scores on music, self-guided imagery, music, and general non-drug issues

Subscale	NDCPI Knowledge items	NDCPI Attitude items
Music	~ The main reason for listening to music is to increase the effects of pain medicine. ~ Listening to soothing music is supposed to increase the helpful effects of pain medicines. ~ Listening to soothing music allows me to take a more active part in dealing with my pain. ~ The most common reason music is not used more for pain relief is lack of desire to try it. ~ There are no special times when music will work best to help get a better effect from pain medicines. ~ Music is most helpful when a person wants to ease the tension and anxiety that often go along with pain .	~ Listening to soothing music may be an important tool for helping treat pain after surgery. ~ I plan to continue listening to soothing music to relax me after I go home from the hospital. ~ I believe listening to soothing music helps with the treatment of pain.
Self-Guided Imagery	~ Using imagery can help a person feel less anxious. ~ The best time to use imagery is just after I take a pain medicine. ~ Before using music or imagery, I must be sure to choose a quiet place and get in a comfortable position. ~ The use of imagery can improve the effects of pain medicines.	~ I don't believe guided imagery has any true effect on the treatment of pain. ~ Using imagery may be a helpful tool in treating pain after surgery. ~ I plan to use imagery to help deal with my pain when I go home from the hospital.
Massage	~ Slow stroke massage helps me relax most when my pain level is really bad. ~ The main purpose of massage is to stop me from thinking about my pain. ~ The main benefits of massage are to lessen pain and improve rest.	~ I believe massage can reduce my stress.
General items	~ Non-drug measures work best to relieve severe pain. ~ People get the most benefit from non-drug methods when their pain is mild to moderate. ~ There are no good reasons for using non-drug measures along with pain medications .	~ Nursing care should include the best of non-drug practices. ~ Usual medical practice could benefit from using non-drug methods like music, imagery, and massage. ~ Nurses should be able to tell their patients about using music and imagery to be more relaxed. ~ I believe a mixture of music, massage, and imagery will help me change the way I cope with pain in the future. ~ Knowing about non-drug pain methods is important to me as a patient. ~ Teaching booklets given to patients before surgery should explain how to use non-drug methods for pain relief

Subscale scores on attitudes about using music, self-guided imagery, and massage were also included in the analyses and created by selecting specific items on the NDCPI pertaining to music, self-guided imagery, or massage. Subject responses to these subscale items were classified using the same Likert-type scale noted above. The subscale score on attitudes about using music was calculated by separately averaging subjects' responses to items 19, 25, and 27 of the NDCPI before and after teaching. The subscale score on attitudes about using massage was calculated by separately averaging subjects' responses to items 22, 24, and 29 of the NDCPI before and after teaching. The subscale score on attitudes about using self-guided imagery contained only one item, # 21, on the NDCPI and was used in the analyses of attitudes about the use of self-guided imagery before and after teaching. In addition, subscale scores on general attitudes pertaining to the use of non-drug methods were separately created before and after teaching from items that did not specifically relate to attitudes about music, self-guided imagery, or massage and included items 18, 20, 23, 26, 28, and 30 of the NDCPI.

Behaviors: Subjects' overall behaviors related to the use of music, self-guided imagery, and massage for pain management were also included in the analyses as a scale score by averaging subjects' responses to items 31 through 38 on the *Non-Drug Complementary Pain Interventions Survey* (NDCPI) after teaching only (Form C). Before-teaching behavior scores were not calculated owing to the subjects' failure to practice best practice behaviors before the day of surgery, resulting in insufficient data for analysis on survey items 4 through 12 on the NDCPI (Form B). Responses for items 31 through 38 on Form C of the NDCPI were classified using a

Likert-type scale with 1 = none of the time, 2 = less than ½ the time, 3 = half the time, 4 = more than 1.2 the time, and 5 = all the time. No subscale scores were created for behaviors. Mean behavior scores for the NDCPI (Form C only) were recoded into a different variable to collapse mean scores into smaller ranges in order to detect non-linear relationships and for ease of comparison with other recoded scores on knowledge and attitudes so that 1 = mean behavior scores on the NDCPI (Form C) from 22 through 24, 2 = mean behavior scores on the NDCPI (Form C) from 25 through 32, and 3 = mean behavior scores on the NDCPI (Form C) from 33 through 40. The lack of pre-teaching data on subject behaviors specific to the use of music, self-guided imagery, and massage precluded the necessity for creation of specific post-teaching subscale scores on the use of music, self-guided imagery, and massage.

Usefulness variables were operationalized as follows:

Frequency: Frequency of use of all types of non-drug interventions during the month prior to surgery was captured in the form of a scale score and displayed in the analyses as frequencies and means to describe the patterns of non-drug method use of subjects during the month preceding their surgery. Use was classified as 0 = no use, 1 = seldom use, 2 = occasional use, 3 = frequent use, 4 = very frequent use. Use was classified as 1 = none, 2 = one, 3 = two, 4 = three, 5 = four, or 6 = five or more. Post-teaching use of music, self-guided imagery, and massage was used in the analyses of the data and captured as scale scores calculated separately for the day of surgery and the first three days of post-operative recuperation using the same items

noted above from the UNDCPI. Use was again classified as 1 = none, 2 = one, 3 = two, 4 = three, 5 = four, or 6 = five or more.

Satisfaction: Satisfaction was included in the analyses and displayed as frequencies and a single mean. Data on satisfaction was captured as 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied or dissatisfied, 4 = satisfied, and 5 = very satisfied.

Data Analysis Methods

The aims of the data analysis were seven-fold: 1) to determine if there were any changes in subjects' knowledge regarding the purposes and benefits of using music, self-guided imagery, and massage for pain management before and after teaching, 2) to determine if there were any changes in subjects' attitudes about using non-drug methods for pain management before and after teaching, 3) to determine the extent to which subjects' could demonstrate best practice behaviors in using music, self-guided imagery, or massage after teaching, 4) to determine if there were any relationships between knowledge, attitudes, or behaviors and the demographic variables of age, gender, educational level, information coping style, and prior use of non-drug methods, 5) to determine how much subjects' actually used the best practice protocols for music, self-guided imagery, and massage for pain management after teaching during the first four days of their acute care postoperative recuperation, 6) to determine if there were any relationships between subjects' prior use of music, self-guided imagery, or massage and subjects' in-patient use of music, self-guided imagery, or massage, and 7) to determine how

satisfied subjects' were with the non-drug methods they chose as part of their pain management plan over the first four days of postoperative recuperation.

The data on 46 consenting subjects were entered into an SPSS (v.12) file on the dedicated laptop computer housed in the research office at the study site. Frequencies of responses were calculated for the demographic characteristics of the sample, including age, gender, race, marital status, educational level, information coping style, and prior use of non-drug measures. Descriptives statistics related to the pre-intervention and post-intervention knowledge and attitude scores were also calculated to include frequencies, means, medians, mode, and standard deviations. Using paired samples *t* tests, the means of pre-intervention (pre-admission testing day) and post-intervention (post-operative day 3) 'total knowledge scores' were compared to determine if there were any changes in the means related to knowledge about the purposes and benefits of using music, self-guided imagery, and massage for pain management. Correlations between the pre-intervention and post-intervention total knowledge scores and the demographic variables of age, educational level, and prior use of non-drug methods were then separately calculated using bivariate analysis. The three subscales on knowledge – one for each of the three non-drug methods of music, self-guided imagery, and massage - were also analyzed using paired samples *t* tests (alpha = 0.05 (2-tailed)) to determine if there were any significant changes in subjects' specific knowledge about the benefits and purposes of using music, self-guided imagery, and massage as non-drug methods for pain management before and after teaching.

An identical process was then undertaken to compare total attitude scores before and after teaching and attitudinal subscales before and after teaching. Paired samples *t* tests were likewise performed using pre-intervention (pre-admission testing day) and post-intervention (post-operative day 3) attitude scores on music, self-guided imagery, and massage, and separate correlations were run to determine whether or not there were any relationships between subjects' attitudes about non-drug pain interventions before and after teaching and the demographic variables of age, educational level, or prior use of non-drug methods. In the absence of pre-intervention behavior data, the mean on the post-teaching total behavior scale was compared to the mean of subjects' prior use of non-drug methods during the month preceding their surgery using a paired samples *t* test to determine if there was any relationship between prior use of music, self-guided imagery, and massage and post-teaching behaviors related to the use of music, self-guided imagery, and massage for pain management.

Descriptive statistics in terms of frequencies, means, mode, and standard deviations were also obtained for subject responses on the *Use of Non-Drug Complementary Pain Interventions Form* for the day of surgery (DOS) and the first three days of postoperative recuperation, and paired samples *t* tests were performed to determine if there were changes in subjects' use of music, massage, and self-guided imagery over the subject's post-operative recuperation.

Lastly, frequencies and a mean were obtained related to the subjects' perceived satisfaction with the non-drug methods they chose to use as part of their overall pain management plan.

Instruments

Demographic data were collected on all subjects, including age, gender, race, marital status, educational level, prior use of non-drug complementary pain interventions, and usual exercise regimen. The *Demographic Data Form* was created for and used in this study.

The long form of the *Miller Behavioral Style Scale* (Miller, 1987) (Appendix M) is a 32-item measure that is used to differentiate between individuals who actively seek out threat-relevant information and those who distract themselves from threatening information (Miller, 1987; Rees & Bath, 2000). The short form of the scale (Appendix N) uses two stress-evoking scenarios of an uncontrollable nature, each followed by eight statements that represent different ways of coping with the situation. Four of the eight responses in each scenario are those that monitors might use, while the remaining four responses are those that blunters might use. Subjects would be asked to mark all statements beneath each scenario that represent the ways in which they might respond. The short form of the scale has been reported to yield results consistent with the long form (Steptoe, 1989), and was chosen as a screening tool for this study owing to its ease of administration, low complexity, and ease of scoring. Most importantly, the short form of the scale was chosen to aid the researcher in tailoring the teaching intervention to the subject's information coping style.

The Non-Drug Complementary Pain Interventions Survey instrument was developed for and piloted in this study to explore subjects' perceptions about their knowledge, attitudes, and behaviors related to the use of best practice protocols on music, massage, and self-guided imagery for use in postoperative pain management.

The various theories that support this research and knowledge gained from conduct of the research roundtables provided the framework within which knowledge, attitudinal, and behavioral content objectives for the teaching pamphlet were designed. As noted earlier in the discussion of the steps of the CRU model, selection of items for inclusion in the survey were related to each of the non-drug complementary methods and theories that framed the construction of the teaching and attitudinal objectives. Additional information relative to the role of each of the major theories underpinning the survey may be found in Appendix O.

Three forms of the *Non-Drug Complementary Pain Interventions Survey* instrument were constructed. Form A contains 30 questions (Appendix G). The first 17 questions are used to assess subject knowledge about the purposes and benefits of using music, self-guided imagery, and massage for pain management prior to the teaching intervention. Form B contains 12 questions (Appendix H) and was used prior to surgery after the subject had a chance to read the tailored teaching pamphlet and practice using the best practice protocols on music and self-guided imagery at home. Form B's purpose was to assess the extent to which subjects could perform the 'best practice' behaviors contained in the teaching pamphlet prior to surgery. Form C (Appendix I) is a composite of forms A and B, and was used at the end of the patient's acute care stay. The purpose of Form C was to assess subjects' knowledge, attitudes, and behaviors related to the use of the best practice protocols on music, self-guided imagery, and massage as non-drug complementary pain management interventions after exposure to the tailored teaching intervention and after having the experience of using these methods.

All forms of the survey instrument were easy to administer, taking only 5 to 15 minutes to complete. Pilot testing of forms A and C of the survey instrument was conducted with a group of 15 well adults 50 and older prior to use in this study. In the well adult pre-study sample, Form A of the survey instrument took an average of 10 minutes to complete, and Form C took an average of 13 minutes to complete. Content validity for survey items was obtained through review by a panel of four (4) experts in nursing education and practice to ensure that survey items assess knowledge, attitudes, and behaviors related to what patients needed to be taught regarding music, imagery, and massage as complementary pain interventions. Reliability of the survey scores was examined within the context of the study to ensure that the scores obtained were a true reflection of the survey's internal consistency and an indication of the stability of the survey over the time needed to accrue the study sample.

Descriptive data on subject frequency of use of music, self-guided imagery, and massage for pain management was also collected using the *Use of Non-Drug Complementary Pain Interventions (UNDCPI) Form* (Appendix P), also developed for use and piloted in this study. The UNDCPI was used to collect data on the day of surgery and the first three days of postoperative recuperation by documenting actual frequency of subject use of non-drug methods (i.e. music, self-guided imagery, and massage) over the previous 24-hour period. In addition, the form collected data on the subject's satisfaction with the non-drug methods they chose as part of their overall postoperative pain management plan. The form is easy to use and understand and took the complementary pain service nurses no more than 5 minutes to complete. Members

of the complementary pain service examined this form for content and usefulness for completion during the study.

An adapted version of Ferrell's 1999 *Standard of Care Audit Instrument* (Appendix Q) was used to monitor the extent to which subject's complementary pain service nurse documented the use of "best practice" protocols on music, massage, self-guided imagery, and imagery in the subjects' medical record. The audit instrument had been used in previous studies to provide details about whether the individualized pain treatment plans and protocols were followed (Ferrell & Borneman, 1999; Dufault & Lessne - Willey, 1999). In addition, the audit instrument was used to collect data on the plan for subject use of complementary pain interventions, documentation of use of planned pain interventions, use of pain-related consultant services, and any other observations pertinent to the pain management plan.

The *Study Protocol Assurance Checklist* (Appendix R) was developed for use in this study to ensure adherence to the approved and established protocols for implementation of the study. In addition, the form served to aid in data safety management by guiding the consistency of each aspect of data collection with each subject.

Data Collection Procedures

Subject Recruitment.

A rolling recruitment of subjects scheduled for knee or hip total joint replacement surgery took place over 12 months. During the planning phases of the research, several events were undertaken to facilitate the accrual of qualified subjects

into the study. First, meetings were held with the primary orthopedic surgeon at the study hospital and with personnel in the pre-admission testing department. These meetings helped orient the surgeon and personnel in the pre-admission testing office about the nature of the study and garner their support. Secondly, arrangements were made with personnel in the orthopedic surgeon's office to ensure that subjects scheduled for knee or hip total joint replacement surgery were made aware of the need to appear at the hospital approximately one week prior to surgery, to complete preadmission testing. Personnel in the preadmission testing department were informed about selection criteria for the study. Arrangements were made to obtain information about the name, phone number, and upcoming date for preadmission testing of subjects scheduled for knee or hip total joint replacement surgery. Each week, the researcher called a member of the preadmission testing department to inquire about potential subjects who met the eligibility criteria to plan for their recruitment. Most joint replacement surgeries were scheduled for Mondays or Thursdays at the study site, making it helpful in scheduling research assistant time for subject accrual.

As a pilot study, and in response to a request made by hospital nursing administration, an informal account of the time needed to carry out selected portions of the study procedure as noted on the *Study Protocol Assurance Checklist* was kept during data collection. Mean times for selected portions of the study are presented under findings in Chapter 4. A detailed narrative account of the process of data collection is presented below.

Preadmission Testing Day.

Typically, subjects come to the hospital one week prior to their surgery for preadmission testing. On the preadmission testing day, following completion of the subject's pre-admission testing, a member of the research team approached the subject to explain the study and invite them to participate. If the subject agreed, the researcher and the subject walked to the nursing unit so the patient could tour the location where they would convalesce for the first three to four days following surgery. If the subject had difficulty walking, a wheelchair was offered. The nursing unit made a conference room available so that the researcher could explain the study and collect the initial data in a private environment. The nurse researcher then explained the study to potential subjects and obtained subjects' signed written consent to participate. In addition, a signed written consent that HIPAA guidelines had been explained to them was also obtained. Subjects were given a copy of each signed consent. Once consents were obtained, subjects were screened for any past history of mental illness requiring psychiatric intervention in order to determine the subject's eligibility for using imagery. No subjects were excluded from the study as a result of this screening.

The researcher then assessed subjects for their Information Coping Style using the short form of the *Miller Behavioral Style Scale* [MBSS] (Appendix N). Demographic data about the subject's age, gender, marital status, educational level, race, prior use of non-drug methods for pain control, exercise habits, and frequency of exercise were then collected by the researcher using the Demographic Data Form created for this study (Appendix L). The subject was then asked to complete *Non-Drug Complementary Interventions Survey* – Form A.

The Teaching Intervention.

Once the survey was complete, the patient teaching intervention was conducted by the researcher to include: a) presentation and explanation of a teaching pamphlet developed to coincide with the subject's information coping style, b) an offer for the subject to view a short video on use of music, self-guided imagery, and massage, and c) instructions for the subject to read the teaching pamphlet prior to returning to the hospital for their surgery. The final part of data collection on the pre-admission testing day involved the development of an individualized pain management plan. Some subjects indicated that they would rather wait and develop their individualized pain management plan until they read the teaching pamphlet, their surgery was over, and they had an opportunity to actually try the methods during their recuperation. Other subjects' self-selected non-drug interventions as part of the development of their pain management plan. At the end of the data collection session, the researcher again instructed the subject to read the teaching pamphlet at home and, if possible, use the best practice protocols in the pamphlet to practice using music and self-guided imagery at home prior to day of surgery. Subjects were asked if they had any questions and encouraged to call a member of the research team if questions arose regarding the study during the week before surgery.

Once the researcher completed data collection on the preadmission testing day, the subject's file containing the blank forms to be used for data collection following surgery was given to the nurse manager who was the research project manager at the study site and responsible for follow-through on data collection on the nursing unit following surgery. In her absence, the subject's file was given to the Assistant Nurse

Manager for the unit. In compliance with data safety and monitoring guidelines, all data collected on the preadmission testing day was placed in a locked file cabinet and kept in the researcher's double-locked office in the basement of the study site. Locked file cabinets were also placed on the patient care unit.

Night before Surgery.

On the night before surgery, the researcher telephoned each subject whose surgery was scheduled for the next morning. During this phone call, the researcher administered the Non-Drug Complementary Interventions Survey – Form B and reminded the subject about the collection of data during the first four days of their surgical recuperation. The researcher answered any questions subjects had and reminded subjects they could call the researcher if they had any additional questions about the study prior to surgery.

Post-Operative Acute Care Days.

On the evenings of the day of surgery, and on postoperative evenings one, two, and three, the complementary pain service nurse questioned each subject about how often he or she had used each type of non-drug complementary pain intervention over the last twenty-four hours, and how satisfied they currently were with their choices. Data collected each evening by the complementary pain service nurse was documented on the *Use of Non-drug Complementary Pain Interventions Form* (UNDCPI) for study subjects and placed back in their confidential research file.

Acute Care Day of Discharge.

On the last postoperative day in acute care, sometime prior to discharge or transfer from the acute care unit, the nurse responsible for the subject's care asked the subject to complete *The Non-Drug Complementary Interventions Survey – Form C.* In addition to the documents used for data collection, a *Study Protocol Assurance Checklist* (Appendix N) was included in each subject's research folder as part of the data monitoring and safety aspects of the study and to ensure consistency for the conduct of all aspects of the study with each subject.

Human Subjects Information

The study met three levels of Institutional Review Board Review (IRB). The University of Rhode Island (URI) required the researcher to take appropriate measures to meet federal guidelines for research using human subjects and to provide written evidence of completion of a study session on human subjects research. Lifespan Hospital Corporation required similar evidence and further required construction and use of a second, separate consent form to be signed by each subject relative to the Health Insurance Portability and Accountability Act (HIPAA). Subjects were required to sign both the consent to participate and the consent regarding HIPPA guidelines before any data could be collected. Newport Hospital, as a member of Lifespan Corporation, also reviewed the research proposal for potential violations of human subjects' rights and for consistency with Newport Hospital guidelines for research using human subjects. According to study proposal, a Data and Safety Monitoring Board (DSMB) was established for this research and reviewed the first ten (10) records of study subjects to ensure compliance with HIPPA and Lifespan ethical

standards for the conduct of research involving human subjects. Members of the DSMB received raw data reports and, following review, provided feedback to the principle investigator and the research team. No adverse events or breaches of protocol were found in this review. An audit by the Office of Research Administration for Quality Assurance/Quality Improvement at Lifespan revealed the study met all Lifespan regulations and standards and cited the study as 'well organized', indicating data were 'well maintained' (copy of letter in Appendix S).

As required by Lifespan regulations and standards for research involving human subjects, all raw data obtained by the research team were stored in individual subject folders in a locked file cabinet in a double-locked office at Newport Hospital. Raw data were entered into an SPSS (v.12) file that resides on a dedicated, stand-alone laptop computer also stored in the locked file cabinet in the research office at Newport Hospital. At no time were any data on any subject transmitted or received electronically and the dedicated laptop did not leave the double locked office at any time. Further, all statistical analyses of data were performed solely on this dedicated laptop computer.

Chapter 4

Results

This pilot study explored two main aspects of non-drug pain management in adults 50 years and older who underwent knee or hip total joint replacement surgery: 1) subject knowledge, attitudes, and behaviors about best practice protocols on music, self-guided imagery, and massage for pain management, and 2) subject use of music, self-guided imagery, and massage during the first four days of postoperative recuperation in the acute care setting. The instruments used were as follows: a demographic data tool, used to gather data about the characteristics of the sample population; the short form of the Miller Behavioral Style Scale (MBSS) (Miller, 1987), to determine subjects' information coping style; a tailored teaching pamphlet and corresponding videotape designed for this study using the best practice protocols on music, self-guided imagery, and massage, used to instruct subjects in the use of the best practice protocols on music, self-guided imagery, and massage; three forms of a *Non-Drug Complementary Pain Interventions Survey (NDCPI)* – Forms A, B, and C, designed for, and piloted in, this study to assess subjects' knowledge, attitudes, and behaviors related to the best practice protocols on music, self-guided imagery, and massage before and after the teaching intervention; the *Use of Non-Drug Complementary Pain Interventions Form (UNDCPI)*, also designed for and piloted in this study, to measure subjects' use of music, self-guided imagery, and massage during their first four days of postoperative recuperation in the hospital and to measure subjects' level of satisfaction with the non-drug measures they chose for their individualized pain management plan; and the Pain Management Chart Audit

Instrument, an adapted form of Ferrell's 1999 *Standard of Care Audit Instrument.* Portions of the Chart Audit Instrument were used to monitor the extent to which the subject's in-patient chart contained documentation about the non-drug measures and pain-related consultants subjects used during their participation in the study. In addition, A Study Protocol Assurance Checklist was designed for this study as an aspect of the Data and Safety Monitoring Board Guidelines and was used to assure adherence to study protocols and consistency in the order of data collection. This chapter presents the analysis and findings of the data, first describing the characteristics of the study sample followed by descriptions and summaries of the analyses performed on the data and organized by research question.

Sample Characteristics

Demographic data including age, gender, race, marital status, educational level, information coping style, and use of non-drug measures during the month preceding surgery were collected from each subject at the time of their accrual into the study. At the same time, data were collected on subjects' use and pattern of regular exercise prior to surgery. Data on forty-six (46) subjects were used in the analysis of sample characteristics. Table 5 provides frequencies and descriptive statistics on the demographic variables of age, gender, race, marital status, information coping style, and educational level of study subjects.

Within the sample, there were 15 males (32.6%) and 31 females (67.4%). Subject ages ranged from 52 to 88 with a mean of 70 years (SD = 10.77). Forty-five subjects (97.8%) were white, non-Hispanic, and one subject (2.2%) was black, non-

Hispanic. Twenty-one subjects (45.7%) were married, 4 subjects (8.7%) were single, 7 subjects (15.2%) were divorced, and 14 subjects (30.4%) were widowed.

Table 5.
Characteristics of Sample Patients undergoing Knee or Hip Total Joint Replacement Surgery (N = 46)

	Frequency (n)	Percent (%)	Mean	Standard Deviation
Information Coping Style				
Monitors	40	87.0		
Blunters	6	13.0		
Total		**100.0**		
Age in Years			70.39	10.77
50 – 59	9	19.6		
60 – 69	10	21.8		
70 – 79	15	32.6		
80 – 89	12	26.0		
Total		**100.0**		
Gender				
Male	15	32.6		
Female	31	67.4		
Total		**100.0**		
Race				
White, non-Hispanic	45	97.8		
Black, non-Hispanic	1	2.2		
Total		**100.0**		
Marital Status				
Married	21	45.7		
Single	4	8.7		
Divorced	7	15.2		
Widowed	14	30.4		
Total		**100.0**		
Education			3.17†	1.23
< High school diploma	4	8.7		
High School Diploma or GED	11	23.9		
Some College	12	26.1		
College Graduate	11	23.9		
Graduate School	8	17.4		
Total		**100.0**		

† Scale score for education: 1 = < HS diploma, 2 = HS diploma, 3 = some college, 4 = college graduate, 5 = graduate school

The mean educational level of the sample was 3.17 (SD = 1.23) indicating that the average subject had some educational experience at the college level. Frequencies

on education showed that 4 subjects (8.7%) has less than a high school diploma, 11 subjects (23.9%) had a high school diploma or a General Education Diploma, 12 subjects (26.1%) had some college, 11 subjects (23.9%) had a college degree, and 8 subjects (17.4%) had attended graduate school. Within the sample, 40 subjects (87%) had a scored information coping style labeled 'monitor', and 6 subjects (13%) had a scored information coping style labeled 'blunter'. Twenty-four subjects (52.2%) reported they participated in regular exercise and 22 subjects (47.8%) reported they did not exercise regularly. Of the 24 subjects who reported regular exercise, twelve subjects (50%) reported exercising daily, 6 subjects (25%) reported exercising every other day, and 6 subjects (25%) reported exercising twice a week.

At the time of accrual into the study, subjects were also asked to provide information on their use of non-drug pain management methods during the month preceding their surgery. Items related to prior use were scored on a scale of 0 to 4 containing the following dimensions: 0 = no use, 1 = seldom, 2 = occasionally, 3 = frequently, or 4 = very frequently. Table 6 presents frequencies and means relative to the use of several non-drug complementary interventions during the month before surgery. The two measures whose combined subject response frequencies (occasional, frequent, or very frequent use) were highest were prayer/meditation (n = 27 [58.8%]), and music (n = 25 [54.4%]). Other non-drug measures whose combined subject responses were high along those same three dimensions (i.e. occasional, frequent, or very frequent use) were heat or cold (n = 23 [50%]), and massage (n = 10 [21.6%]).

Table 6.
Frequencies on Prior Use of Non-drug Measures During Month Preceding Surgery (N=46)

	Frequency (n)	Percent (%)	Mean	SD
Scale score for prior use: 0 = no use, 1 = seldom, 2 = occasional, 3 = frequently, 4 = very frequently				
Prayer or meditation			1.89	1.65
No use	17	37.0		
Seldom	1	2.2		
Occasionally	9	19.6		
Frequently	9	19.5		
Very Frequently	10	21.7		
Total		100.0		
Music			1.78	1.62
No use	17	37.0		
Seldom	4	8.7		
Occasionally	7	15.2		
Frequently	8	17.4		
Very Frequently	10	21.7		
Total		100.0		
Heat or Cold			1.41	1.31
No use	17	37.0		
Seldom	6	13.0		
Occasionally	13	28.3		
Frequently	7	15.2		
Very Frequently	3	6.5		
Total		100.0		
Massage			0.63	1.14
No use	33	71.7		
Seldom	3	6.5		
Occasionally	6	13.0		
Frequently	2	4.4		
Very Frequently	2	4.4		
Total		100.0		
Self-help education			0.57	1.13
No use	36	78.3		
Seldom	0	0.0		
Occasionally	5	10.8		
Frequently	4	8.7		
Very Frequently	1	2.2		
Total		100.0		
Herbs			0.46	1.13
No use	38	82.6		
Seldom	2	4.3		
Occasionally	2	4.4		
Frequently	1	2.2		
Very Frequently	3	6.5		
Total		100.0		

Table 6. (Continued)

	Frequency (n)	Percent (%)	Mean	SD
Scale score for prior use: 0 = no use, 1 = seldom, 2 = occasional, 3 = frequently, 4 = very frequently				
Acupressure			0.26	0.80
No use	41	89.1		
Seldom	0	0.0		
Occasionally	4	8.7		
Frequently	0	0.0		
Very Frequently	1	2.2		
Total		100.0		
Aromatherapy			0.26	0.71
No use	40	86.9		
Seldom	1	2.2		
Occasionally	4	8.7		
Frequently	1	2.2		
Very Frequently	0	0.0		
Total		100.0		
Acupuncture			0.22	0.66
No use	41	89.1		
Seldom	1	2.2		
Occasionally	3	6.5		
Frequently	1	2.2		
Very Frequently	0	0.0		
Total		100.0		
Yoga			0.22	0.66
No use	41	89.1		
Seldom	1	2.2		
Occasionally	3	6.5		
Frequently	1	2.2		
Very Frequently	0	0.0		
Total		100.0		
Reiki or Therapeutic Touch			0.13	0.54
No use	43	93.4		
Seldom	1	2.2		
Occasionally	1	2.2		
Frequently	1	2.2		
Very Frequently	0	0.0		
Total		100.0		

Usefulness Findings

Thirty-five cases in the sample contained complete pre-intervention *(Non-Drug Complementary Pain Intervention Survey – Form A)* and post-intervention data *(Non-Drug Complementary Pain Intervention Survey – Form C)* and were used in

the analysis of subject knowledge and attitudes about the use of best practice protocols on music, self-guided imagery, and massage.

Research Question One and Hypothesis One

Research question one focuses on determining if there was a change in subjects' knowledge about the purposes and benefits of music, massage, and self-guided imagery for pain management following use of the tailored teaching intervention. Null hypothesis one states that there will be no change in subjects' knowledge about the purposes and benefits of using music, massage, and self-guided imagery for pain management after using the tailored teaching intervention.

Changes in subject knowledge.

To examine changes in subject responses on knowledge items on the NDCPI (Forms A and C) before and after teaching, two statistical methods were used: frequencies/descriptives, and paired sample *t* tests. Table 7 (Appendix T) presents frequencies, means, and standard deviations for pre-intervention and post-intervention subject responses on knowledge items in the NDCPI – Form A and NDCPI – Form C, respectively.

Secondly, a paired samples *t* test was performed to compare the mean scores for total knowledge before and after teaching, and to compare each pair of knowledge items in the NDCPI (Forms A and C). Table 8 presents the results of the 17 pairs of items that underwent paired samples *t* testing, including the pre-intervention mean score, post-intervention mean score, changes in mean scores, and significance level (*p* value) of the changes for each pair. Test results demonstrated that twelve of the seventeen pairs of items analyzed showed subjects' knowledge

responses on the purposes and benefits of non-drug measures for pain management significantly increased ($p < .05$) after teaching (NDCPI – Form C).

Table 8.
Paired samples *t* test results of knowledge items on the NDCPI before (pre-admission testing day [Form A]) and after (post-operative day 3 [Form C]) teaching

Question for Pair (n)	N	Form A mean score	Form C mean score	Difference (C-A)	*P* value
Pair 1. The main reason for listening to music is to increase the effects of pain medicine.	36	3.000	3.750	.750	.002
Pair 2. Slow stroke massage helps me relax most when my pain level is really bad.	37	2.324	2.135	-.189	.198
Pair 3. Listening to music alone without pain medicines does not help relieve my pain.	36	3.250	3.278	.028	.899
Pair 4. Listening to soothing music is supposed to increase the helpful effects of pain medicines.	36	3.528	4.083	.555	.000
Pair 5. The purpose of massage is to stop me from thinking about my pain.	37	2.784	2.270	-.514	.005
Pair 6. Listening to soothing music allows me to take a more active role in dealing with my pain.	36	3.639	4.056	.417	.005
Pair 7. The most common reason music is not used more for pain relief is a lack of desire to try it.	36	3.583	3.722	.139	.281
Pair 8. The main benefits of massage are to lessen pain and improve rest.	36	3.778	4.028	.250	.048
Pair 9. Non-drug measures work best to relieve severe pain.	36	3.583	3.778	.195	.242
Pair 10. Using imagery can help a person feel less anxious.	35	3.543	4.000	.457	.001
Pair 11. The best time to use imagery is just after I take a pain medicine.	35	2.743	2.371	-.372	.005
Pair 12. Before using music or imagery, I must be sure to choose a quiet place and get in a comfortable position.	35	3.571	3.971	.400	.009
Pair 13. There are no special times when music will work best to help get a better effect from pain medicines.	35	2.886	3.086	.200	.281
Pair 14. People get the most benefit from non-drug methods when their pain is mild to moderate.	35	3.657	3.971	.314	.032
Pair 15. The use of imagery can improve the effect of pain medicines.	35	3.514	3.771	.257	.048
Pair 16. There are no good reasons for using non-drug measures along with pain medicines.	35	3.514	4.086	.572	.004
Pair 17. Music is most helpful when a person wants to ease the tension and anxiety that often go along with pain.	35	3.886	4.200	.314	.006

Thirdly, total knowledge scores calculated earlier were used in a paired samples *t* test to compare the mean pre-intervention knowledge score (NDCPI – Form A) to the mean post-intervention knowledge score (NDCPI – Form C). The mean knowledge score on the pre-intervention survey (NDCPI – Form A) was 57.49 (*SD* = 7.24) and the mean knowledge score on the post-intervention survey was 61.06 (SD = 4.39). For this sample, there was a significant difference in pre-intervention and post-intervention means (t (34) = 2.95, $p < .05$), suggesting subjects' knowledge about the purposes and benefits of non-drug methods was greater after the teaching intervention than before the teaching intervention.

Finally, subscale scores created earlier for music, self-guided imagery, and massage were analyzed using a paired samples *t* test to determine whether or not there were any changes in subjects' knowledge about the specific non-drug methods of music, self-guided imagery, or massage before and after teaching. In addition, the subscale scores for general knowledge about non-drug methods before and after teaching was included in the paired samples *t* test noted above to determine if there were any changes in subjects' general knowledge following use of the tailored teaching intervention about the overall purposes and benefits of non-drug methods for pain management. Details about the items from Forms A and C of the NDCPI used to create each of the subscales were presented in Chapter 3 of this study. Table 9 presents a summary of the knowledge subscale findings. The mean score for the pre-intervention knowledge subscale on music was 16.9 (SD = 2.32), and the mean score for the post-intervention knowledge subscale on music was 26.0 (SD = 2.16). Results of the *t* test analysis showed there was a significant change in subjects'

knowledge (t (35) = 17.2, $p <$. 001) about the purposes and benefits of using music as a non-drug method for pain management after teaching.

Table 9.
Comparison of means for knowledge subscales on music, self-guided imagery, and massage before and after teaching

Subscale Pair	N	Form A mean scores	Form C mean scores	Differences (C-A)	*p* value
Pair 1. Subscales on Music	35	16.971	26.029	9.058	.000
Pair 2. Subscales on massage	36	10.611	11.583	.972	.001
Pair 3. Subscales on self-guided imagery	35	13.886	15.371	1.485	.000
Pair 4. Subscales on general knowledge	35	9.229	8.086	-1.143	.193

In a similar manner, knowledge subscale means for self-guided imagery and massage were compared using paired sample *t* tests. The mean score for the pre-intervention knowledge subscale on massage was 10.6 (SD = 1.69) and the mean score for the post-intervention knowledge subscale on massage was 11.58 (SD = 1.48). For this sample, the results of the *t* test analysis specific to knowledge scores regarding massage showed there was a significant difference in the pre-intervention and post-intervention means (t (36) = 3.51, $p < .001$), suggesting subjects' knowledge about the purposes and benefits of massage for pain management increased following the teaching intervention. The mean score for the pre-intervention knowledge subscale on self-guided imagery was 13.0 (SD = 1.69) and the mean score for the post-intervention knowledge subscale on self-guided imagery was 15.4 (SD = 1.85). The change in mean knowledge scores specific to the use of self-guided imagery as a non-drug pain management method were also shown to be

significant (t (35) = 4.70, p < .001), suggesting subjects knew more about the purposes and benefits of self-guided imagery as a non-drug pain intervention after using the tailored teaching intervention.

In addition to these three subscales, the means of the items labeled as 'general knowledge' were calculated and analyzed. The mean score for the subscale on pre-intervention general knowledge about the purposes and benefits of non-drug methods for pain management was 9.23 (SD = 5.46) and the mean score for the post-intervention general knowledge subscale was 8.09 (SD = 1.44). While there was no statistically significant finding, (t (35) = 1.33, p > .05), the change in the mean scores suggests subjects did have more general knowledge about the purposes and benefits of using non-drug complementary interventions form pain management following use of the tailored teaching intervention. In light of the evidence, null hypothesis one is rejected.

Research Question Two and Hypothesis Two

Research question two sought to determine if there was any relationship between subjects' knowledge about the purposes and benefits of music, self-guided imagery, and massage and the demographic variables of age, gender, educational level, prior use of non-drug measures, and information coping style before and after the tailored teaching intervention. Null hypothesis two posits that there is no significant relationship between subjects' knowledge about the purposes and benefits of music, self-guided imagery, and massage for pain management and the demographic variables of age, gender, educational level, prior use of non-drug

methods, and information coping style before or after the tailored teaching intervention.

Knowledge and demographics relationships.

A bivariate analysis was performed using the pre-intervention and post-intervention total knowledge scores (NDCPI – Forms A & C) and the demographic variables of age, educational level (ed), and prior use of non-drug methods (prioruse). Table 10 presents the results of this analysis.

Table 10.
Bivariate analysis of total knowledge about non-drug methods against age, educational level, information coping style, total prior use of all non-drug measures, and prior use of only music, self-guided imagery, and massage.

	Age In years	Edu	Know Form A	Know Form C	Total prior use	Prior use	ICS
Age in years							
Spearman rho	1.00						
N							
Education (Edu)	-.152						
Spearman rho	.312	1.00					
N	46						
Know (Form A)	.178	-.224					
Spearman rho	.241	.138	1.00				
N	45	45					
Know (Form C)	.104	.262	.154				
Spearman rho	.553	.129	.377	1.00			
N	35	35	35				
Total prior use	-.065	.315*	.032	.066			
Spearman rho	.667	.033	.835	.707	1.00		
N	46	46	45	35			
Prior use	-.158	.348*	.050	.071	.849**		
Spearman rho	.293	.018	.743	.686	.000	1.00	
N	46	46	45	35	46		
Information coping style (ICS)	-.404**	.150	-.214	.028	-.073	.047	
Spearman rho	.005	.321	.158	.873	.629	.756	1.00
N	46	46	45	35	46	46	

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2 tailed).

The data in Table 10 demonstrates that several relationships were found but that only four of them were significant. Educational level and information coping style were each found to be important indicators of total prior use of all non-drug methods for pain relief before the intervention (.315, [N = 46], (*rho* <0.05) and prior use of music, self-guided imagery, and massage specifically. Similarly, total prior use of all non-drug methods was found to be a very strong indicator (.849, [N = 46], *rho* <0.01) of specific prior use of music, self-guided imagery, and massage as methods of pain management before the intervention. The analysis maintained confidence intervals of 95% and found several inverse, insignificant relationships related to age, suggesting age was not a good indicator of many of the demographic variables. The results of the analysis showed that inverse relationships were found between (a) educational level and knowledge about the purposes and benefits of non-drug methods for pain relief before the teaching intervention (-.224), suggesting one's educational level was not indicative of what subjects' knew about non-drug methods, (b) information coping style and knowledge about the purposes and benefits of non-drug methods for pain relief before the teaching intervention (-.214), suggesting one's information coping style was not associated with what subjects' knew about non-drug methods, and (c) information coping style and total prior use of all non-drug methods for pain management (-.073), suggesting there was no relationship between information coping style and subject-reported types or frequency of use of non-drug methods during the month prior to surgery.

A simple comparison of means for race and gender against knowledge about the purposes and benefits of non-drug methods for pain management before and

after teaching was also calculated to determine if there were changes in the mean knowledge scores before and after teaching by race and gender. The mean knowledge score for white, non-Hispanic subjects prior to teaching was 2.207 ([N = 29] SD = .819). There was a single black, non-Hispanic subject whose knowledge score prior to teaching was 3.00 (N = 1). There were no subjects of other races in the sample. The mean knowledge score for white, non-Hispanic subjects following the teaching intervention was 2.565 ([N =23], SD = .693). The improved mean knowledge score suggests Caucasian, non-Hispanic subjects benefited from using the tailored teaching intervention, as evidenced by a higher mean score after teaching. There was no knowledge score for the single black, non-Hispanic subject following teaching. The mean knowledge score for females prior to teaching was 2.233 ([N = 30], SD = .817), and the mean knowledge score for females after teaching was 2.565 ([N = 23], SD = .590). The mean knowledge score for males before teaching was 1.400 ([N = 15], SD = .632) and the mean knowledge score for males after teaching was 2.417 ([N = 12], SD = .793), suggesting the teaching intervention was beneficial for improving knowledge in both genders.

In addition to the simple comparison of mean knowledge scores before and after teaching, a bivariate analysis was conducted to determine if there were any significant relationships between gender and knowledge about the purposes and benefits of using non-drug methods for pain management. Table 11 summarizes the findings of that analysis. Both Pearson's correlation coefficient and the Spearman's *rho* demonstrate a statistically significant positive relationship ($p < .01$, $rho < .01$) between gender and pre-intervention knowledge about the purposes and benefits of

using music, self-guided imagery, and massage as non-drug methods for pain management.

Table 11.
Relationships between gender and knowledge before (NDCPI - Form A) and after (NDCPI - Form C) teaching

		Gender	Form A	Form C
Gender	Pearson correlation	1		
	Sig.			
	N			
	Spearman's rho			
	Sig.	1.00		
	N			
Form A	Pearson correlation	.466**	1	
	Sig.	.001		
	N	46		
	Spearman's rho	.467**		
	Sig.	.001	1.00	
	N	45		
Form C	Pearson correlation	.109	.109	1
	Sig.	.534	.534	
	N	35	35	
	Spearman's rho	.069	.154	
	Sig.	.695	.377	1.00
	N	35	35	

** Correlation is significant at the 0.01 level (2-tailed)

The results of data analysis suggest there *are* relationships between knowledge before and after teaching and the demographic variables of age, gender, educational level, information coping style, and prior use of non-drug methods for pain management. Statistically significant relationships were found between subjects' educational level and subjects' prior use of all non-drug methods, subjects' educational level and their specific use of music, self-guided imagery, and massage prior to surgery, and subjects' gender and their pre-intervention knowledge about the purposes and benefits of non-drug methods for pain management.

A moderately strong inverse relationship was also found between subjects' age and their information coping style, again suggesting age is not a good indicator of information coping style. In light of the evidence, null hypothesis two is not supported.

Research Question Three and Hypothesis Three

Research question three focuses on determining if there was a change in subjects' attitudes about using music, massage, and self-guided imagery for pain management following use of the tailored teaching intervention. Null hypothesis three states that there will be no change in subjects' attitudes about using music, massage, and self-guided imagery for pain management after using the tailored teaching intervention as measured by their responses on the attitude items in the NDCPI.

Changes in subject attitudes.

To examine changes in subject responses on attitude items on the NDCPI (Forms A and C) before and after teaching, two statistical analyses were conducted: frequencies and descriptives, and paired sample *t* tests. Table 12 (Appendix U) presents frequencies, means, and standard deviations for pre-intervention and post-intervention subject responses on attitude items in the NDCPI – Form A and NDCPI – Form C, respectively. The results showed an increased frequency of positive responses on the post-intervention survey, suggesting the teaching intervention influenced subjects' attitudes about using non-drug methods for pain relief.

In the same manner as with knowledge items, a paired samples *t* test was used to compare the means for each attitude item in the NDCPI (Forms A and C). Table 13 presents the results of the 13 pairs of items that underwent paired samples *t* testing analysis, including the pre-intervention mean score, post-intervention mean score, changes in mean scores, and significance level (*p* value) of the changes for each pair of items. Test results showed that for twelve of the thirteen items, subjects had a significant positive change ($p < .05$) in their attitudes about using non-drug methods for pain management after the teaching intervention.

Table 13.
Paired sample *t* test results of attitude items on the NDCPI before (Form A) and after (Form C) teaching showing mean scores, changes in means, and significance of changes in attitude scores

Question for Pair (n)	N	Form A mean score	Form C mean score	Difference (C-A)	*P* value
Pair 1. Nursing care should include the best of non-drug practices.	35	3.943	4.257	.314	.009
Pair 2. Listening to soothing music may be an important tool for helping treat pain after surgery.	35	3.800	4.171	.371	.001
Pair 3. Usual medical practice could benefit from using non-drug methods like music, imagery, and massage.	35	3.657	4.114	-.457	.000
Pair 4. I believe massage can reduce my stress.	35	4.000	4.229	.229	.058
Pair 5. I don't believe guided imagery has any true effect on the treatment of pain.	35	3.171	3.743	.572	.006
Pair 6. Nurses should be able to tell their patients about using music and imagery to be more relaxed.	35	4.000	4.343	.343	.016
Pair 7. Using imagery may be a helpful tool in treating pain after surgery.	35	3.686	4.029	.343	.038
Pair 8. I plan to continue listening to soothing music to relax me after I go home from the hospital.	35	3.714	4.257	.543	.001

Question for Pair (n)	N	Form A mean score	Form C mean score	Difference (C-A)	*P* value
Pair 9. I believe a mix of music, imagery, and massage will help me change the way I cope with pain in the future.	34	3.677	4.059	.382	.030
Pair 10. I believe listening to soothing music helps with the treatment of pain.	35	3.771	4.171	.400	.001
Pair 11. Knowing about non-drug pain methods is important to me as a patient.	36	3.917	4.222	.305	.006
Pair 12. I plan to use imagery to help deal with my pain when I go home from the hospital.	36	3.361	3.694	.333	.044
Pair 13. Teaching booklets given to patients before surgery should explain how to use non-drug methods for pain relief.	36	3.917	4.306	.389	.001

Thirdly, total attitude scores were calculated for the NDCPI – Form A and NDCPI – Form C in order to compare the means of subject responses on attitude items before teaching (Form A) and after teaching (Form C). Using these total attitude scores, a simple comparison of means was calculated to compare the mean pre-intervention attitude score (NDCPI – Form A) to the mean post-intervention attitude score (NDCPI – Form C). The mean score on the pre-intervention attitude survey (NDCPI – Form A) was 48.06 (SD = 4.19) and the mean score on the post-intervention attitude survey (NDCPI – Form C) was 52.10 (SD = 6.23).

Finally, attitude subscale scores for music, self-guided imagery, and massage were analyzed to determine whether or not there were significant changes in subjects' attitudes specific the use of these three non-drug methods before and after teaching. A subscale score for general knowledge items was also used and contained

items targeting general attitudes about the use of non-drug methods in medicine or nursing practice. Details about the items from Forms A and C of the NDCPI used to create attitude subscales were presented in Chapter 3 of this study. Using these subscales, a paired samples *t* test was calculated to compare the mean attitude scores for each of the subscales in music, self-guided imagery, and massage before and after teaching. . Table 14 presents a summary of these findings

The mean score for the pre-intervention attitude subscale on music was 11.26 (SD = 1.44), and the mean score for the post-intervention attitude subscale on music was 12.59 (SD = 1.73). This finding was statistically significant (t (35) = 4.40, $p <$. 001) suggesting subjects' attitudes about using music as a non-drug method for pain relief were significantly more positive after using the teaching intervention.

Table 14.
Comparisons of mean scores on attitude subscales for music, self-guided imagery, and massage before teaching (pre-admission testing day [NDCPI – Form A]) and after teaching (post-operative day 3 [NDCPI – Form C])

Subscale Pair	N	Form A mean scores	Form C mean scores	Differences (C-A)	*p* value
Pair 1. Subscales on Music	34	11.265	12.588	1.323	.000
Pair 2. Subscales on massage	35	4.000	4.229	.229	.001
Pair 3. Subscales on self-guided imagery	35	3.171	3.743	.572	.006
Pair 4. Subscales on general knowledge	34	23.059	25.294	2.235	.000

In a similar manner, attitude subscale mean scores on self-guided imagery and massage were compared using paired sample *t* tests. The mean score for the pre-intervention attitude subscale on massage was 4.00 (SD = .686) and the mean score

for the post-intervention attitude subscale on massage was 4.23 (SD = .598). For this sample, the results of the *t* test analysis specific to attitudes scores regarding the use of massage as a non-drug pain management method closely approached statistical significance (t (34 = 1.96, p = .058), suggesting subjects' attitudes about massage for pain management were slightly more positive following the teaching intervention. The mean score for the pre-intervention attitude subscale on self-guided imagery was 3.17 (SD = .747) and the mean score for the post-intervention attitude subscale on self-guided imagery was 3.74 (SD = .780). The change in mean attitude subscale scores specific to the use of self-guided imagery as a non-drug pain management method were statistically significance (t (34) = 2.95, $p < .01$), suggesting subjects' attitudes about using self-guided imagery as a non-drug pain intervention were more positive after using the tailored teaching intervention. In addition to these three subscales, the mean scores of the items labeled as 'general attitudes' were calculated and analyzed. The mean score on the on pre-intervention general attitudes subscale about using non-drug methods for pain management was 23.06 (SD = 1.91) and the mean score on the post-intervention general attitudes subscale was 25.29 (SD = 3.13). This finding was also statistically significant (t (34) = 2.95, $p < .05$), suggesting subjects' general attitudes about the use of non-drug methods in medical and nursing practice were more positive following use of the tailored teaching intervention. The evidence supports rejection of null hypothesis three.

Research Question Four and Hypothesis Four

Research question four sought to determine if there was any relationship between subjects' attitudes about using music, self-guided imagery, and massage for

pain management and the demographic variables of age, gender, educational level, prior use of non-drug measures, and information coping style before and after the tailored teaching intervention. Null hypothesis four states there is no significant relationship between subjects' attitudes about using music, self-guided imagery, and massage for pain management and the demographic variables of age, gender, educational level, prior use of non-drug methods, and information coping style before and after the tailored teaching intervention.

Attitudes and demographics relationships.

A bivariate analysis was performed using the pre-intervention and post-intervention total attitude scores (NDCPI – Forms A & C) and the demographic variables of age, educational level (ed), and prior use of non-drug methods (prioruse). Table 15 presents the results of this analysis

The data demonstrates that several positive relationships were found but only five of them were statistically significant. Educational level was found to be a statistically significant indicator of total prior use of all non-drug methods for pain relief (*rho* < .05) and prior use specific to music, self-guided imagery, and massage (*rho* < .05). Total prior use of all non-drug methods was found to be a statistically significant indicator (*rho* <0.01) of specific prior use of music, self-guided imagery, and massage as methods of pain management. Age was found to be a statistically significant indicator of subjects' information coping style (*rho* < .01), and there was a perfect correlation (*rho* = 1.000) between subjects' attitudes before teaching (Attitudes Form A) and subjects' information coping style. The analysis (alpha = 0.05, 2-tailed) found several inverse, statistically insignificant relationships related

to age, to include age vs. education (-.152), age vs. pre-intervention attitudes (-.295), age vs. post-intervention attitudes (-.304), age vs. total prior use of all non-drug methods (-.065), age vs. specific use of music, self-guided imagery, and massage (-.158). The results of the analysis also showed that inverse relationships were found between educational level and attitudes about using music, massage, and self-guided imagery for pain management before the teaching intervention (-.068), and information coping style and prior use of all non-drug methods before the teaching intervention (-.073).

Table 15.
Bivariate analysis of total attitudes about using music, self-guided imagery, and massage against age, educational level, information coping style, and prior use of music, self-guided imagery, and massage.

	Age In years	Edu	Att Form A	Att Form C	Total prior use	Prior use	ICS	
Age in years								
Spearman rho	1.00							
N								
Education (Edu)								
Spearman rho	-.152	1.00						
N	.312							
	46							
Attitudes (Form A)								
Spearman rho	-.295	-.068	1.00					
N	.052	.663						
	44	44						
Attitudes (Form C)								
Spearman rho	-.304	.214	.227	1.00				
N	.080	.225	.203					
	34	34	33					
Total prior use								
Spearman rho	-.065	.315*	.173	.246	1.00			
N	.667	.033	.262	.161				
	46	46	44	34				
Prior use								
Spearman rho	-.158	.348*	.167	.286	.849**	1.00		
N	.293	.018	.280	.102	.000			
	46	46	44	34	46			
Information coping								
style (ICS)	-.404**	.150	.000	.180	-.073	.047		
Spearman rho	.005	.321	1.000	.307	.629	.756	1.00	
N	46	46	44	34	46	46		

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2 tailed).

A simple comparison of means between race, gender, and attitudes about using music, self-guided imagery, and massage as non-drug methods for pain management before and after teaching was also calculated to determine if there were changes in the mean attitude scores before and after teaching by race and gender. The mean attitude score for white, non-Hispanic subjects prior to teaching was 1.964 ([N = 28] SD = .693). There was a single black, non-Hispanic subject whose attitude score prior to teaching was 3.00 (N = 1). There were no subjects of other races in the sample. The mean attitude score for white, non-Hispanic subjects following the teaching intervention was 2.238 ([N =21] SD = .831). There was no attitude score for the single black, non-Hispanic subject following teaching. The mean attitude score for females prior to the teaching intervention was 2.000 ([N = 29] SD = .707), and the mean attitude score for females after the teaching intervention was 2.238 ((N = 21) SD = .831). The mean attitude score for males before the teaching intervention was 2.000 ([N = 15] SD = .756) and the mean attitude score for males after the teaching intervention was 2.615 ([N = 13] SD = .506), suggesting an overall positive change in subjects' attitudes about using music, self-guided imagery, and massage for pain management after the teaching intervention.

In addition to the simple comparison of mean attitude scores before and after teaching, a bivariate analysis was conducted to determine if there were any significant relationships between gender and attitudes about using music, self-guided imagery, and massage as non-drug methods for pain management.

Table 16.
Bivariate correlations between gender and attitudes before (NDCPI - Form A) and after (NDCPI - Form C) teaching

		Gender	Form A attitudes	Form C attitudes
Gender	Pearson correlation	1		
	Sig.			
	N			
	Spearman's rho	1.00		
	Sig.			
	N			
Form A	Pearson correlation	.000	1	
	Sig.	1.000		
	N	44		
	Spearman's rho	.000	1.00	
	Sig.	1.000		
	N	44		
Form C	Pearson correlation	-.252	.224	1
	Sig.	.151	.211	
	N	34	33	
	Spearman's rho	-.215	.227	1.00
	Sig.	.222	.203	
	N	34	33	

Table 16 summarizes the findings of that analysis. Both Pearson's correlation coefficient and the Spearman's *rho* demonstrate no statistically significant relationships ($p > .05$, $rho > .05$) between gender and pre-intervention attitudes about using music, self-guided imagery, and massage as non-drug methods for pain management. The inverse relationship found between gender and subject attitudes after the teaching intervention was statistically insignificant and suggests that gender is not a good indicator of subjects' attitudes about using music, self-guided imagery, and massage as non-drug methods for pain management. In light of the evidence, hypothesis was rejected for the demographic variables of age, education, and total prior use, but supported for gender.

Research Question Five

Research question five asked to what extent subjects were able to demonstrate 'best practice' behaviors in using music and self-guided imagery after using the teaching intervention. Simple frequencies, mean scores, and standard deviations were calculated from NDCPI – Form C responses on behavior to determine the extent to which subjects perceived they could use best practice protocol behaviors while using music and/or self-guided imagery during their recuperation from surgery. Table 15 presents a summary of those findings. The data suggests that subjects did perceive that they could use best practice protocol behaviors for all but two elements that they may not have been able to control while using music and self-guided imagery during their in-hospital recuperation from surgery.

Table 17.
Frequencies: use of best practice behaviors following teaching

Question (n)	Frequency (n)	Percent (%)	Mean	SD
31. Did you select music that was soothing to you?			4.02	1.09
1: None of the time	2	5.9		
2: Less than ½ of the time	0	0.0		
3: Half of the time	5	14.7		
4: More than ½ of the time	9	26.5		
5: All of the time	18	52.9		
Total	34	100.00		
32. Did you control the lighting in the room when listening to soothing music and/or imagery?			2.68	1.34
1: None of the time	7	20.6		
2: Less than ½ of the time	12	35.3		
3: Half of the time	6	17.6		
4: More than ½ of the time	3	8.8		
5:All of the time	6	17.6		
Total	34	100.00		
33. Did you find a quiet place to use music and/or imagery?			2.33	1.33
1: None of the time	11	33.3		
2: Less than ½ of the time	10	30.3		
3: Half of the time	6	18.2		
4: More than ½ of the time	2	6.1		
5: All of the time	4	12.1		
Total	33	100.0		

Question (n)	Frequency (n)	Percent (%)	Mean	SD
34. Did you get into a relaxed position when using music and/or imagery?			4.03	0.94
1: None of the time	1	2.9		
2: Less than ½ of the time	1	2.9		
3: Half of the time	5	14.7		
4: More than ½ of the time	16	47.1		
5: All of the time	11	2.4		
Total	34	100.0		
35. Did you breath deeply and evenly when using music and/or imagery?			3.79	0.91
1: None of the time	1	2.9		
2: Less than ½ of the time	2	5.9		
3: Half of the time	6	17.6		
4: More than ½ of the time	19	55.9		
5: All of the time	6	17.6		
Total	34	100.0		
36. Did you keep your eyes closed while using music and/or imagery?			4.00	1.07
1: None of the time	2	5.9		
2: Less than ½ of the time	1	2.9		
3: Half of the time	4	11.8		
4: More than ½ of the time	15	44.1		
5: All of the time	12	35.3		
Total	34	100.00		
37. Did you travel in your mind to a pleasant scene while using imagery?			3.94	1.32
1: None of the time	4	12.5		
2: Less than ½ of the time	1	3.1		
3: Half of the time	1	3.1		
4: More than ½ of the time	13	40.6		
5: All of the time	13	40.6		
Total	32	100.00		
38. Did you keep your mind empty of distracting thoughts while using imagery?			3.69	1.26
1: None of the time	4	12.5		
2: Less than ½ of the time	1	3.1		
3: Half of the time	4	12.5		
4: More than ½ of the time	15	46.9		
5: All of the time	8	25.0		
Total	32	100.00		

Research Question Six and Hypothesis Five

Research question six sought to determine if there was a relationship between subjects' ability to demonstrate best practice behaviors for music, self-guided imagery, and massage and subjects' age, gender, marital status, educational level,

prior use of non-drug methods, and information coping style after using the teaching intervention. Null hypothesis five states that there will be no significant relationship between subjects' ability to perform best practice behaviors in using music, self-guided imagery, and massage and subjects' age, gender, educational level, prior use of non-drug methods, and information coping style after using the tailored teaching intervention as measured by subjects' responses to behavior items on the NDCPI – Form C.

Behavior and demographics relationships.

A bivariate analysis was performed to determine the strength of the relationship between subjects' scores on the behavior items from the NDCPI – Form C and their prior use of music, self-guided imagery, and massage before the teaching intervention. Table 18 presents a summary of that analysis. Based on confidence intervals of 95% (two-tailed), the data demonstrate only one statistically significant inverse relationship (-.404, [N = 46], *rho* < .01) involving information coping style and post-teaching behaviors related to the use of music, self-guided imagery, and massage as non-drug pain management methods. This finding suggests that information coping style may be an indicator of subjects' perceived abilities to perform best practice behaviors for music and self-guided imagery after participating in the teaching intervention. More discussion about this is included in Chapter 5. There was also a statistically significant relationship between the use of all types of non-drug methods during the month prior to surgery, and use specific to music, self-guided imagery, and massage during the month prior to surgery (.849 [N = 46], *rho* < .01) suggesting subjects' use of any type of non-drug measure for pain

management prior to surgery was strongly related to their use of music, self-guided imagery, and massage during the month prior to surgery. Several other relationships were found but none were statistically significant and none were specifically related to post-intervention use of best practice behaviors on music and/or self-guided imagery.

Table 18.
Bivariate analysis between total behaviors related to using non-drug methods after teaching and total use of non-drug methods prior to surgery, specific use of music, self-guided imagery, and massage prior to surgery, and demographic variables of age, education, marital status, race, and information coping style.

	Age In years	Edu	Marital status	Race	Beh Form C	Total prior use	Prior use	ICS
Age in years	1.00							
Spearman rho	.							
N	46							
Education (Edu)	-.152	1.00						
Spearman rho	.312	.						
N	46	46						
Marital Status	.351*	-.219	1.00					
Spearman rho	.017	.144	.					
N	46	46	46					
Race	.079	-.242	.192	1.00				
Spearman rho	.603	.105	.200	.				
N	46	46	46	46				
Behav. (Form C)	-.096	.232	-.063	.	1.00			
Spearman rho	.606	.210	.735	.	.			
N	31	31.	31	31	31			
Total prior use	-.065	.315*	-.023	.068	.251	1.00		
Spearman rho	.667	.033	.878	.655	.174	.		
N	46	46	46	46	31	46		
Prior use	-.158	.348*	.064	.176	.258	.849**	1.00	
Spearman rho	.293	.018	.675	.242	.162	.000	.	
N	46	29	46	46	31	46	46	
Information coping style (ICS)	-.404**	.150	-.232	-.058	.433**	-.073	.047	1.00
Spearman rho	.005	.321	.121	.703	.015	.629	.756	.
N	46	46	46	46	31	46	46	46

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2 tailed).

In addition, a simple comparison of the mean score for use of all types of non-drug methods during the month prior to surgery and subjects' mean score for all behavior items in the NDCPI – Form C was calculated. The mean score for total prior use was 8.26 (SD = 6.51), and the mean score for post-intervention behaviors was 28.6 (SD = .639). The worst possible total prior use score was 0.0 representing no use of any non-drug methods during the month prior to surgery. The best possible total prior use score was 48.00, representing very frequent use of all 12 non-drug methods included on the pre-intervention demographic data form. Subject scores on the total prior use scale ranged from 0.0 to 26.0. The mean total prior use score of 8.26 suggests that during the month prior to their surgery most subjects had not used many of the non-drug methods about which they were questioned. The maximum possible score for the post-intervention survey regarding best practice behaviors employed during the use of music, self-guided imagery, and massage was 40.0. The mean post-intervention behavior score of 28.6 suggests that approximately 71.6% of the time subjects used the best practice behaviors when they used music, self-guided imagery, or massage during their acute care post-operative recuperation.

A paired samples *t* test was also calculated using total prior use scores and total post-intervention behavior scores to determine if there was a relationship between prior use of non-drug methods and subjects' abilities to use the best practice behaviors following the teaching intervention. No relationship was found (t (31) = 5.11, $p < .001$), leaving open the possibility that the teaching intervention may be responsible for subjects' actual use of music, self-guided imagery, and massage while they recovered from knee or hip joint replacement surgery.

The final analysis was an examination of the mean scores for post-intervention behaviors to determine if there was any relationship between best practice behaviors after teaching and gender. The total behavior score was recoded into a new variable for ease of comparison where 1 = mean behavior scores from 8 through 24, 2 = mean behavior scores from 25 through 30, and 3 = mean behavior scores from 32 through 40. The mean behavior score for males was 2.36 ([N = 11], SD = .674) and the mean behavior score for females was 2.00 ([N = 20], SD = .718). The results suggest that males were more inclined to use best practice behaviors for pain management after surgery. To further determine if there was a relationship between gender and post-intervention behaviors regarding the use of music and self-guided imagery, a bivariate analysis using gender and recoded post-intervention behavior scores was calculated. There was no significant relationship between gender and post-intervention behaviors related to the use of music or imagery as non-drug methods for pain management ([N = 31], -.197, p = .251, *rho* = .289). In light of the evidence, hypothesis five was accepted with regard to all of the demographic variables except information coping style, where a significant relationship was found.

Research Question Seven

Research question seven sought to determine if there was a relationship between subjects' *prior* use of music, self-guided imagery, and massage and subjects' *actual* use of these three non-drug pain management methods during subjects' acute care hospitalization. In the absence of similar work in the nursing

literature, and as a pilot study for a novel mode of patient teaching and postoperative pain management, no hypothesis was established for this research question.

A bivariate comparison of means between total use of music, self-guided imagery, and massage during the month prior to surgery and subjects' total use of music, self-guided imagery, and massage by day of postoperative acute care was calculated to determine the strength of any relationships that might exist. Table 19 provides a summary of that analysis, including Spearman correlation coefficients.

Table 19.
Bivariate correlations between subjects' prior use of music, self-guided imagery, and massage, and actual use by day of postoperative recuperation.

	Use-DOS	Use PO1	Use PO2	Use PO3	Prior use
Total use – Day of surgery	1.00				
Spearman rho	.				
N	36				
Total use – POD #1	.443**	1.00			
Spearman rho	.009	.			
N	34	37			
Total use – POD #2	.432**	.831**	1.00		
Spearman rho	.015	.000	.		
N	31	32	35		
Total use –POD #3	.436*	.571**	.694**	1.00	
Spearman rho	.023	.002	.000	.	
N	27	26	27	31	
Prior use	.533**	.159	.120	.043	1.00
Spearman rho	.001	.346	.493	.818	.
N	36	37	35	31	31

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The data show several statistically significant relationships between subjects' use of music, self-guided imagery, and massage by hospital day following surgery. More importantly, the data show a statistically significant relationship (.533, [N = 36], *rho* < .01) between prior use of music, self-guided imagery, and massage and actual use

of music, self-guided imagery, and massage on the day of surgery, suggesting prior use of music, self-guided imagery, and massage is a good indicator of actual use of these three non-drug methods for pain relief on the day of surgery.

Research Question Eight and Hypothesis Six

Research question eight sought to determine if there was a change in use of music, self-guided imagery, and massage over the four days of the subjects' recuperation from surgery, to include the day of surgery, postoperative day 1, postoperative day 2, and postoperative day 3. Null hypothesis six states that there will be no change in subjects' use of music, self-guided imagery, and massage over the four days of the subjects' acute care hospital stay.

Usefulness Findings.

Two statistical analyses were performed on the data regarding subject use of the music, self-guided imagery, and massage during the first four days of their postoperative recuperation.

First, frequencies and means were calculated for questions 1, 3, 5, and 6 of the *Use of Non-Drug Complementary Interventions Form (UNDCPI)* for the day of surgery, and postoperative days 1, 2, and 3. Table 20 provides a summary of these results to include frequencies, means, and standard deviations for each UNDCPI question by day of postoperative recuperation. The data suggests subjects used music, self-guided imagery, and massage with increasing frequency over the four days of postoperative convalescence.

Table 20.
Frequencies and descriptive statistics for subjects' use of music, self-guided imagery, and massage for day of surgery and days 1, 2, and 3 of postoperative recuperation.

	Frequency (n)	Mean	SD
Q1. How many times during the past 24 hours have you used music to help relieve your pain? *			
Day of surgery	38	1.63	1.22
Post op day 1	40	2.55	1.63
Post op day 2	40	3.08	1.53
Post op day 3	37	3.08	1.67
Q3. How many times during the past 24 hours have you used imagery to help relieve your pain?			
Day of surgery	38	1.34	.994
Post op day 1	40	1.78	1.42
Post op day 2	39	1.92	1.46
Post op day 3	36	2.14	1.78
Q5. How many times did you use music and imagery together over the past 24 hours?			
Day of surgery	37	1.35	1.01
Post op day 1	39	1.77	1.42
Post op day 2	36	1.94	1.53
Post op day 3	32	2.03	1.67
Q6. How many times did you request a massage over the past 24 hours?			
Day of surgery	37	1.38	.545
Post op day 1	38	1.63	.714
Post op day 2	40	1.73	.751
Post op day 3	36	1.61	.803

Use Rubric: 1 = none, 2 = one, 3 = two, 4 = three, 5 = four, 6 = five or more [times]

Secondly, a simple description of the mean use of music, self-guided imagery, and massage for each day of acute care was calculated to determine if there was a change in use as the subject progressed in their postoperative recuperation. Table 21 presents a summary of the means and standard deviations for use of music, self-guided imagery, and massage by day of postoperative recovery. The data shows that there was a 27.4% increase in the mean score related to the use of music, self-guided imagery, and massage on the first postoperative day over the day of surgery mean score, an 11.2% increase in the mean score regarding use on postoperative day two

over postoperative day one, and a 4.4% increase in the mean use score on postoperative day three over postoperative day two. The increasing means seems to confirm that subjects used music, self-guided imagery, and massage more as non-drug method for pain management as they continued to recover from their surgery.

Table 21.
Mean scores for use of music, self-guided imagery, and massage from items 1, 3, 5, & 6 of the UNDCPI for the day of surgery and days 1, 2, and 3 following surgery.

	N	Mean	Standard Deviation
Total use – Day of surgery	36	5.750	3.25
Total use – POD 1	37	7.919	4.32
Total use – POD 2	35	8.914	4.09
Total use – POD 3	31	9.323	4.70

The data offers evidence to reject null hypothesis six.

Research Question Nine

The study's final research question, number nine, ask how satisfied subjects are during their first three days after knee or hip joint replacement surgery with the non-drug pain interventions they have selected as part of their overall pain management plan. A simple frequency for question 9 on the UNDCPI form was calculated by day of postoperative care and is summarized in Table 22. The data shows that subjects became increasingly satisfied with the choices of non-drug methods they made as their hospital stay progressed.

Table 22.
Frequency of response regarding subject satisfaction with non-drug methods they selected as part of their overall pain management plan.

Question 9 (Frequencies)	DOS	PO1	PO2	PO3
How satisfied are you with the non-drug methods you chose?				
Very dissatisfied	1	0	0	0
Dissatisfied	0	1	2	1
Neither satisfied nor Dissatisfied	16	11	6	5
Satisfied	13	19	20	16
Very satisfied	5	7	11	15
N	35	38	39	37
Mean	3.63	3.84	4.03	4.22
Standard Deviation	.770	.754	.811	.787

Additional finding

One additional finding was that nearly all subjects read the entire pamphlet and rated the ease of readability as 5 out of 5, indicating they felt it was very easy to read. Fleish-Kinkaid Readability Scores indicated the pamphlets had a Fleish reading ease of 62.4%, a reading grade level of 7.2, and only 10% passive sentences.

Chapter 5

Discussion

This research was a sub-study of the parent study title "Translating Best Practice in Non-Drug Pain Management" (Dufault & Tracy, 2005). The main purpose of this sub-study was to empirically test a tailored teaching intervention on the use of non-drug pain methods of music, self-guided imagery, and massage for pain management in postoperative adults recovering from knee or hip total joint replacement surgery. In the parent study, a seven-step "translating research into practice" model (Collaborative Research Utilization [CRU] Model) was used to generate and evaluate 3 "best practice" protocols used by a nurse-led, evidence-based, complementary (non-drug) pain management service in an urban community hospital. The primary purpose of this pilot was to describe the usefulness to patients of a tailored teaching intervention on these best practice protocols for music, self-guided imagery, and massage as developed in the parent study. Specifically, the pilot study sought to determine (a) if there were changes in subjects' knowledge and attitudes about using music, self-guided imagery, and massage for pain management following implementation of the teaching intervention, (b) the extent to which subjects believed they demonstrated best practice behaviors in using music, self-guided imagery, and massage following teaching, and (c) the extent to which subjects actually used the non-drug methods as part of their pain management plan after surgery.

Discussion of the results for the small population studied offers insights into the types of additional research that both could and should be done in larger,

randomized, controlled studies in the future. The CRU was an *essential* component of the research and should not be overlooked as the critical framework that upheld the substance of the project and within which study results were obtained. Thoughts on future research will be incorporated into each of the discussion sections that follow.

Characteristics of the population.

The study population was a single-group convenience sample of 46 adults 50 years or older that was scheduled for knee or hip total joint replacement surgery. The average age of subjects was 70 years, and the population was generally well educated, with more than 65% of the subjects having at least some college education. Most subjects were either married or widowed, and the population studied was nearly homogeneous for Caucasian race. Slightly more than half of the subjects were women, and the majority of the population was classified as 'monitors' based on their scored responses to the MBSS (short form).

The characteristics of the study sample may not be indicative of the general population owing to the fact that the study was conducted in a New England, ocean-side community where older residents are typically more affluent individuals whose educational levels and race are more consistent with the data obtained but potentially different from the general population. Future controlled studies with this teaching intervention should be conducted in additional geographic locations where populations are more heterogeneous in terms of race, economic level, and gender in order to determine the usefulness of the teaching intervention for people of all ethnicities, economic situations, and genders.

Several other findings are worth noting related to the population characteristics and the application of the teaching intervention. There were significant relationships between age and information coping style, and education and prior use of non-drug measures before surgery. The first finding suggests that age is a good indicator of information coping style, though studies with larger populations will offer further information to confirm or refute this finding. The finding concerning relationships between information coping style and demographic variables has not been reported in the nursing literature before, but has implications for the delivery of information to adults 50 and older. Since the majority of subjects were labeled 'monitor' and the mean age of the population was 70 years, this finding also suggests that as subjects get older, they may seek more, rather than less, information regarding health matters. While this makes logical sense, the finding may help dispel myths that older people are not as interested in learning about their health or in taking responsibility for their health. The finding also suggests that the concept of information coping style may have a great deal of utility in tailoring information for similarly-aged adults to their preferred mode of receiving information.

The finding on education and prior use for this sample suggests that individuals who have experienced more formal learning may be more inclined to seek out (and use) information about non-drug measures for pain relief. Additional research with larger populations containing a more equal distribution of subjects over the various educational levels is warranted and could produce a more comprehensive view of the strength of any relationship between education and prior use of non-drug methods for pain management.

Changes in knowledge.

Analysis of the change scores for total knowledge before and after the teaching intervention demonstrates subjects in this sample had more overall knowledge about the purposes and benefits of music, massage, and self-guided imagery as non-drug methods for pain management after using the teaching intervention. In addition, analysis of the change scores for the subscales pertaining to specific knowledge on music, massage, and self-guided imagery demonstrates subjects had more knowledge about the purposes and benefits of using each of the specific non-drug interventions or music, self-guided imagery, and massage after using the tailored teaching intervention. Results of the paired samples *t* test showed that there was a statistically significant change in the mean scores comparing pre-intervention to post-intervention knowledge on 12 of the 17 paired items in the analysis. This finding appears to strongly suggest that the teaching intervention played a distinct role in changing subjects' overall knowledge about the purposes and benefits of using music, self-guided imagery, and massage as non-drug methods for pain management. In addition, a comparison of the means of specific knowledge subscale scores on music, self-guided imagery, and massage showed that there were statistically significant positive changes in subjects' post-intervention knowledge about each of the non-drug methods of music, self-guided imagery, and massage.

There were no significant relationships between knowledge and the demographic variables of age, education, total prior use of non-drug methods, specific use of music, self-guided imagery, or massage, and information coping style. There was an inverse, pre-intervention relationship between knowledge and

education suggesting that a subject's educational level was not a good indicator of what he or she actually knew about music, self-guided imagery, and massage *before* the teaching intervention. Post-intervention knowledge was positively correlated with education, though not statistically significant, suggesting the teaching intervention was at least somewhat influential in producing knowledge changes about the purposes and benefits of music, self-guided imagery, and massage for pain management in subjects of all educational levels. There was, however, a statistically significant relationship between gender and pre-intervention knowledge about music, self-guided imagery, and massage suggesting one's gender was a good indicator of what one might know about the purposes and benefits of these non-drug methods. This finding may be confounded by the fact that the population studied was more than 60% female, thereby skewing results toward the female gender. This finding does suggest that further research with larger, more gender-balanced populations is warranted to determine the true nature of any relationships between gender and knowledge related to the use of music, self-guided imagery, and massage as non-drug methods of pain management.

There was also an inverse relationship between knowledge and information coping style suggesting one's preferred style of receiving information may not have been a good indicator of what one actually knew about the pain management benefits of music, self-guided imagery, and massage *before* the teaching intervention. Post-intervention knowledge, however, demonstrated a positive relationship with information coping style, suggesting the type of booklet the subject received appropriately corresponded to the subjects' scored information coping

style. In addition, this finding suggests that information coping style may have played some role in the knowledge subjects gained from the multi-modal approach used to communicate the information about the best practice protocols contained in the teaching intervention. This finding is particularly interesting as nurses seek to develop consistent approaches to overcoming the ongoing problems of poor retention and inattentiveness that plague patient teaching. By delivering health information to patients using more than one mode, nurses make use of educational research suggesting most individuals learn through many modes, thereby allowing nurses to provide information will 'stick' and influence future patient behaviors.

Conversely, this finding may have been confounded by the fact that there were few subjects in the study whose MB scores fell into the 'blunting' category of information coping, thereby producing increases in knowledge scores primarily for individuals who would more naturally prefer more information (i.e. monitors). In addition, overall knowledge about the use of non-drug approaches to various health issues, including pain management, has been more widespread in the general media and in everyday life over the last 10 to 12 years, possibly influencing subjects' pre-intervention knowledge scores and accounting for the lack of significance in the post-intervention knowledge scores. Because of the abundance of information about non-drug methods as aids to treatment of health issues, individuals may be subtly barraged in multiple venues with non-drug information, whether they prefer to receive it or not. This practice may interfere with subjects' ability to enact their preferred information coping style and unwittingly influence pre-intervention knowledge scores. Each of these potentially confounding relationships should be

researched in larger populations in a controlled study where the strength of the relationships between information coping style and knowledge outcomes can be empirically tested with increased rigor.

Changes in Attitudes.

Statistical analysis of the data on changes in subjects' attitudes about the use of non-drug interventions for pain management demonstrated that subjects' attitudes about using music, self-guided imagery, and massage as complementary non-drug methods for pain management were more positive following use of the teaching intervention. Paired samples *t* test results comparing the mean attitude scores before the teaching intervention and the mean attitude scores following application of the teaching intervention showed a statistically significant improvement in subjects' attitudes in 12 of the 13 pairs compared. This finding suggests that the teaching intervention positively influenced subjects' attitudes about using non-drug methods for pain management. In addition, the mean scores for pre-intervention and post-intervention attitude subscales for music, self-guided imagery, and massage all showed a statistically significant positive change following the teaching intervention. The psychology literature tells us that attitudes are often tied to both knowledge and behavior. Changes in attitudes are often underpinned by changes in knowledge and manifested by changes in behavior. As a result, the findings about changes in attitudes are believed to amplify the findings on knowledge and will surface again under the discussion of subject behaviors in using music, self-guided imagery, and massage as non-drug methods for pain management.

There were no statistically significant relationships between subjects' attitudes and the demographic variables of age, gender, education, total prior use of non-drug measures before surgery, specific use of music, self-guided imagery, or massage before surgery, or information coping style. An inverse relationship was found between age and attitudes before teaching, suggesting age is not a good indicator of one's attitudes about using non-drug methods for pain management. A second inverse relationship between education and attitudes before teaching was also found and suggests that one's educational level is not a good indicator of one's attitudes about using music, self-guided imagery, and massage as non-drug methods for pain management. Finally, there was an inverse relationship between gender and post-intervention attitudes suggesting one's gender is not a good indicator of one's attitudes following teaching. Additional research is needed with larger populations in more controlled studies where there is a more equally distribution of subjects in terms age, education, and gender to more precisely determine the strength of any relationships between attitudes about using music, self-guided imagery, and massage as non-drug pain management methods and age, education, or gender.

Changes in Behaviors.

No pre-intervention scores for behavior related to the use of music, self-guided imagery, or massage was available owing to subjects' lack of practice prior to surgery. The pre-interventional form of the NDCPI (Form B) was created for use following the subjects' receipt of a teaching pamphlet and viewing the videotape on how to perform the breathing and relaxation techniques presented in the teaching pamphlet. Failure to obtain any worthwhile data on this form was a function of

subjects' not practicing the behaviors for using music, self-guided imagery, and massage as non-drug pain management methods during the week prior to their surgery. In retrospect, the behaviors sought in the study were not complex (i.e. relaxation breathing, positioning, and starting/adjusting a head-set) and likely did not have to be 'practiced' prior to surgery. As a result, only post-intervention was obtained. Results of the analysis of behavior scores on the NDCPI – Form C showed that subjects' felt their abilities to perform required behaviors for using music, self-guided imagery, and massage were good following surgery. Some of the behaviors sought were also found to be out of the subjects' control (i.e. control the lighting in the room, control the noise level), and therefore received a low scale score by subjects who responded to these items on the NDCPI – Form C. The inclusion of specifics in the teaching pamphlet on behaviors subjects' needed to use the non-drug methods appeared to be sufficient for subjects to be able to use music, self-guided imagery, and massage without difficulty following teaching.

A significant finding was obtained for the comparison of means for subjects' information coping style and subjects' behaviors in using music, self-guided imagery, and massage following teaching. This finding suggests one's information coping style is a good indicator of one's behaviors following teaching. This finding makes sense in that most subjects were classified as 'monitors' and would tend to prefer all the information they could get in order to perform the necessary behaviors for using these non-drug pain management methods after surgery. This finding also amplifies a previous finding related to the tailoring of the teaching pamphlet, and

suggests that the information in the pamphlets was most likely consistent with the subjects' scored information coping style.

While there was a positive relationship between prior use of all forms of non-drug methods for pain management and subject behaviors in using music, self-guided imagery, and massage following teaching, these results were not significant. This finding suggests that prior use of non-drug methods for pain relief positively influences how well subjects will perform the behaviors needed to use music, self-guided imagery, and massage following teaching. Again, additional controlled studies with larger populations would likely help flesh out any true relationships between prior use of non-drug methods and post-teaching subject behaviors related to the use of music, self-guided imagery, and massage.

Relationships between Prior Use and Actual Use.

Another issue of interest had to do with whether or not the subjects' *prior* use of non-drug methods was related in any way to subjects' *actual* use of music, self-guided imagery, and massage once they had undergone surgery. As a pilot study, no other works were available to determine if this issue had been previously investigated, making these results a benchmark for future research. Correlations between subjects' prior use of non-drug methods and their actual use over the day of surgery, and postoperative days one, two, and three showed there was a significant relationship between prior use and actual use only on the day of surgery. This is an unexpected finding since it was believed that subjects would be too sleepy from the surgery to want to use the non-drug interventions. The finding suggests two main things: (a) subjects relied on their past use of and experiential memories of using

non-drug methods to aid them in using music, self-guided imagery, and massage on the day of surgery, or (b) that the subjects felt motivated to actually use music, self-guided imagery, and massage on the day of surgery when they anticipated having a great deal of pain. Finally, the lack of significance for relationships between prior use and days one, two, and three of postoperative recovery suggests that prior use is not an indicator of subjects' continued use of music, self-guided imagery, and massage over the course of their acute care hospital stay.

Significant relationships were also found, however, between days one and two of postoperative recuperation, and days two and three of postoperative recovery. These findings suggest that subjects used the music, self-guided imagery, and massage more as their recuperation progressed. The increased usage strongly suggests subjects that as subjects found the use of music, self-guided imagery, and massage to be beneficial as a form of non-drug pain management, they were motivated to use it more. This type of finding supports the notion that beneficial outcomes, wherein subjects have more control over their pain management, tend to create a self-satisfying cycle of continuous use, thereby enhancing subjects' medical recovery and reaffirming their attitudes about using non-drug measures for pain management in the future. Confirmation of the use findings noted above came from subjects' responses that they were increasingly satisfied with the non-drug methods they chose over the four days of acute hospital care. The mean for satisfaction increased from 3.63 on the day of surgery to 4.22 on the third postoperative day, suggesting more subjects rated their choices as very satisfying. Again, the increased use suggests subjects found the interventions valuable in managing their

postoperative pain. This increased use contributed to the increasing satisfaction subjects attained through the use of music, self-guided imagery, and massage during their hospital stay, again creating a cycle of continuous improvement.

Finally, the climate of receptivity to research that characterizes the organization in which the study was conducted cannot be overstated. A critical element in the conduct and translation of research using the CRU is administrative support for research and an attitude of scientific inquiry. Such attitudes transcend the routinization of care and empower nurses to substantively advance practice through the discovery, validation, and integration of new practices that improve patient care. Without an organization that invites innovation, this study would not have been able to explore and reveal the nature of practices related to non-drug enhancements for pain management. Without organizational and nursing administrators that empower nurses and communicate the value of research, advances in practice, such as those obtained in this study, would be exceedingly difficult.

Limitations

Pilot work often comes replete with many limitations, and this work is no exception. Despite every earnest effort, several limitations emerged as the research progressed. First, the survey instruments require additional work to ensure internal and external consistency prior to their use. Efforts to obtain internal consistency during this pilot have not yet been analyzed, but bear careful consideration and analysis in the coming months. Instruments designed for this study also need refinement and addition empirical testing in order to demonstrate the true nature of inter-rater reliability, construct validity, and content validity. Instrument

development projects should be undertaken to ensure that piloted instruments could withstand rigorous critique and obtain valid data. Survey work might also include a Delphi study of experts in perioperative teaching and complementary pain interventions to determine the verifiability of the best practice protocols in a larger nursing practice arena and to obtain new information about other critical elements pertaining to preoperative teaching about non-drug pain management interventions that may be needed in teaching materials. Initial experiences with survey data collection indicate many subjects found the surveys too long, so a reduction in the number of items is necessary to distill the data to those items that are most meaningful.

A second limitation was the sample size. Certainly larger samples would be necessary to affirm or refute any of the findings presented in this work. No data were collected on individuals who declined participation, so it is uncertain as to whether or not there was any cohort or selection bias during subject accrual. Further, not all subjects answered all questions on survey instruments. No analysis of non-response bias was conducted, so it is uncertain whether or not the characteristics of non-responders differ from characteristics of responders. Future studies would attempt to follow-up on each of these limitations through the use of statistical analyses and further examination of study protocol guidelines.

A third limitation was the uncertainty as to whether or not the teaching pamphlets were actually tailored to the subject's MBSS score. Finding no evidence of such work in the literatures searched for this dissertation, the researcher could not ensure that the pamphlets were truly consistent with the subject's information coping

style. Despite findings that suggest the pamphlets were appropriately constructed to coincide with subjects' information coping style, a great deal of work remains to be done to generate and pilot additional teaching pamphlets that help define and validate the credibility of the tailoring feature of patient teaching materials.

Lastly, while several significant relationships were found in this pilot study, the smallness of the sample size calls into question the true meaning of the results. The purpose of the pilot was to determine if changes would occur in knowledge, attitudes, and behaviors following a tailored teaching intervention, and, despite the small sample size, the pilot accomplished its purpose. Findings of significance in this pilot strongly suggest that results were not just due to chance, but show that demonstrable changes in subjects' knowledge, attitudes, and performance abilities regarding music, self-guided imagery, and massage occurred and can be attributed to the tailored teaching intervention. While this pilot work is promising, only after randomized, controlled trials are conducted with larger populations, using lessons learned from this pilot, will researchers be able to gain perspective on the true meaning of this pilot's results. Further longitudinal nursing research on tailoring patient teaching materials is needed to study the validity, reliability, and consistency associated with tailored teaching interventions.

Recommendations

Recommendations for additional research using the CRU and this tailored teaching intervention have been incorporated into the discussion section of this work. The pilot nature of this work also raised many questions about whether or not such protocols for care could be integrated into the everyday practice of nurses on a

busy acute care unit. Nurse managers and researchers alike were concerned about the time it would take for nurses to carry out their responsibilities related to the interventions. Training issues surfaced so that, in the end, all staff working on every shift were ultimately educated about the project and trained in the collection of data on the 'use' forms. Nurses reported the range of times necessary to collect information on the UNDCIP forms to be 2 minutes to 10 minutes, with a mean of 6 minutes. Time for subjects and nurses to complete data collection (NDCPI – Form C, brief pain index, and UNDCPI – POD3) ranged from 5 minutes to 40 minutes, with a mean of 21 minutes. Since the subject was responsible for completing Form C of the survey, it is estimated that nursing time was no more than 5 to 6 minutes for data collection on the day of discharge from acute care. These times demonstrate that nurses' participation in the research took only 12 to 15 minutes, on average, and likely did not interfere with their assigned patient care responsibilities. It is recommended that future studies incorporate the training of all nurses on the unit in the protocols for using the intervention to inspire a team approach and to enhance the effectiveness of the intervention for all patients.

Lastly, work still needs to be done in using the CRU to develop and translate other nursing care interventions into everyday practice. Replicative work on tailoring other patient teaching and health information issues is needed and could provide a lifetime of ongoing research. It is often said that good research generates more questions than it answers. Humbly, this is one such work.

Conclusions

The issue of pain management cannot afford to ignore the benefits of complementary non-drug interventions. Postoperative pain management continues to be problematic in hospitals across the country and warrants continued attention and the use of combinatory measures in order to ensure patients have sufficient pain relief. This study has empirically suggested that the use of tailored teaching interventions on non-drug measures change patient's knowledge, attitudes, and behaviors about using complementary methods to aid in management of their pain. When tailored to the patient's information coping style teaching interventions such as this may have the power to transform the patient's role in pain management from one of passive recipient-of-care to one of active participant-in-care and regulator of their own care. This idea needs to be tested further in a multi-institutional randomized controlled trial.

As the usefulness of the intervention was analyzed, valuable insights into subjects' knowledge, attitudes, and behaviors associated with pain-relieving benefits of using music, self-guided imagery, and massage have surfaced. In addition, insights regarding subjects' opinions about the complexity and ease of use of the teaching intervention have been obtained. Subjects continued use of music, self-guided imagery, and massage demonstrates the ease of use of the intervention and the desire patients have to play a part in managing their own pain by trying novel interventions that have the potential to help them relieve their postoperative pain. Insights obtained from this pilot research will be used at the study hospital to modify the intervention and further tailor its implementation. Those modifications can help

foster the translation of research regarding tailored teaching on best practice protocols on music, massage, and self-guided imagery into the daily practices of staff nurses caring for surgical patients.

Characteristics of study hospital, such as the demographics of the populations it serves, their commitment to improving pain management care, and their proactive nursing department, all contributed substantially to an internal environment conducive to the development and use of a complementary pain service as an outcome of the parent study, as well as the pilot sub-study. Translating the results of empirically supportable pain management research requires that individuals, groups, and organizations be willing to embrace innovation and continue to support a mindset that fosters scientific inquiry. Lastly, a well-integrated information documentation system for cueing clinicians' pain management practice was in place and further strengthened the potential for changing patient teaching practice at this hospital. Selection of sites for future studies should include an examination of such features so as to provide comparable environments for study and facilitate adoption and integration of novel approaches to pain management.

This research supports the goals and ideals of Healthy People 2030 by offering patients more autonomy in deciding how and when to manage their pain and by educating them to be responsible for their own health. Future tailored teaching interventions will likely work best if underpinned by the Collaborative Research Utilization Model developed by Dufault (1995). The CRU provides the connection between research faculty, students, and members of the nursing community that creates the synergy for change so essential to advancing practice. The model holds

great promise for the future of translation research and empowers nurse scientists to make a true difference in the lives of the patients to whom they deliver care.

Appendix A

Best Practice for Using Music

Procedure	Empirical Evidence
Assess pt's ability to communicate appropriately.	Pt. must be alert and able to communicate (Fratianne, et. al., 2000).
Assess baseline pain level.	Baseline measurement of pain level may be done for comparative purposes later (Kwekkeboom, 2003).
Provide instruction/education related music use and pain perception.	Pain is a multifaceted phenomenon composed of physiologic, psychosocial, cultural, and subjective components (Heiser, et. al., 1997). The multidimensional qualities of music allow it to touch physical, psychological, social, and spiritual levels of consciousness (Beck, 1991). Attending to a pleasant source of distraction occupies the information processing capacity of humans such that the individual is not capable of fully attending to the noxious stimuli. Less attention to the painful stimuli results in less perceived pain (Kwekkeboom, 2003). Music is a source of distraction, reducing pain by alternative thoughts, emotions, moods, and by inducing relaxation (Kwekkeboom, 2003).
After listening to 30 seconds of each type of music, patient self-selects music that is soothing for them.	Pts are given the choice of synthesizer, harp, piano, orchestral, or slow jazz (Good, et. al., 1999). In order for music to elicit a positive response, it must be perceived as pleasant or significant to the individual listener (McCaffrey & Locsin, 2002).
Eliminate physical and environmental sources of discomfort and distraction whenever possible.	Behavioral methods attempt to modify physiologic reactions to pain. Headphones serve to minimize distractions while filtering out noise from the surrounding environment (Sloman, 1995).
Use the following suggestions to help achieve the best effects possible from using music: * Maintaining a comfortable, relaxed position, * Before beginning, rate your pain between 0 and 10 (0 = none), * Take some cleansing breaths to help you relax. * Before turning on the music, apply the headphones and adjust for comfort.	Many patients find it helpful to have a procedure to follow when using music as a non-drug means of managing their pain (McCaffery & Pasero, 1999; Fratianne, et. al., 2001)).
* Turn on the music and listen to it at a comfortable volume. * Close your eyes and allow the music to 'wash' over you. Feel the rhythm of the music and (if you like) mark time to the music). * Listen to the music for up to an hour, * When the music session is finished, open your eyes, and rate your pain again.	Given the inexpensive, non-invasive, easily used nature of this intervention, it is recommended as an adjunct to normal care practices (Evans, 2002).
* Routinely provide music as a complement to pain medications.	

Appendix B

Best Practice for Using Massage

Procedure	Empirical Evidence
Slow stroke back massage (SSBM) is provided in the patient's own room with a curtain or door closed. A 'Do Not Disturb' sign is posted outside the door indicating a session is in progress.	In order to minimize distractions, provide privacy, and prevent interruptions (Ferrel-Torry & Glick, 1993).
Subjects were asked to keep conversation to a minimum or to refrain from it, unless it is completely necessary.	To assist in subjects' concentration on the massage instead of on the conversation (Ferrel-Torry & Glick, 1993).
Continuous 3 minute SSBM by Elizabeth (1966). Slow, gentle, rhythmic strokes delivered by the nurse with uniform speed and pressure, which is light but firm, at a rate of 60 strokes/minute. Massage initiated at crown of head to sacral area as appropriate.	Longworth (1982) found decreased anxiety and decreased muscle tension. In addition, no significant changes in HR or B/P. Researchers recommend that the procedure should not exceed 3 minutes because beyond that time the stroking will tend to stimulate rather than relax (Fakouri & Jones, 2000). Sims (1986) found decreased symptoms of distress, tension, and fatigue, and an increase in mood and concentration.
Three massages at least 24 hours apart depending on the individualized pain management protocol derived by the complementary team – nurse and subject.	Nurse administering massage determined the most appropriate time for the massage to occur, whether in the day or evening hours (Smith, 2002).
The use of lubricants to enhance massage.	Talcum powder was used (Fakouri & Jones, 1987) because it eliminates the possibility of vasoconstriction and muscle tension that could result from inadequate warming of a lotion. Grape seed oil was used (Dunn, et. al., 1995).

Appendix C

Best Practice for Guided Imagery

Procedure	Empirical Evidence
Assess imaging ability.	The capacity for imaginative involvement appears to be an important factor in determining potential for success with guided imagery (Kwekkeboom, et. al., 1998). Cognitive impairment and age strongly influence the amount of analgesic nurses administer (Feldt, Ryden, & Miles, 1998). ~~ Cognitively impaired patients may not anticipate when pain will be a problem (Feldt & Finch, 2002)
Begin to assess pts ability and willingness to participate in guided imagery for pain control.	Guided imagery should be discussed with the patient as early as when a surgical case is scheduled (Halpin, et. al., 2002). ~~ Pain documentation, including non-pharmacological treatments, needs to be improved for cognitively impaired and intact older adults (Feldt & Finch, 2002). ~~ Patients were interviewed daily with standardized pain assessments (Morrison, et al, 2003). ~~ Pain assessments should be conducted during movement with postoperative older patients (Feldt, Oh, 2000).
Discuss the advantages of guided imagery.	Relaxation, and diminished pain perception are main advantages of imagery as a non-drug complementary pain intervention (Godbey, et. al, 1997; VanFleet, 2000; Kwekkeboom, 2001). Advantages of imagery are: * Increased sense of control owing to techniques pts can initiate, *Decreased feelings of helplessness and hopelessness, * Provides a calming diversion from the experience of pain, *Breaks pain-anxiety-tension cycle (Sloman, 1995).
Assess and instruct pt about imagery prior to having surgery.	As much as a week before surgical procedure, ask pt. if they want to participate in guided imagery (Halpin, et. al., 2002).
Day of surgery, pt. asked to use imagery techniques three times a day (upon waking, after lunch, and at bedtime).	Staff nurses indicate that integrating imagery into daily practice care routines should not be a problem and could be accommodated. Staff also indicate that time issues for implementation of thrice daily imagery were anticipated to be short (Research roundtable with staff, 4/9/03).
Select format of imagery to be used.	Audio-taped imagery exercises augmented by a question and answer session that guide participants in becoming comfortable and developing pleasant images of nature scenes (i.e. walking along a river, sitting under a tree surrounded by wild flowers, viewing a sunset, etc.) (Kwekkeboom, 2001). ~~ Two methods of teaching were used in one study: audiotape and live instruction by the nurse. Both methods proved to be effective with little difference between them (Sloman, 1995).
Instruct patient to bring guided imagery tapes and headset on day of surgery.	Bring Walkman © with auto-reverse to play guided imagery tapes (Halpin, et. al., 2002).

Best Practices on Imagery

Provide tools and instructions for imagery to work as follows: * Provide a quiet environment (including taking the phone off the hook, 'Do not disturb' sign on the door), * Get comfortable (loosen clothing, empty your bladder, position of support and comfort), * Close your eyes, * Take some deep cleansing breaths before beginning, * Focus on breathing, * Silently repeat a word, sound, phrase or prayer to help you concentrate on relaxing, 1. Free the mind of invasive thoughts and distractions, 2. Use imagery technique for several minutes but no more than 20 minutes at a time, 3. Expect the results of each imagery session to vary.	Clear description of how to use imagery should be used to distract the patient from pain, to produce relaxation that diminishes the perception of pain, and/or to produce an image of pain relief that decreases the perceived intensity of pain (McCaffery & Beebe, 1989; Mobily, et. al., 1993). The more time the nurse has to individualize the imagery experience for the patient, the better the outcomes (McCaffery, & Beebe, 1989).
Keep the patient involved with the imagery process; have patient mentally travel to their imagery scene and describe the setting in detail.	Keeping patients purposefully involved in the use of their imagination to achieve relaxation and pain control is considered a critical element in the successful implementation of imagery activities (Mobily, et. al., 1993). Better benefit is achieved when patients are taught strategies prior to the operative procedure (Department of Defense, 2002).
Develop cleansing or clearing portion of imagery (i.e. pain appears as red dust and washes down stream in a creek as you enter).	Allows patient to envision the dissociation of pain from the body (Mobily, et. al., 1993).
Assist patient in developing method to end imagery session (i.e. counting to 10 while breathing with thoughts of feeling refreshed and alert).	Guides patient slowly back to reality (Mobily, et. al., 1993).
Follow-up with patient by assessing pt. use of imagery.	Active involvement of the patient during imagery can provide a sense of personal control over painful sensations and contribute to increased sense of relaxation (Mobily, et. al., 1993).

Nursing home staff would benefit from postoperative pain management education. (Feldt & Gunderson, 2002).

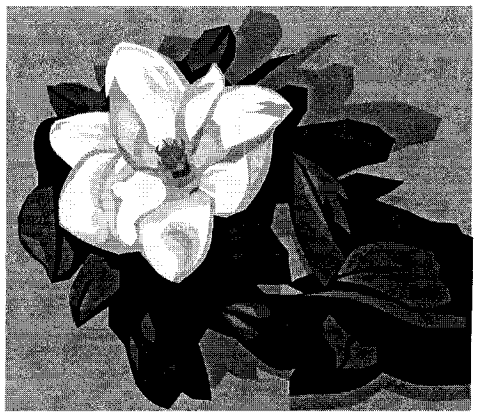
Appendix D

Using Music, Massage,

And Guided Imagery To

Help Manage Pain

after Surgery©



Soothing Music
And
Guided Imagery
to enhance your pain control

What is soothing music?

Soothing music is a complementary method for pain control. It does not replace medication, but may be used to enhance the effects of medication. Since ancient times, music has been shown to be useful in decreasing or lessening pain and the tensions that accompany pain. As part of our everyday world, music seems to have a special effect on us.

Feelings of pain are made up of physical, emotional, and cultural aspects. Music can reduce stress in many of these areas by providing distraction.

Music provides distraction by creating different thoughts, emotions, and moods that contribute to relaxation.

When is music most helpful in reducing pain?

1) When you rate your pain as mild to moderate (1to 7 on a 0 to 10 point pain scale).

2) When you are between doses of pain medicine, cannot have additional medicine for pain relief, but still have some lingering pain.

3) Upon waking, when you know that you will be participating in care-related events that may require extra energy, or that could temporarily increase your pain (such as getting out of bed, using special hospital equipment connected to your recovery, walking, physical therapy, during or after a dressing change, and so forth).

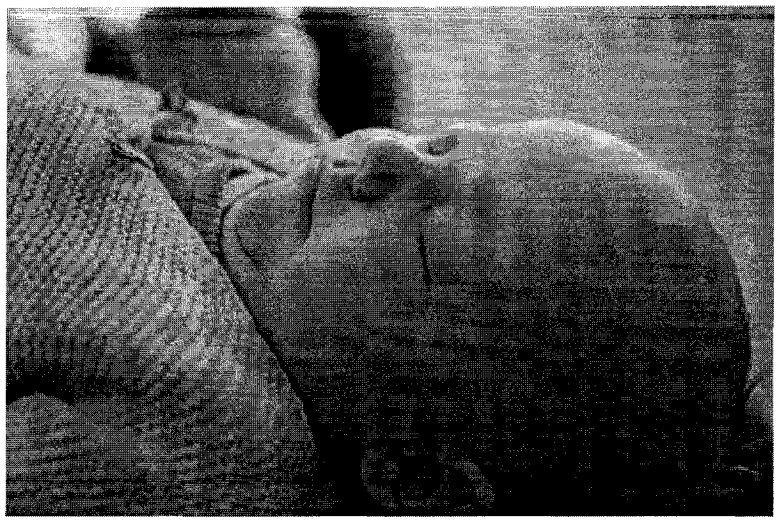
4) After participating in care related events that required extra energy and/or temporarily increased your pain as listed above.

What types of music can I listen to?

Before you begin using music, select the type of music you may enjoy the most. After listening to 30 seconds of each type of music, you can select the type that is soothing for you. Music choices include slow jazz, classical, synthesizer, harp, piano, or orchestral.

How long should I listen?

The best effects of music are usually obtained within an hour after beginning to listen to soothing music. Many people find that going beyond an hour of music listening does not improve their pain relief, but because the experience of listening to music is so soothing, they like to continue listening.



In fact, many people find they fall asleep after listening to soothing music for about an hour or less. Feel free to continue to listen as long as the music is comforting and soothing.

How should I listen to music?

The following suggestions can help achieve the best possible effects from using music to enhance pain relief.

1) Find and maintain a comfortable, relaxed position.

2) Before beginning, rate your pain between 0 and 10 (0 = none). If your pain is 7 or l ess, you may find music to be very helpful as an enhancement to your pain medicines.

3) Take 3 or 4 deep breaths to help you relax.

4) Before turning on music, apply the headphones for comfort. Using headphones will lessen background noise to get the best effect.

5). Turn on the music and listen to it at a comfortable volume.

6) Close your eyes and allow the music to "wash" over you. Feel the rhythm of the music (and, if you like, mark time to the music).

7) Listen to the music for up to an hour.

8) When the music session is finished, open your eyes and rate your pain once again.

Soothing music can elevate mood, reduce uneasiness and fear, diminish muscle tension, and increase relaxation.

What is guided imagery?

Guided imagery is another complementary method for pain control. Relaxation and diminished pain are the benefits of using guided imagery.

Guided imagery has been used for centuries. The healthcare settings are seeing this as a powerful tool for coping with and reducing stress.

Guided imagery is a mind-body activity. The intention of guided imagery is to promote peace and relaxation. Guided imagery relies on the power of the mind to bring in all of the 5 senses (sight, smell, sound, taste, touch).

Advantages that you'll likely experience when using guided imagery include:

1) Increased control of your pain.

2) Decreased feelings of helplessness and hopelessness.

3) Increased sense of calmness.

4) Decreased pain, anxiety, and tension.

When is guided imagery most helpful in reducing pain?

1) When you rate your pain as mild to moderate (that is, when your pain is 1 – 7 on a 0 – 10 point pain scale)

2) When you are between doses of pain medicine and still have some lingering pain.

3) When you will be participating in activities in which you will need extra energy or anticipate pain.

4) After you have participated in events that required extra energy or that increased your pain.

5) Mid-afternoon when you have time to rest and relax.

6) When you feel anxious, fearful, angry, overwhelmed, or stressed.

7) Shortly after your pain medication has had time to take effect and you want to relax (usually about 20 to 30 minutes after oral medications).

8) At bedtime to prepare for sleep.

What type of guided imagery is right for me?

Guided imagery can be done by using an audiotape, CD, videotape, or by live instruction.

The benefits of using an audiotape, CD, or videotape is that you can actively use guided imagery whenever you would like without the aid of another person.

Live instruction is not available at this time in this facility.

Guided imagery can have a cleansing portion to it. During the session, you may hear phrases like "pain appears as red dust that washes down a creek-bed as you enter". This allows you to visualize the separation of pain from the body. You can feel the pain as a separate entity and this will help you reduce your pain levels.

How do I participate in guided imagery?

1) Select a quiet environment.

2) Find and maintain a comfortable position (loose clothing and empty bladder).

3) Close your eyes.

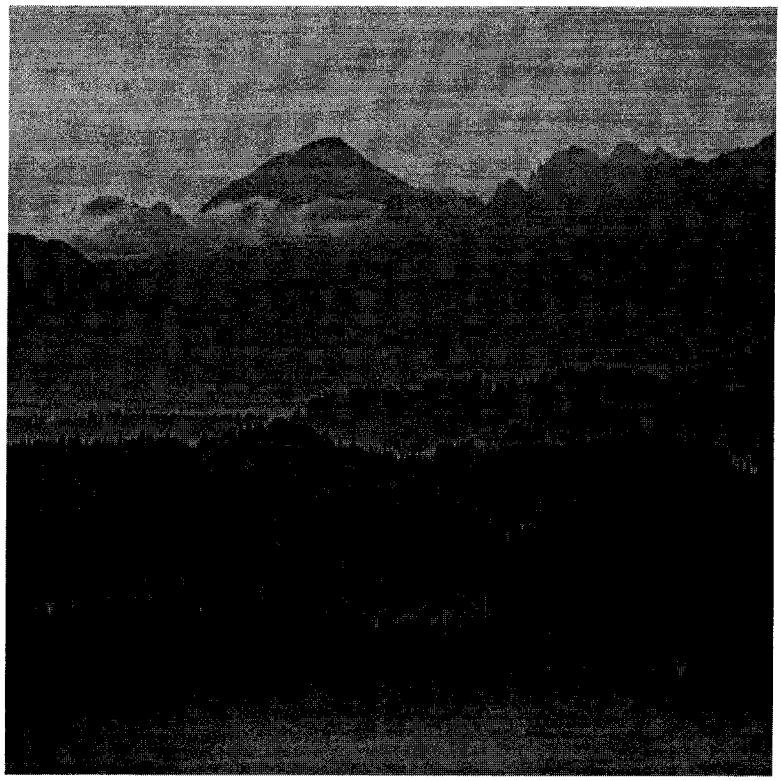
4) Take some deep breaths in and out before beginning. Imagine you are blowing out all the stress and pain.

5) Really focus on your breathing.

6) Silently repeat a word, sound, phrase, or prayer to help you concentrate on relaxing.

7) Free the mind of invasive thoughts and distractions.

8) Use this imagery technique for several minutes but no more than 20 minutes at a time.



The results of each imagery session may vary.

MASSAGE THERAPY

to enhance pain control

What is massage therapy?

Massage therapy is a complementary method for pain control. It does not replace medication, but may be used to enhance the effects of medicine.

Feelings of pain are made up of physical, emotional, and cultural aspects. Massage therapy can reduce the stress of many of these areas by providing distraction.

When is massage therapy most helpful in reducing pain?

1) When you rate your pain as mild to moderate (that is, 1-7 on a 0-10 point pain scale).

2) When you are between doses of pain medicine, cannot have additional medicine for pain relief, but still have some lingering pain.

3) Shortly after your pain medication has had time to take effect and you want to relax (usually about 20-30 minutes after oral medication).

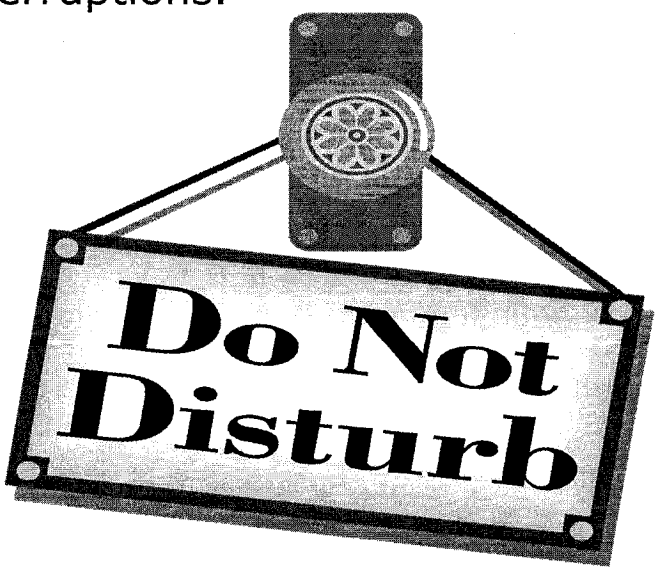
4) At bedtime when you want to prepare yourself for a good night's sleep.

5) You and your nurse can decide together about the time and set a schedule.

What should I expect with my massage therapy session?

1) Immediately before the massage is started, you will be asked to rate your pain on a scale of 0-10 points, with 0 being no pain and 10 being the worst pain you can imagine.

2) The room is then prepared for the massage by closing the curtain and the door. A "Do Not Disturb" sign will be placed on the door indicating a session is in progress. This is done to minimize distractions, provide privacy, and prevent interruptions.



3) The conversation level during the massage should be kept to a minimum to assist in greater levels of concentration on the massage itself.

4) The massage consists of slow, gentle, rhythmic strokes delivered by a nurse. The massage is done from the crown of the head to the sacral area and is done with uniform speed and light but firm pressure. The massage lasts 3 minutes at 60 strokes per minute.

5) Talcum powder will be used as lubricant. This eliminates the possibility of tightening blood vessels in the skin and avoids muscle tension that could result from inadequate warming of lotions.

6) The massages will be done at least 24 hours apart. You may receive a total of three (3) massages while you are getting better after your surgery on the hospital unit.

7) Immediately after the massage, you will again be asked to rate your pain using the 0-10 point pain scale.

Please use this pamphlet often while recovering from your surgery. Do not hesitate to ask your nurse for help whenever you have any questions about using music, imagery, or massage to enhance the effects of your pain medications.

We are interested in your comfort and hope that your use of these non-drug methods will help you feel more comfortable.

Please sign this page. Your nurse will collect it from you on the day of your surgery. Thank You.

I have read the teaching pamphlet on using music, guided imagery, and massage.

_____

Patient Signature

Subject ID#_____

Nurse's first initial & last name _____

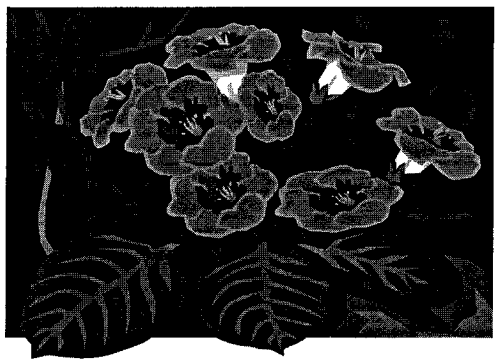
Appendix E

Using Music, Massage,

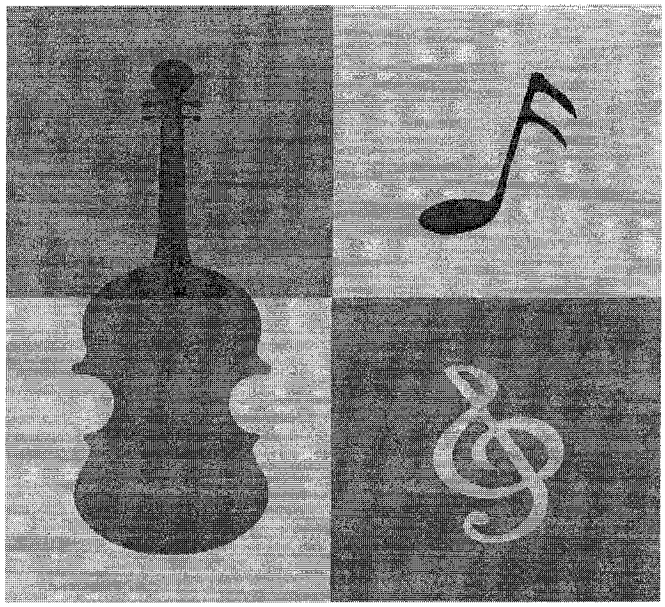
And Guided Imagery

To Help Manage

Pain after Surgery©



Soothing Music
And
Guided Imagery
to enhance your pain control



Why use music to help manage your pain?

As part of our everyday world, music seems to have a special effect on us, such as improving our mood and helping us relax. Music can be used along with your pain medicines to help you better manage your pain after your surgery.

Music provides distraction by creating different thoughts, emotions, and moods that contribute to relaxation.

Music is most helpful in reducing pain when:

1) You rate your pain between 1 and 7 on a 0 to 10 point pain scale.

2) You are between doses of pain medicine, and still have some lingering pain.

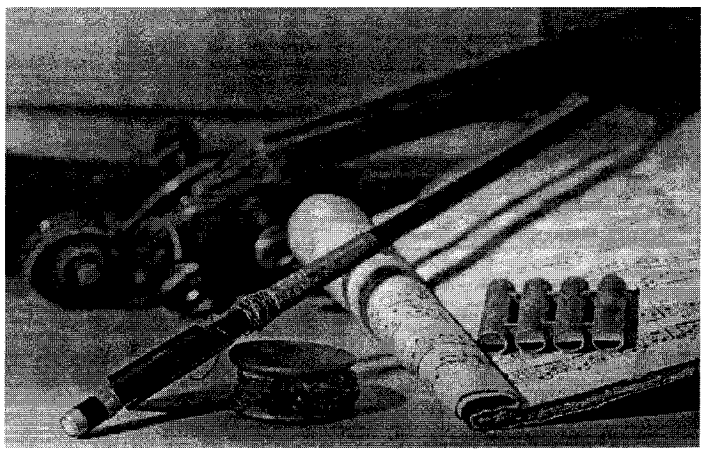
3) After you have participated in events that required extra energy or temporarily increased your pain.

4) Mid-afternoon when you have time to relax.

5) When you feel angry, fearful, anxious, overwhelmed, or stressed.

6) About 20 -30 minutes after taking oral pain medicine.

7) At bedtime when you want to prepare yourself for a good night's sleep.



What types of music can I listen to?

Before you begin using music, select the type of music you think is most soothing to you.

Music choices include slow jazz, classical, synthesizer, harp, piano, or orchestral. Listen to 30 seconds of the types available to help you decide.

How should I listen to music?

The following suggestions can help achieve the best effects possible from the use of music:

1) Find and maintain a comfortable, relaxed position.

2) Before beginning, rate your pain on a scale from 0-10 (0=no pain, 10 = severe pain).

3) Take in and blow out 3 to 5 deep breaths to help you relax.

4) Before turning on the music, apply head phones for comfort.

5) Turn on the music and listen to it at a comfortable volume.

6) Close your eyes and allow the music to "wash" over you. Feel the rhythm of the music.

7) Listen to the music for up to an hour.

8) When the music session is finished, open your eyes and rate your pain once again using the same 0 – 10 point pain scale.

Listening to soothing music can elevate mood, reduce apprehension and fear, diminish muscle tension, and increase relaxation.

How long should I listen?

Many people find 20-30 minutes of soothing music helps them relax and feel less anxious. The best effects of music are usually obtained within one hour after beginning to use music.

What is guided imagery?

Guided imagery is another complementary method for pain control. Guided imagery involves traveling to a pleasant place by using your imagination.

Relaxation and diminished pain are benefits of using guided imagery.

Guided imagery relies on the power of the mind to bring in all of the 5 senses (sight, smell, sound, taste, touch).

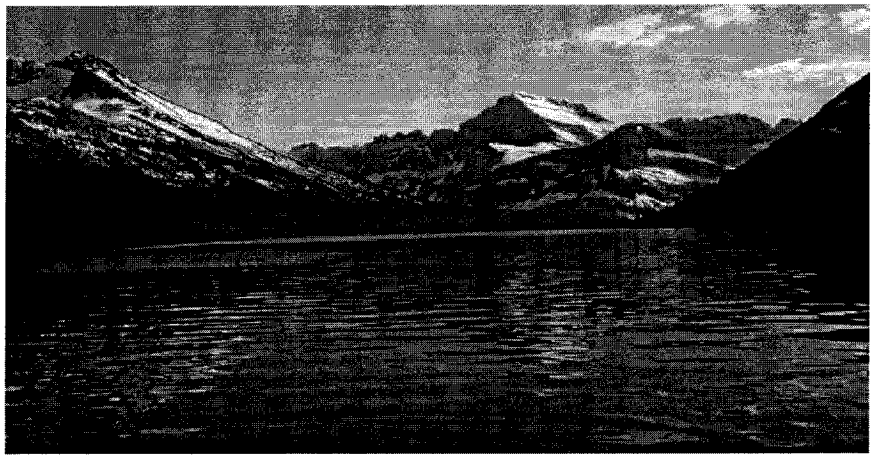
Advantages that you'll likely experience when using guided imagery include:

1) Increased control of your pain.

2) Decreased feelings of helplessness and hopelessness.

3) Increased sense of calmness.

4) Decreased pain, anxiety, and tension.



When is guided imagery most helpful in reducing pain?

1) When you rate your pain anywhere from 1 – 7 on a 0 – 10 point pain scale.

2) When you are between doses of pain medicine and still have some lingering pain.

3) Prior to participating in activities that you anticipate may require extra energy or cause increased pain.

4) After you have participated in events that required extra energy or that increased your pain.

5) Mid-afternoon when you have time to rest and relax.

6) When you feel anxious, fearful, angry, overwhelmed, or stressed.

7) About 20 to 30 minutes after taking oral pain medications.

8) At bedtime to prepare for sleep.

What type of guided imagery is right for me?

Guided imagery can be done by using an audiotape, CD, videotape, or by live instruction. The benefits of using an audiotape, CD, or videotape is that you can actively use guided imagery whenever you would like without the aid of another person.

Live instruction is not available at this time in this facility.

How do I participate in guided imagery?

1) Select a quiet environment and be sure the door is closed.

2) Ask your nurse to put a sign on your door to avoid interruptions.

3) Find and maintain a comfortable position (loose clothing and empty bladder).

4) Close your eyes.

5) Take 3-5 deep breaths in and out before beginning.

6) Focus on how your breath feels; the rhythm of your breath.

7) Silently repeat a word, sound, phrase, or prayer to help you concentrate on relaxing.

8) Use this imagery technique for several minutes but no more than 20 minutes at a time.

The results of each imagery session may vary.

MASSAGE THERAPY

to enhance pain control

What is massage therapy?

Massage therapy is a complementary method for pain control. It does not replace medication, but may be used to increase the effects of medicine.

Massage therapy may reduce stress by providing distraction.

When is massage therapy most helpful in reducing pain?

1) When you rate your pain as mild to moderate (that is, 1-7 on a 0-10 point pain scale).

2) When you are between doses of pain medicine and cannot have additional medicine.

3) Shortly after your pain medication has had time to take effect and you want to relax.

4) At bedtime when you want to prepare yourself for a good night's sleep.

5) You and your nurse can decide on a time and set a schedule.

What should I expect with my massage therapy session?

1) Immediately before the massage is started, you will be asked to rate your pain on a scale of 0-10 points, with 0 being no pain and 10 being the worst pain you can imagine.

2) The room is then prepared for the massage by closing the curtain and the door. A "Do Not Disturb" sign will be placed on the door to avoid interruptions.

3) The conversation level during the massage should be kept to a minimum to assist in greater levels of concentration on the massage itself.

4) The massage consists of slow, gentle, rhythmic strokes delivered by a nurse. The massage is done with uniform speed and light but firm pressure, 60 strokes per minute for 3 minutes.

5) The massages will be done at least 24 hours apart. You may receive a total of three (3) massages while you are getting better after your surgery on the hospital unit.

6) Immediately after the massage, you will again be asked to rate your pain using the 0-10 point pain scale.

Please use this pamphlet often while recovering from your surgery. Do not hesitate to ask your nurse for help whenever you have any questions about using music, imagery, or massage to enhance the effects of your pain medications.

We are interested in your comfort and hope that your use of these non-drug methods will help you feel more comfortable.

Please sign this page. Your nurse will collect it from you on the day of your surgery. Thank You.

I have read the teaching pamphlet on using music, guided imagery, and massage.

Patient Signature_____

Subject ID#_____

Nurse's first initial & last name _____

Appendix F

Read-only Digital Video Disc: Contains videotaped information about how to use music and self-guided imagery as non-drug interventions for pain management.

Please refer to pocket in back of dissertation.
Must be played in system containing a DVD driver.

Appendix G

NON-DRUG COMPLEMENTARY INTERVENTIONS SURVEY - Form A

Date _____ Study Volunteer # _____

Newport Hospital is interested in learning more about the ways in which patients who have had surgery are using teaching materials they receive. We are asking you to help us learn more about this by answering these questions. Place a mark in the box under the number that matches your best answer. **This survey is for research purposes only and will in no way change your medical care. . Please do not skip any items.** Thank you.

The first set of items asks you to rate ***how much you agree or disagree*** with statements about music, massage, and imagery.

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
1. The main reason for listening to music is to increase the effects of pain medicine.					
2. Slow stroke massage helps me relax most when my pain level is really bad.					
3. Listening to music alone without pain medicines does not help relieve my pain.					
4. Listening to soothing music is supposed to increase the helpful effects of pain medicines.					
5. The main purpose of massage is to stop me from thinking about my pain.					
6. Listening to soothing music allows me to take a more active part in dealing with my pain.					
7. The most common reason music is not used more for pain relief is a lack of desire to try it.					
8. The main benefits of massage are to lessen pain and improve rest.					
9. Non-drug measures work best to relieve severe pain.					
10. Using imagery can help a person feel less anxious.					

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
11. The best time to use imagery is just after I take a pain medicine.					
12. Before using music or imagery, I must be sure to choose a quiet place and get in a comfortable position.					
13. There are no special times when music will work best to help get a better effect from pain medicines.					
14. People get the most benefit from non-drug methods when their pain is mild to moderate.					
15. The use of imagery can improve the effects of pain medicines.					
16. There are no good reasons for using non-drug measures along with pain medications.					
17. Music is most helpful when a person wants to ease the tension and anxiety that often go along with pain.					

The second set of items asks you to rate ***the strength of your beliefs*** about using music, massage, and imagery to help you deal with your pain after surgery.

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
18. Nursing care should include the best of non-drug practices.					
19. Listening to soothing music may be an important tool for helping treat pain after surgery.					
20. Usual medical practice could benefit from using non-drug methods like music, imagery, and massage.					
21. I believe massage can reduce my stress.					

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
22. I don't believe guided imagery has any true effect on the treatment of pain.					
23. Nurses should be able to tell their patients about using music and imagery to be more relaxed.					
24. Using imagery may be a helpful tool in treating pain after surgery.					
25. I plan to continue listening to soothing music to relax me after I go home from the hospital.					
26. I believe using a mix of music, massage, and imagery will help me change the way I cope with pain in the future.					
27. I believe listening to soothing music helps with the treatment of pain.					
28. Knowing about non-drug pain methods is important to me as a patient.					
29. I plan to use imagery to help deal with my pain when I go home from the hospital.					
30. Teaching booklets given to patients before surgery should explain how to use non-drug methods for pain relief.					

Thank you for taking time to read and complete this survey.

For the research nurse only: After you complete your portion of the preadmission testing and introduce the patient to the pain service nurse, please remind the pain service nurse to go to the Study Protocol Assurance Checklist and fill in coded item #90-91 when s/he is finished with her portion of the preadmission testing day activities.

Appendix H

NON-DRUG COMPLEMENTARY INTERVENTIONS SURVEY – Form B

Instructions: Ask each study subject the questions below. If the subject indicates they DID NOT read the pamphlet, please circle 'None' in #1 below and place the survey in the locked research file. Then review the pamphlet with the patient.

If the subject DID read the pamphlet but DID NOT USE the information at home to practice, please circle #1 in question 3 and place the survey in the locked research file. Then review the pamphlet with the patient.

If the subject DID read and USE the pamphlet, please complete this form by reading each of the following survey items to the patient and circling the one response that most closely matches the patient's response. **Please do not skip any questions.** Please be sure to enter your initials at the end of the survey. Thank you.

_____ 1. How much of the teaching pamphlet did you read at home?
5 = All 4 = More than half 3 = Half 2 = Less than half 1 = None

_____ 2. How easy was it for you to read the teaching pamphlet?

5 = Very easy 4= Easy 3 = Neither easy nor difficult

2 = Difficult 1 = Very Difficult

_____3. Did you use the information in the pamphlet to practice at home?

____ 4 =Used music only ____ 3 = Used imagery only

____ 2 =Used music and imagery ____ 1 = Did not use

_____4. How frequently did you use the information since receiving the pamphlet?

5 = five times daily 4 = four times daily 3 = three times daily

2 = twice daily 1 = only once a day

Say to Patient: "This set of items asks you to rate ***how much of the time you used the instructions*** for using music and/or imagery when you practiced at home."

Item	None of the time (1)	Less than 1/2 the time (2)	Half the time (3)	More than 1/2 the time (4)	All the time (5)
5. Did you select music that was soothing to you?					
6. Did you control the lighting in the room when listening to soothing music and/or using imagery?					

Item	None of the time (1)	Less than 1/2 the time (2)	Half the time (3)	More than 1/2 the time (4)	All the time (5)
7. Did you find a quiet place to use music and/or imagery?					
8. Did you get into a relaxed position when using music and/or imagery?					
9. Did you breathe deeply and evenly when using music and/or imagery?					
10. Did you keep your eyes closed while using music and/or imagery?					
11. Did you travel in your mind to a pleasant scene while using imagery?					
12. Did you keep your mind empty of distracting thoughts while using imagery?					

For the research nurse only: Please go to the Study Protocol Assurance Checklist and fill in the space under item #14 (coded # 109-110). **Please place the completed survey in the locked research file.**

Thank you.

Pain Service Nurse Initials _____

Appendix I

NON-DRUG COMPLEMENTARY INTERVENTIONS SURVEY - Form C

Date _____ Study Volunteer # _____

Now that you have had time to use non-drug tools for pain relief, we want to know more about what you think and feel now about using music, imagery, and massage. Please answer each of the following questions by placing a mark in the box under the number that matches your best answer. **Please do not skip any items. This survey is for research purposes only and will in no way affect your ongoing or follow-up care.**

The first set of items asks you to rate ***how much you agree or disagree*** with statements about music, massage, and imagery.

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
1. The main reason for listening to music is to increase the effects of pain medicine.					
2. Slow stroke massage helps me relax most when my pain level is really bad.					
3. Listening to music alone without pain medicines does not help relieve my pain.					
4. Listening to soothing music is supposed to increase the helpful effects of pain medicines.					
5. The main purpose of massage is to stop me from thinking about my pain.					
6. Listening to soothing music allows me to take a more active part in dealing with my pain.					
7. The most common reason music is not used more for pain relief is a lack of desire to try it.					
8. The main benefits of massage are to lessen pain and improve rest.					
9. Non-drug measures work best to relieve severe pain.					
10. Using imagery can help a person feel less anxious.					
11. The best time for me to use imagery is just after I take a pain medicine.					
12. Before using music or imagery, I must be sure to choose a quiet place and get in a comfortable position.					
13. There are no special times when music will work best to help get a better effect from pain medicines.					

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
14. People get the most benefit from non-drug methods when their pain is mild to moderate.					
15. The use of imagery can improve the effects of pain medicines.					
16. There are no good reasons for using non-drug measures along with pain medications.					
17. Music is most helpful when a person wants to ease the tension and anxiety that often go along with pain.					

The second set of items asks you to rate ***the strength of your beliefs*** about using music, massage, and imagery to help you deal with your pain after surgery.

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
18. Nursing care should include the best of non-drug practices.					
19. Listening to soothing music may be an important tool for helping treat pain after surgery.					
20. Usual medical practice could benefit from using non-drug methods like music, imagery, and massage.					
21. I believe massage can reduce my stress.					
22. I don't believe guided imagery has any true effect on the treatment of pain					
23. Nurses should be able to tell their patients about using music and imagery to be more relaxed.					
24. Using imagery may be a helpful tool in treating pain after surgery.					
25. I plan to continue listening to soothing music to relax me after I go home from the hospital.					
26. I believe using a mix of music, massage, and imagery will help me change the way I cope with pain in the future.					
27. I believe listening to soothing music helps with the treatment of pain.					

Item	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
28. Knowing about non-drug pain methods is important to me as a patient.					
29. I plan to use imagery to help deal with my pain when I go home from the hospital.					
30. Teaching booklets given to patients before surgery should explain how to use non-drug methods for pain relief.					

This set of items asks you to rate ***how much of the time you used the instructions*** for using music and/or imagery.

Item	None of the time (1)	Less than 1/2 the time (2)	Half the time (3)	More than 1/2 the time (4)	All the time (5)
31. Did you select music that was soothing to you?					
32. Did you control the lighting in the room when listening to soothing music and/or using imagery?					
33. Did you find a quiet place to use music and/or imagery?					
34. Did you get into a relaxed position when using music and/or imagery?					
35. Did you breathe deeply and evenly when using music and/or imagery?					
36. Did you keep your eyes closed while using music and/or imagery?					
37. Did you travel in your mind to a pleasant scene while using imagery?					
38. Did you keep your mind empty of distracting thoughts while using imagery?					

Thank you.

For research nurse: Number of minutes to complete this survey _____

Number of minutes to complete the BPI –form B _____

(see bottom of BPI – form B)

TOTAL MINUTES _____

Appendix J

Knowledge Teaching Objectives Excerpt

Knowledge Domain Objectives	Specific Aims	Measures	Assessments
A. Describe the primary objectives for using music and imagery as non-drug pain interventions.	1. Patient knows that the primary reason for using music as a non-drug intervention is to augment the effects of the pain-relieving medications. (Good, et. al., 1999; Evans, 2002; Kwekkeboom, 2003).	A1a. "What is the main reason for using music along with the medicines you are taking to relieve your pain?"	* Nurse interview * Pre-intervention questionnaire
		A1b. "From the list below, select your main purpose for using music along with medications to manage your pain."	* Paper and pencil test
		A1c. "Identify your most important reason for using music as a non-drug pain intervention."	* Nurse interview * Pre/Post intervention questionnaire
		A1d. "Describe your main reason for combining the use of music and medications in your pain management plan."	* Nurse interview
		A1e. "Explain what happens to you when you use music to enhance the effects of your pain medications."	* Nurse interview
	2. Patient knows that the primary reason for using guided imagery is to decrease the effects of painful or unpleasant events by using ones' imagination to concentrate or focus on more pleasurable images. (VanFleet, 2000; Kwekkeboom, et. al, 1989; Halpin, et. al, 2002).	A2a. "Tell me what the primary reason is for using imagery along with the medicines you are taking to relieve your pain?"	* Nurse interview * Pre-intervention questionnaire

Appendix K

Attitude Domain Objectives Excerpt

Attitude Domain Objectives	Specific Aims	Measures	Assessments
A. Examine one's beliefs about the value of using imagery and/or music as complementary non-drug pain interventions.	1. Identify your current beliefs about the credibility of music and imagery to help you manage your post-operative pain.	A1a. "Share with the nurse what you believe may happen if you use music and/or imagery to help you manage your postoperative pain."	* Nurse Interview
		A1b. "Tell the nurse how you feel about using music and/or imagery as part of your pain management plan."	* Nurse Interview
		A1c. "From the list below, select those items that most closely match your current beliefs about using music and imagery to help manage postoperative pain."	* Paper & pencil test * Pre/post intervention questionnaire
		A1d. " Tell the nurse what level of interest you currently have in using music and/or imagery as parts of your pain management plan."	* Nurse Interview
	2. Judge the soundness of one's current beliefs about the potential benefits and risks of using music and/or imagery as part of one's pain management plan. (citations?)	A2a. "Tell the nurse how you would compare your current beliefs about music and imagery to what you have learned in the teaching intervention."	* Nurse Interview
		A2b. "Which of the statements below is a common myth regarding the use of music and/or imagery as a complementary non-drug pain intervention?"	* Paper and pencil test

Appendix L

Demographic Data Form

Subject ID# _____ _____ Information Coping Style: 1 = Monitor 2 = Blunter

_____ Age

_____ Gender 1 = Male 2 = Female

_____ Race 1 = White, non Hispanic 4 = Asian or Pacific Islander
2 = Black, non Hispanic 5 = American Indian or Alaskan Native
3 = Hispanic 6 = Unknown

_____ Marital Status 1 = Married 3 = Divorced
2 = Single 4 = Separated

_____ Educational Level 1 = <HS diploma 3 = Some college 5 = Graduate school
2 = HS Diploma 4 = College graduate

Prior Use of Non-Drug Interventions for Pain Management for Past Month
(Ask about each item)

[0 = no use 1 = seldom 2 = occasional 3 = frequently 4 = very frequently]

_____ Massage _____ Acupressure
_____ Music _____ Acupuncture
_____ Guided imagery _____ Heat or Cold
_____ Self-help education _____ Aromatherapy
_____ Prayer and/or Meditation _____ Herbs
_____ Yoga _____ Reiki or Therapeutic Touch

_____ Do you exercise regularly? 1 = Yes 2 = No

_____ Frequency of regular exercise

1 = Daily 2 = Every other day 3 = Twice a week 4 = Once a week

---

For healthcare provider:

How long did it take you to collect this information? (in minutes)

_____

Appendix M

Monitor/Blunter Style Scale (long form) Subject ID# _____

1. Vividly imagine that you are **afraid** of the dentist and have to get some dental work done. Which of the following would you do? Check **all** of the statements that might apply to you.

___ I would ask the dentist exactly what work was going to be done.

___ I would take a tranquilizer or have a drink before going.

___ I would try to think about pleasant memories.

___ I would want the dentist to tell me when I would feel pain.

___ I would try to sleep.

___ I would watch all the dentist's movements and listen for the sound of the drill.

___ I would watch the flow of water from my mouth to see if it contained blood.

___ I would do mental puzzles in my mind.

2. Vividly imagine that you are being held hostage by a group of armed terrorists in a public building. Which of the following would you do? Check **all** of the statements that might apply to you.

___ I would sit by myself and have as many daydreams and fantasies as I could.

___ I would stay alert and try to keep myself from falling asleep.

___ I would exchange life stories with the other hostages.

___ If there was a radio present, I would stay near it and listen to the bulletins about what the police were doing.

___ I would watch every movement of my captors and keep an eye on their weapons.

___ I would try to sleep as much as possible.

___ I would think about how nice it's going to be when I get home.

___ I would make sure I knew where every possible exit was.

3. Vividly imagine that, due to a large drop in sales, it is rumored that several people in your department at work will be laid off. Your supervisor has turned in an evaluation of your work for the past year. The decision about lay-offs has been made and will be announced in several days. Check **all** of the statements that might apply to you.

___ I would talk to my fellow workers to see if they knew anything about what the supervisor evaluation of me said.

___ I would review the list of duties for my present job and try to figure out if I had fulfilled them all.

___ I would go to the movies to take my mind off things.

___ I would try to remember any arguments or disagreements I might have had that would have resulted in the supervisor having a lower opinion of me.

___ I would push all thoughts of being laid off out of my mind.

___ I would tell my spouse that I'd rather not discuss my chances of being laid off.

___ I would try to think which employees in my department the supervisor might have thought had done the worst job.

___ I would continue doing my work as if nothing special was happening.

4. Vividly imagine that you are on an airplane, thirty minutes from your destination, when the plane unexpectedly goes into a deep dive and then suddenly levels off. After a short time, the pilot announces that nothing is wrong, although the rest of the ride may be rough. You, however, are not convinced that all is well. Check **all** of the statements that might apply to you.

___ I would carefully read the information provided about safety features in the plane and make sure I knew where the emergency exits were.

___ I would make small talk with the passenger beside me.

___ I would watch the end of the movie, even if I had seen it before.

___ I would call for the flight attendant and ask what exactly the problem was.

___ I would order a drink from the flight attendant or take a tranquilizer.

___ I would listen carefully to the engines for unusual noises and would watch the crew to see if their behavior was out of the ordinary.

___ I would talk to the passenger beside me about what might be wrong.

___ I would settle down and read a book or magazine or write a letter.

Appendix N

Miller Behavioral Style Scale (short form) Subject ID _____

1. Vividly imagine that you are **afraid** of the dentist and have to get some dental work done. Which of the following would you do? Check **all** of the statements that might apply to you.

___ I would ask the dentist exactly what work was going to be done.

___ I would take a tranquilizer or have a drink before going.

___ I would try to think about pleasant memories.

___ I would want the dentist to tell me when I would feel pain.

___ I would try to sleep.

___ I would watch all the dentist's movements and listen for the sound of the drill.

___ I would watch the flow of water from my mouth to see if it contained blood.

___ I would do mental puzzles in my mind.

2. Vividly imagine that, due to a large drop in sales, it is rumored that several people in your department at work will be laid off. Your supervisor has turned in an evaluation of your work for the past year. The decision about lay-offs has been made and will be announced in several days. Check **all** of the statements that might apply to you.

___ I would talk to my fellow workers to see if they knew anything about what the supervisor evaluation of me said.

___ I would review the list of duties for my present job and try to figure out if I had fulfilled them all.

___ I would go to the movies to take my mind off things.

___ I would try to remember any arguments or disagreements I might have had that would have resulted in the supervisor having a lower opinion of me.

___ I would push all thoughts of being laid off out of my mind.

___ I would tell my spouse that I'd rather not discuss my chances of being laid off.

___ I would try to think which employees in my department the supervisor might have thought had done the worst job.

___ I would continue doing my work as if nothing special was happening.

For research nurse only

Total M checkmarks _____ Total B checkmarks- _____ Total MB net _____

Appendix O

Elaboration of Fischbein and Ajzen's Theory of Reasoned Action

Fischbein & Ajzen's Theory of Reasoned Action (1975) was used to support the rationale for inclusion of survey items related to both knowledge and attitudes from the perspective of control of one's behavior and motivation to use the non-drug interventions. Theories addressing reasoning require individuals to be able to understand and process information, generally according to the rules of logic. Survey items addressing knowledge about music, self-guided imagery, and massage are essential in order to ensure inclusion of sufficient information upon which the patient may base a decision to act or not act (i.e. use or not use music, self-guided imagery, and/or massage).

In addition to the two primary elements of attitude toward the behavior, and subjective norm contained in the Theory of Reasoned Action, Ajzen's Theory of Planned Behavior specifically speaks to the critical nature of perceived behavioral control over performance of the behavior. As a central feature of one's *intention* to perform the behavior(s) in question, Ajzen describes perceived behavioral control (i.e. volition) as the immediate antecedent to behavior. This stance further supports the need to include survey items that explore patient attitudes about non-drug complementary methods as a measure of their beliefs about the feasibility and practicality of using non-drug methods for pain management, specifically, music, self-guided imagery, and massage. Roger's Diffusion of Innovations Theory (1983, 1995) was used as a framework for the study; both in the creation of the survey and frequency of use forms and in designing the teaching pamphlets, so as to hopefully

gather data whose feasibility and usefulness findings might be easily translated into everyday nursing practice. While Miller's Theory of Monitoring and Blunting (1987) was not specifically used to construct survey items, it was instrumental as a base from which a first attempt was made to create and pilot two 'information-friendly' teaching pamphlets for individuals having either monitoring or blunting information coping style preferences.

Appendix P

Use Of Non-Drug Complementary Pain Interventions Form

Subject ID# _____ Date _____Pain Service Nurse Initials _____

_____Day: 1 =DOS; 2=PO1; 3= PO2; 4= PO3; 5= T2DD; 6= T6DD

Instructions: Please ask study subjects the following questions during your first nursing assessment of the evening. Fill in the form completely. When finished, please place it in the locked research file. Thank you.

___**1**. How many times during the past 24 hours have you used music to help relieve your pain?

1 = None **(Skip to question #3)** 2 = one 3 = two 4 = three 5 = four 6= five or more

___ **2.** What type of music did you listen to the most often?

1 = classical 2 = piano 3 = harp 4 = synthesizer 5 = slow jazz 6 = orchestral

___ **3**. How many times during the past 24 hours have you used imagery to help relieve your pain?

1 = None **(Skip to question #5)** 2 = one 3 = two 4 = three 5 = four 6= five or more

___ **4**. What type of imagery scenario did you use most often?

1 = mountain scene 2 = ocean scene 3 = religious images 4 = personal experience

5 = other (please specify) _____

___**5**. How many times did you use music and imagery together over the past 24 hours?

1 = None 2 = one 3 = two 4 = three 5 = four 6= five or more

___**6**. How many times did you request a massage over the past 24 hours?

1 = Did not request **(Skip to question #8)** 2 = Once 3 = Twice or more

___ **7**. Did you receive the massage you requested? 1 = No 2 = Yes

___ **8.** Did you get enough pain medicine over the past 24 hours?

1 = No 2 = Yes

___**9**. How satisfied are you with the non-drug pain methods you chose?

1 = very dissatisfied 2 = dissatisfied 3 = neither satisfied nor dissatisfied

4 = satisfied 5 = very satisfied

Please write any additional patient comments below. Use the back of this page for more room.
Place the completed form in the locked research file. *Thank you.*

Appendix Q

Pain Management Chart Audit Instrument

Pain Treatments

1. Analgesic medications: (Drug name[s]) Orders: (Dose[s], route[s], schedule[s])

2. Adjunct medications (i.e. antidepressants, anti-inflammatory, anti-anxiety)
Treatment name Amount, directions

(313) _____3.Patient statement of teaching understanding signed by patient: 1 = no
2 = yes

4. *Complementary non-drug therapies*

Non-drug intervention Protocols	Frequency	Scheduled times	Documented use
A) Massage	_____	_____	(314) ____ 1 = no 2 = yes 3 = n/a
B) Music	_____	_____	(315) ____ 1 = no 2 = yes 3 = n/a
C) Guided imagery	_____	_____	(316) ____ 1 = no 2 = yes 3 = n/a

5. Use of pain-related consultants: 1 = No 2 = Yes

_____ Anesthesia

_____ Pharmacy

_____ Valerie Martin, RN

6. Other notes? (Use back of sheet for more space).

Auditor: _____
(Name)

Minutes required to complete audit: _____

Appendix R

Study Protocol Assurance Checklist

Instructions: Please initial and date each item in the following list as it is completed. Print your name and initials at the bottom of the page.
(Note: items 1-8 and 10 are to be completed by research assistant; items 9, and 11-16 by comfort therapy nurse on Turner 2; items 18-19 by comfort therapy nurse on Vanderbuilt).

Preadmission Testing Day	Nurse Initials	Date (mm/dd/yy)
1. Examine Physician prepared H&P for previous hx of mental illness		
2. Patient signs informed consent		
3. Screen patient with short form of MBSS		
4. Collect demographic data		
5. Pt. completes Non-Drug Survey - Form A		
6. Nurse administers BPI – Form A		
7. Teaching pamphlet given M _____ B _____		
8. Pt. views videotape		
9. Nurse & pt. develop pain management plan		
10. Instruct pt. to practice at home before surgery		
Minutes to complete items 1 – 10 (_____)		
Post-operative Days		
11 Use of Non-drug Complementary Pain Intervention DOS		
12. Use of Non-drug Complementary Pain Intervention POD#1 **Minutes to complete item 12 (_____)**		
13. Use of Non-drug Complementary Pain Intervention POD#2		
14. Use of Non-drug Complementary Pain Intervention POD#3		
15. Brief Pain Inventory - Form B		
16. Pt. completes Non-Drug Survey – Form C		
Minutes to complete items 15– 16 (_____)		
Day of Discharge from Acute Care		
17. Use of Non-drug Complementary Pain Intervention T2DD		
TOTAL ACUTE CARE MINUTES **[_____]**		
Day of Discharge fromVanderbuilt (Turner 6)		
18. Use of Non-drug Complementary Pain Intervention T6DD		
19. Brief Pain Inventory – Form C		
Minutes to complete items 18– 19 (_____)		

Nurse's Printed Name	Initials	Nurse's Printed Name	Initials

Appendix S

Copy of Lifespan Commendation Letter

Lifespan ORA QA/QI Program
Self Assessment Audit - Findings and Response
Self-Assessment Audit 3001-03
Marlene Dufault, RN, PhD

March 8, 2005

Marlene Dufault, RN, PhD
White Hall
College of Nursing
2 Heathman Road
Kingston, RI 02881

RE Study #: 3001-03

Dear Dr. Dufault,

Thank you for your response and completion of the self-assessment form forwarded to your attention February 1, 2005. The ORA appreciates your participation in this effort to enhance and maintain our commitment to a high standard of research and ensure protection for all research participants.

Your study appears well maintained and organized. The Office of Research Administration QA/QI program's main focus, beyond protection for all research participants, is assistance and education. We hope the experience has been helpful in some way. Investigators have used this form to help set up future studies. I can supply sample documents such as signature logs, monitor logs, inclusion/exclusion criteria forms, etc. should you have the need. Please feel free to contact me in the future if you have any questions or require any sample Case Report Forms. Thanks again.

Sincerely,

[redacted]

Patricia E. Houser, RN, MSJ
Research Administration Manager,
Compliance and Training

[redacted]

Throughout this document findings will be linked whenever possible to an International Conference on Harmonization Good Clinical Practice Guideline, ICH GCP, reference. See http://www.ncehr-cnerh.org/english/gcp/ for online reference.

Appendix T

Table 7.
Frequencies and Means of Knowledge Items From the NDCPI Before (Form A) and After (Form C) Teaching

	Frequency (n)		Percent (%)		Mean		SD	
Intervention status:	Before	After	Before	After	Before	After	Before	After

Scale score: 1: strongly disagree, 2: disagree, 3: neither agree nor disagree, 4: agree, 5: strongly agree

Q1. The main reason for listening to music is to increase the effects of pain medicine.

	(n = 45)	(n = 36)			3.13	3.75	1.14	.841
Strongly disagree	6	0	13.3	0.0				
Disagree	5	4	11.1	11.1				
Neither	14	6	31.1	16.7				
Agree	17	21	37.8	58.2				
Strongly Agree	3	5	6.7	13.9				
Total			100.0	100.0				

Q2. Slow stroke massage helps me relax when my pain level is really bad.

	(n = 45)	(n = 37)			3.64	3.86	.802	.822
Strongly disagree	1	0	2.2	0.0				
Disagree	1	2	2.2	5.4				
Neither	16	9	35.6	24.3				
Agree	22	18	48.9	48.6				
Strongly Agree	5	8	11.1	21.6				
Total			100.0	100.0				

Q3. Listening to music alone without pain medicines does not help relieve my pain.

	(n = 45)	(n = 36)			3.22	3.28	.998	1.08
Strongly disagree	2	2	4.4	4.4				
Disagree	7	7	19.4	19.4				
Neither	20	10	44.4	27.8				
Agree	11	13	24.4	36.1				
Strongly Agree	5	4	11.1	11.1				
Total			100.0	100.0				

Q4. Listening to soothing music is supposed to increase the helpful effects of pain medicines.

	(n = 45)	(n = 36)			3.56	4.08	.785	.368
Strongly disagree	1	0	2.2	0.0				
Disagree	3	0	6.7	0.0				
Neither	13	1	28.9	2.2				
Agree	26	31	57.8	86.1				
Strongly Agree	2	4	4.4	11.1				
Total			100.0	100.0				

Q5. The main purpose of massage is to stop me from thinking about my pain.

	(n = 45)	(n = 37)			3.29	3.73	.920	.805
Strongly disagree	1	1	2.2	2.2				
Disagree	10	1	22.2	2.2				
Neither	10	9	22.2	24.3				
Agree	23	22	51.1	59.5				
Strongly Agree	1	4	2.2	10.8				
Total			100.0	100.0				

Q6. Listening to soothing music allows me to take a more active part in dealing with my pain.

	(n = 45)	(n = 36)			3.67	4.06	.640	.532
Strongly disagree	0	0	0.0	0.0				
Disagree	2	0	4.4	0.0				
Neither	13	4	28.9	11.1				
Agree	28	26	62.2	72.2				
Strongly Agree	2	6	4.4	16.7				
Total			100.0	100.0				

Q7. The most common reason music is not used more for pain relief is a lack of desire to try it.

	(n = 45)	(n = 36)			3.64	3.72	.645	.813
Strongly disagree	0	1	0.0	2.2				
Disagree	2	0	4.4	0.0				
Neither	14	12	31.1	33.3				
Agree	27	18	60.0	50.0				
Strongly Agree	2	5	4.4	13.9				
Total			100.0	100.0				

Q8. The main benefits of massage are to lessen pain and improve rest.

	(n = 45)	(n = 36)			3.80	4.03	.649	.446
Strongly disagree	1	0	2.2	0.0				
Disagree	1	0	2.2	0.0				
Neither	7	3	15.6	8.3				
Agree	33	29	73.3	80.6				
Strongly Agree	3	4	6.7	11.1				
Total			100.0	100.0				

Q9. Non-drug measures work best to relieve severe pain.

	(n = 45)	(n = 36)			3.20	2.22	4.64	.887
Strongly disagree	6	6	13.3	16.7				
Disagree	16	19	35.6	52.8				
Neither	17	8	37.8	22.2				
Agree	3	3	2.1	8.3				
Strongly Agree	2	0	4.4	0.0				
Total			100.0	100.0				

Q 10. Using imagery can help a person feel less anxious.

	(n = 45)	(n = 35)			3.58	4.00	.657	.686
Strongly disagree	0	0	0.0	0.0				
Disagree	2	0	4.4	0.0				
Neither	17	8	37.8	22.9				
Agree	24	19	53.3	54.3				
Strongly Agree	2	8	4.4	22.9				
Total			100.0	100.0				

Q 11. The best time to use imagery is just after I take a pain medicine.

	(n = 45)	(n = 35)			3.22	3.63	.636	.731
Strongly disagree	0	0	0.0	0.0				
Disagree	3	2	6.7	5.7				
Neither	31	12	68.9	34.3				
Agree	97	18	2.0	51.4				
Strongly Agree	2	3	4.4	8.6				
Total			100.0	100.0				

Q 12. Before using music or imagery, I must be sure to choose a quiet place and get in a comfortable position.

	(n = 45)	(n = 35)			3.56	3.97	.813	.568
Strongly disagree	1	0	2.2	0.0				
Disagree	4	0	8.9	0.0				
Neither	11	6	24.4	17.1				
Agree	27	24	60.0	68.6				
Strongly Agree	2	5	4.4	14.3				
Total			100.0	100.0				

Q 13. There are no special times when music will work best to help get a better effect from pain medicine.

	(n = 45)	(n = 36)			2.98	2.91	.988	.887
Strongly disagree	2	1	4.4	2.9				
Disagree	12	11	26.7	31.4				
Neither	16	14	35.6	40.0				
Agree	14	8	31.1	22.9				
Strongly Agree	1	1	2.2	2.9				
Total			100.0	100.0				

Q 14. People get the most benefit from non-drug methods when their pain is mild to moderate.

	(n = 45)	(n = 35)			3.64	3.97	.773	.690
Strongly disagree	1	0	2.2	0.0				
Disagree	1	2	2.2	5.7				
Neither	15	3	33.3	8.6				
Agree	24	24	53.3	68.6				
Strongly Agree	4	6	8.9	17.1				
Total			100.0	100.0				

Q 15. The use of imagery can improve the effects of pain medicines.

	(n = 45)	(n = 35)			3.47	3.77	.588	.689
Strongly disagree	0	0	0.0	0.0				
Disagree	2	1	4.4	2.9				
Neither	20	10	44.4	28.6				
Agree	23	20	51.1	57.1				
Strongly Agree	0	4	0.0	11.4				
Total			100.0	100.0				

Q 16. There are no good reasons for using non-drug measures along with pain medications.

	(n = 45)	(n = 35)			2.31	1.91	.925	.818
Strongly disagree	7	11	15.5	31.4				
Disagree	21	18	46.7	51.4				
Neither	12	4	26.7	11.4				
Agree	57	2	11.1	5.7				
Strongly Agree	0	0	0.0	0.0				
Total			100.0	100.0				

Q 17. Music is most helpful when a person wants to ease the tension and anxiety that often go along with pain.

	(n = 45)	(n = 35)			3.91	4.20	.468	.632
Strongly disagree	0	0	0.0	0.0				
Disagree	0	0	0.0	0.0				
Neither	74	4	15.6	11.4				
Agree	35	20	77.8	57.1				
Strongly Agree	3	11	6.7	31.4				
Total			100.0	100.0				

Appendix U

Table 12.
Frequencies and Means of NDCPI Attitude Items before (Form A) and after (Form C) teaching

	Frequency (n)		Percent (%)		Mean		SD	
Intervention Status	Before	After	Before	After	Before	After	Before	After
Scale score: 1: strongly disagree, 2: disagree, 3: neither agree nor disagree, 4: agree, 5: strongly agree								
Q18- Nursing care should include the best of non-drug practices.								
	(n=44)	(n=36)			3.93	4.28	.661	.513
Strongly disagree	0	0	0.0	0.0				
Disagree	1	0	2.3	0.0				
Neither	8	1	18.2	2.8				
Agree	28	24	63.6	66.7				
Strongly agree	7	11	15.9	30.6				
Total			100.0	100.0				
Q19- Listening to soothing music may be an important tool for helping treat pain after surgery.								
	(n=44)	(n=36)			3.84	4.19	.526	.624
Strongly disagree	0	0	0.0	0.0				
Disagree	0	0	0.0	0.0				
Neither	10	4	22.7	11.1				
Agree	31	21	70.5	58.3				
Strongly agree	3	11	6.8	30.6				
Total			100.0	100.0				
Q20 – Usual medical practice could benefit from using non-drug methods like music, imagery, and massage.								
	(n=44	(n=36)			3.64	4.14	.613	.593
Strongly disagree	0	0	0.0	0.0				
Disagree	1	0	2.3	0.0				
Neither	16	4	36.4	11.1				
Agree	25	23	56.8	63.9				
Strongly agree	2	9	4.5	25.0				
Total			100.0	100.0				
Q21– I believe my massage can reduce my stress.								
	(n=44)	(n=36)			4.00	4.25	.682	.604
Strongly disagree	0	0	0.0	0.0				
Disagree	1	0	2.3	0.0				
Neither	7	3	15.9	8.3				
Agree	27	21	61.4	58.3				
Strongly agree	9	12	20.5	33.3				
Total			100.0	100.0				

Q22 – I don't believe guided imagery has any true effect on the treatment of pain.

	(n=44)	(n=36)			3.24	3.67	.743	.894
Strongly disagree	1	1	2.3	2.8				
Disagree	3	1	6.8	2.8				
Neither	27	13	61.4	36.1				
Agree	11	15	25.0	41.7				
Strongly agree	2	6	4.5	16.7				
Total			100.0	100.0				

Q23 – Nurses should be able to tell their patients about using music and imagery to be more relaxed.

	(n=44)	(n=36)			4.05	4.36	.526	.639
Strongly disagree	0	0	0.0	0.0				
Disagree	0	0	0.0	0.0				
Neither	5	3	11.4	8.3				
Agree	32	17	72.7	47.2				
Strongly agree	7	16	15.9	44.4				
Total			100.0	100.0				

Q24 – Using imagery may be a helpful tool in treating pain after surgery.

	(n=44)	(n=36)			3.66	4.06	.568	.984
Strongly disagree	0	1	0.0	2.8				
Disagree	1	2	2.3	5.6				
Neither	14	4	31.8	11.1				
Agree	28	16	63.6	44.4				
Strongly agree	1	13	2.3	36.1				
Total			100.0	100.0				

Q25 – I plan to continue listening to soothing music to relax me after I go home from the hospital.

	(n=44)	(n=36)			3.77	4.28	.742	.741
Strongly disagree	0	0	0.0	0.0				
Disagree	2	1	4.5	2.8				
Neither	12	3	27.3	8.3				
Agree	24	17	54.5	47.2				
Strongly agree	6	15	13.6	41.7				
Total			100.0	100.0				

Q26 – I believe a mix of music, massage, and imagery will help me change the way I cope with pain in the future.

	(n=44	(n=35)			3.71	4.03	.632	.822
Strongly disagree	0	0	0.0	0.0				
Disagree	0	2	0.0	5.7				
Neither	17	5	38.6	14.3				
Agree	23	18	52.3	51.4				
Strongly agree	4	10	9.1.4	28.6				
Total			100.0	100.0				

Q27 – I believe listening to soothing music helps with the treatment of pain.

	(n=45)	(n=35)			3.78	4.17	.560	.568
Strongly disagree	0	0	0.0	0.0				
Disagree	1	0	2.2	0.0				
Neither	10	3	22.2	8.6				
Agree	32	23	71.4	65.7				
Strongly agree	2	9	4.4	25.7				
Total			100.0	100.0				

Q28- Knowing about non-drug pain methods is important to me as a patient.

	(n=45)	(n=36)			3.89	4.22	.573	.591
Strongly disagree	0	0	0.0	0.0				
Disagree	1	0	2.2	0.0				
Neither	7	3	15.6	8.3				
Agree	33	22	73.3	61.1				
Strongly agree	4	11	8.9	30.6				
Total			100.0	100.0				

Q29 – I plan to use imagery to help me deal with my pain when I go home from the hospital.

	(n=45)	(n=35)			3.38	4.22	.716	.591
Strongly disagree	0	0	0.0	0.0				
Disagree	4	5	8.9	13.9				
Neither	22	9	48.9	25.0				
Agree	17	14	37.8	38.9				
Strongly agree	2	8	4.4	22.2				
Total			100.0	100.0				

Q30 – Teaching booklets given to patients before surgery should explain how to use non-drug methods for pain relief.

	(n=45)	(n=36)			3.98	4.31	.499	.577
Strongly disagree	0	0	0.0	0.0				
Disagree	0	0	0.0	0.0				
Neither	6	2	13.3	5.6				
Agree	34	21	75.6	58.3				
Strongly agree	5	13	11.12	36.1				
Total			100.0	100.0				

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