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The Effect of Telephone Follow-Up on Pain Experienced by Patients After Knee Replacement Surgery

Laurie J. Jones
Valparaiso University

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THE EFFECT OF TELEPHONE FOLLOW-UP ON PAIN EXPERIENCED BY PATIENTS AFTER KNEE REPLACEMENT SURGERY

by

LAURIE J. JONES

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K Mack 5/7/14
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DEDICATION

For my mom who has been my biggest cheerleader no matter what, I love you. Also for Kelly, Matt, Mark, and the rest of our wonderful family I am grateful for all of you and I love you.

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ABSTRACT

Hospital length of stays are decreasing throughout the U.S. in an effort to contain healthcare costs, but these measures can be detrimental to patients. Those who get knee replacement surgery are finding their length of stay reduced from an average of 3 to 4 days to 24 to 48 hours, which can affect pain control and interfere with rehabilitation and recovery. This affects many people, as more than 632,000 knee replacements occur each year (American Academy of Orthopedic Surgeons, 2008). The purpose of this evidence-based project was to evaluate the effect of telephone follow-up on pain experienced by knee replacement patients the first four weeks post-operatively. Orem's Self Care Deficit Theory and the Stetler's Model of evidence utilization were used to guide the project. Patients undergoing knee replacement were randomly assigned to the Intervention group or Usual Care group. The Intervention group received a scheduled telephone call each week for the first 4-weeks postoperatively and a completion call in week five. Those in the Usual Care group received one telephone call following the 4-week post-operative period. Each telephone call included the completion of a standardized questionnaire developed by the project coordinator. Pain coaching was offered to each patient by the project coordinator. Data were collected regarding the assessment of pain, the use of pain medication, and secondary concerns such as constipation, nausea, or edema. An independent-sample *t* test comparing the mean scores of the Intervention and Usual Care groups found a significant difference between the means (t (23)=-2.578, $p < .05$), with the Intervention group reporting less pain. Data collected on secondary outcomes indicated constipation accounted for 24% of patient concerns and edema accounting for 5%. Telephone follow-up for post-operative patients is being adopted at the clinical site where the EBP project was completed.

CHAPTER 1

INTRODUCTION

Half of all Americans will suffer knee pain caused by arthritis in their lifetimes (Arthritis Foundation {AF}, 2013). Knee pain limits the ability to complete activities commonplace in daily living and it decreases productivity, thus affecting the overall quality of life. In 2008, 27 million Americans over the age of 45 were living with osteoarthritis of the knees (AF). In 2011, the American Academy of Orthopedic Surgeons reported that there were 632,000 joint replacements completed annually. The AF indicated that 78.2 billion baby boomers would reach retirement age by 2011. The number of Americans with osteoarthritis is on the rise. The prediction made by the AF, that increased numbers of Americans receiving joint replacements will continue to increase, seems justified.

Background

In 2013, knee replacement surgeries were listed as one of the top 10 procedures being completed in hospitals by the American Academy of Hip and Knee Surgeons (AAHKS). The trend of increased numbers of replacements has continued. Historically, patients have stayed as long as seven days for postoperative care after a knee replacement. That time was spent working with physical therapy and receiving daily nursing care that included pain management prior to discharge. Gradually over time, the length of stay has been decreasing. This trend has resulted in an alarming number of postoperative patients having knee replacement surgery being discharged on the first day after surgery, a sharp change from the practices in place years before.

So, why have knee replacements become the new operational trend? There is no single reason driving the trend; it is due to several factors. The fact that Americans are living longer is well known. Along with the collective aging of the American population, the obesity rate is also climbing. The obesity rate in 1998 was 13.05 % and increased to 35.7 % in 2008 as reported by the Center for Disease Control and Prevention (CDC) (2013). Increased life expectancy is not a modifiable factor, but obesity-related joint degeneration is.

The term “arthritis” is well known by most adults in the United States and is generally used to describe the aches and pains that form as the body ages. Arthritis is actually an umbrella term that is used for a large number of musculoskeletal conditions, including osteoarthritis. Arthritis, in general, can affect all ages, races, and genders (AF, 2013). Women over 50 are affected more than men of the same age. Athletes who have experienced a major injury to a joint are also more susceptible to developing arthritis symptoms within 10 years.

In 2011, the AF stated that the annual cost of arthritis to the United States economy is estimated to be 128 billion dollars. Annual arthritis statistics include: (a) 44 patient visits, (b) 992,100 patients hospitalized, (c) 21 million Americans living every day with some form of activity limitation due to arthritis, and (d) 9,367 individuals dying from the effects of arthritis (AF). Among all the illnesses seen in the United States annually, arthritis causes the greatest number of patients to become disabled.

Osteoarthritis is known as the most common form of arthritis, the oldest identified in medicine, and the form that affects the knee (AF, 2013). Osteoarthritis is chronic in nature and involves the breaking down of the joint cartilage. Without the cartilage to act as a shock absorber when walking, the bones of the leg grind on each other and cause pain. Individuals with osteoarthritis often become sedentary since movement of the joint is painful and difficult.

In 1998, the National Institute of Health (NIH) released a statement saying, “Forty million Americans have some form of arthritis” and the “number was expected to climb to 59.4 million, or 18.2 percent of the population, by the year of 2020.” The American Academy of Hip and Knee Surgeons (AAHKS) reported that in 2006, 4.3 million older adults were experiencing knee osteoarthritis.

Kurtz, Ong, Lau, Mowat, & Halpern (2007) believed there would be a 673% increase in knee replacements by 2030, which equals 3.48 million surgeries per year. In 2008, the AAHKS (2013) also predicted that by 2030, annual primary hip and knee replacements would increase more than 600%, to an estimated 4.5 million.

The risk factors identified by NIH for osteoarthritis of the knee include: (a) age, (b) genetics, (c) injury to the joint, (d) weight, (e) employment involving kneeling or squatting,

inactivity, and sporting activities (2003). The AF (2013) also includes the risk factor of weak thigh muscles for osteoarthritis of the knee. When thigh muscles are weak, shifting weight and pressure are put onto the knee and surrounding joints and it is more difficult to carry the body's weight.

The aging population statistics are well documented and are a significant part of the increase in replacement surgeries occurring in the United States. In 2000, the population of adults aged 60 to 74 numbered 29,196,433. The same group in 2010 numbered 38,531,353, which is an increase of 9,334,920 Americans over the age of 60 (United States Census Bureau, 2013). The population of adults aged 60 and over increased by approximately 25% in ten years. All of these factors have helped to increase the prevalence of knee replacement surgery in the United States.

Statement of the Problem

There is currently a dramatic increase in the number of total knee replacements being completed each year. Discharge after surgery has been reduced from an average of three to seven days to an average of one day, post surgery. Patients are now being asked to manage their pain on their own. According to the literature, the pain is at its worst on day three. Those patients being discharged the day after surgery will already be home. Patients will be at risk of suffering from pain without the assistance and supervision of health care providers and of experiencing a delayed or incomplete recovery.

Data From the Literature

In 2008, Wilson, Schneller, Montgomery, and Bozic stated, "The approximately 750,000 U.S. hip and knee replacements performed in 2005 represent a 70% increase over a five year period." (p. 1588) The concern in 2008 was already the increasing demand and cost. Decreasing the length of stay for these procedures has become a cost savings measure. Previous length of stay of three to seven days allowed the pain medications to be adjusted at a time when the pain was at its worst.

The cost of health care has been extensively documented in the national media. Levine (2011) published an article in the AARP journal titled, "8 Key Facts About Knee Replacement Surgery," which addressed the cost of a knee replacement and the reimbursement the hospital is

likely to receive. The population requiring knee replacement, as well as the costs of the replacement, has dramatically increased. The balancing act required to provide care when reimbursement does not cover the cost of the care requires facilities to routinely make budget cuts to increase efficiency while trying to maintain quality and improve patient satisfaction. Orthopedics and knee replacement surgeries are not different from other areas of health care. The rising cost of medical care is public knowledge and documented by the Agency for Healthcare Research and Quality (AHRQ, 2012). With the rising costs and the increased demand, ways to reduce costs have become the priority for all departments involved. Facilities are standardizing orders and reducing length of stays as a way to reduce expenses in providing care.

In 2003, the hospital quarterly discharge rate for primary knee arthroplasty due to osteoarthritis was 94,500 or 378,000 annually. By 2010, the primary knee arthroplasties completed were 155,000 quarterly or 620,000 annually. Knee replacement procedures will continue to increase as the population ages. Healthcare costs associated with knee replacements are also increasing. In 2003, the cost for a primary knee arthroplasty for inpatients was $12,500 and by 2010 had increased to $16,000 (AHRQ, 2012). This trend was expected to continue and a primary knee arthroplasty is estimated to cost $17, 500 by the end of 2012. With over half of the knee arthroplasties being completed on Medicare patients, and reduced reimbursement and healthcare costs on the rise, length of stay is being decreased. Length of stay in 2003 was an average of 4.0 days and by 2010, it was reduced to 3.3 days (AHRQ). Length of stay is still being adjusted at the clinical site and discharges are being encouraged at 24 to 48 hours. Reducing length of stays can cause unnecessary pain and undue stress for knee replacement patients and their caregivers once they are at home. A lack of pain management can increase the time needed for recovery and interfere with a return to former mobility status. Patients have greater success rates after knee replacements if pain is well managed because it allows for greater participation in therapy (Salmon, Hall, Peerbhoy, Shenkin, & Parker, 2001).

Early discharge may save medical funding spent on inpatient hospital days, but it places the patient at risk in other areas. Patients being discharged after just two physical therapy

sessions on the first day can experience other medical concerns once they are at home. Early discharge can create a delay in rehabilitation and recovery and place patients in a pain crisis once at home. Ultimately, patients may end up in the emergency room with uncontrolled pain or constipation concerns. Akyol, Karayurt, and Salmond (2009) found that the first few weeks after surgery are difficult and that day three has been identified as one of the most painful days, a day patients released on day one will have to endure alone.

In 2003, results from a national survey published by Apfelbaum, Chen, Shilpa, Mehta, and Gan indicated that over 50% of post-surgical patients discharged early reported experiencing extreme or severe pain while at home. This survey revealed that an initiative had already taken place to address postoperative pain prior to the survey, which indicated that there was still a lack of pain control for postoperative patients who are discharged home. Patients will have better outcomes with appropriate pain control, which allows for them to fully participate in rehabilitation. Patients have a greater success rate after knee replacement if pain is well managed to allow for greater participation in therapy (Salmon et al., 2001).

Knee replacement patients struggle with transitions from hospital to home. Dossa, Bokhour, and Hoenig (2012) completed a longitudinal, qualitative study addressing transitions from hospital to home, acknowledging how important pain control is for patients once home. This study identified a patient that was discharged without proper pain control. After discharge, the patient was unable to contact the provider and declined therapy due to pain. This patient now lives with a permanent decrease in range of motion due to failure to proceed with therapy. This patient left therapy due to pain that was unmanaged. Pain can inhibit patients' willingness to participate in therapy and can affect their abilities to fully recover.

In 2005, Barksdale and Backer completed an exploratory, descriptive study to identify health-related stressors of patients who were discharged home after a total knee replacement surgery. This study identified the average length of stay as five in-patient days. Barksdale and Backer's study identified two areas of major concern for patients and their caregivers: pain and constipation. Many other studies have been completed and like Barksdale and Backer, pain is a concern. In 2009, Grinstein-Cohen, Sarid, Attar, Pilpel, and Elhayany completed a review of the

literature on current pain management and noted, “Despite an increased focus on pain management programs and the development of new standards for pain assessment, patients continue to experience intense pain after surgery” (p. 232).

Data from the Clinical Agency

A small community hospital in Northwest Indiana will be the agency of choice for this EBP Project. This community hospital is part of a larger group, which has many hospitals across the state of Indiana. The clinical site is a 227-bed facility and was the first in the region to receive Magnet designation and remains a non-profit hospital governed by a board of directors.

There are four orthopedic surgeons and two orthopedic nurse practitioners on staff. Clinical site statistics were requested from the surgery department and are included for comparison. In 2011, there were 1013 orthopedic surgeries completed and 51 were knee replacements. In 2012, there were 1056 surgeries completed and 116 were knee replacements. If the projections predicting a 673% increase in joint replacements by 2030 are correct, the clinical site should anticipate a 29% increase in knee replacements each year. Between 2011 and 2012, there was an increase of over 100%. The year 2013 exceeded the 2012 total knee replacement statistics.

Purpose of the Evidence-Based Practice Project

The clinical question identified and used in the development of this EBP project was, “What is the effect of telephone follow-up by an Advance Practice Nurse (APN) on pain experienced by knee replacement patients in the first four weeks after discharge?” The purpose of the EBP project was to evaluate the effectiveness of increased communication with an APN that included pain coaching. Early discharge leaves patients unprepared for what they will be experiencing once they are at home. Education provided prior to surgery and postoperatively still does not prepare patients for the pain they may feel on the days following surgery. Using a standardized questionnaire and intervention sheet, the APN made weekly follow-up phone calls providing coaching for the patients and their caregivers.

It was anticipated that the intervention group who received the follow-up telephone calls would have improved outcomes related to pain control. Secondary outcomes that were

anticipated included: (a) earlier than expected improved mobility, (b) decreased anxiety, and (c) improved satisfaction.

PICOT Format

The PICOT question as defined by Melnyk and Fineout-Overholt (2011) is: What is the effect of telephone follow-up by an APN on pain experienced by knee replacement patients in the first four weeks after discharge? Melnyk and Fineout–Overholt state, “When asked in a PICOT format, it results in an effective search that yields the best, relevant information and saves an inordinate amount of time” (p.11).

Significance of the EBP Project

Indiana’s population, like the rest of the nation, is aging. Indiana’s estimated population in July 2013 was 6,537,334. Those aged 45 or older numbered 2,564,257, which is 40 % of the population. All of the literature reviewed predicted significant increases in knee replacement procedures being completed annually each year until 2030. In 17 years, Indiana’s population aged 45 and older will be 62 years or older and will likely be receiving some form of osteoarthritis treatment by 2030.

The county in which the clinical site is located has only one hospital. The local hospital is not large enough or equipped to care for that many inpatients. Compliance with length of stay for next day discharge is expected. By 2030, one can expect same day knee replacement surgery. Proactively working toward a process to address the needs of the patients who are participating in early discharge is in the best interest of the patients. Using EBP is the “key to delivering the highest quality of healthcare and ensuring the best patient outcomes” (Melnyk & Fineout-Overholt, 2011, p. 3).

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

Theoretical Framework: Self Care Deficit Theory

The self-care deficit theory of nursing by Dorthea Orem is a middle-range nursing theory that has been utilized in rehabilitative nursing. This theory was updated by Orem with Denyes and Bekel in 2001 and continues to be relevant today. Orem (1995) stated that the basic tenets of the theory are that self-care is a requirement that either must be performed by or for individuals in order to maintain life. A deficit occurs when individuals are unable to care for themselves. Nurses can help identify these deficits and assist individuals in returning to their highest levels of functioning. This is particularly useful for rehabilitative nursing. In 1979, Dorthea Orem wrote, "Theory formation from its beginning stages is based on premises about nursing that are self-evident. One such premise is that nursing is a form or type of human assistance" (p.156). Having a total knee replacement is a painful and difficult adjustment for the patient. Knee replacement patients are both male and female and usually over 50 years of age. Patients want to get back to normal as quickly as possible and are often afraid of walking after surgery because they are fearful of pain and doing damage to their replaced knees. Therapy, assistance, and self-determination to recover are needed in order for patients to return to their pre-surgical baseline function.

Orem's theory addresses the interrelationship between nursing, patients, and patients' self-care needs that includes inherent responsibilities for both nurses and patients. The self-care deficit theory of nursing is a combination of three theories and was defined by Orem as "expressions of a theory of self-care, a theory of self-care deficit, and a theory of nursing system (2001, p. 141). Within each of the three theories are four postulated entities common to each theory. The entities describe the ontology or realities that are the focus of the theories. The four entities include: a) persons in space/time matrices such as nurses and patients with self-care deficits, b) properties of persons, such as nursing agency, health-related self-care deficit, and self-care agency, or relationships, such as nursing legitimacy and relationship legality, c) motion

or change, such as change in self-care deficit and seeking nursing assistance, and d) product, such as the nursing system, agreement to receive nursing services, and the self-care system (Orem, 1995).

The central idea behind the concept of self-care is that it is a human regulatory function (Orem, 1995). Self-care develops in mature individuals and must be learned and deliberately performed. Once developed, it can prevent injury and lead to healthy behaviors. The self-care functions that individuals complete are part of the "self-care agency" identified by Orem. A person's agency is the individual's ability to take the actions necessary in order to complete self-care tasks (Denyes, Orem, & Bekel, 2001).

Denyes et al. (2001) state that the theory of self-care deficit defines when and why people need nursing-care. The patient in Orem's explanation is able to legitimize the need for assistance. A patient's level of assistance maybe temporary, permanent, partial, or full. Patients and family members are involved in the decision-making process in regards to the level of assistance required. The theory of nursing system describes the roles and responsibilities of nurses in meeting the needs of their patients (Denyes, et al., 2001).

Theoretical framework applied to EBP Project

In her self-care deficit theory, Orem identified five premises about human beings that can be applied to adults who decide to schedule a total knee replacement surgery. Although there is a loss of independence during the recovery period, these individuals deliberately choose to accept a temporary self-care deficit because surgery will maximize their function. The five premises identified by Orem (1995) include: The first premise is that human beings must make constant assessments and decisions about their environment to maintain their existence. Orem identifies the second premise in human agency is the ability of humans to act purposefully and care for themselves and others while choosing to make decisions to that are correct to sustain life. The third premise is that mature human beings place limitations on themselves to ensure an appropriate supply to sustain life. The fourth premise in human agency includes being part of the greater good by helping others identify what is needed to sustain life for self and others. The fifth

premise is that human beings in a group will work together to make required choices to sustain life for self and others.

The deliberate self-care actions for a patient suffering from knee osteoarthritis can include some or all of the following: x-rays, physical therapy, cortisone injections, Euflexa injections, arthroscopic surgery, and pain medications. Nursing is closely involved in assisting and educating patients regarding these self-care actions. Once the decision is made to schedule knee replacement surgery, mature adults accept that they will be temporarily dependent. This creates a deficit in their abilities to care for themselves. When these deficits exist and self-care needs are unable to be met, nursing determines patient needs, utilizes available resources, and provides care and assistance until recovery is achieved.

Once a mature adult makes the decision to schedule a knee replacement, they are willingly entering a self-care deficit area. Having a knee replacement places a patient in a dependent state. The mature adult human being is agreeing to receive nursing assistance under these conditions. This is a partial temporary need and the mature adult human being is expecting to return to an independent state.

Strengths and Limitations of the Self Care Deficit Theory

Orem's theory demonstrates its value in nursing today by its continued use. Completing a literature search on Cumulative Index to Nursing and Allied Health Literature (CINAHL) identified several current articles that applied the theory to research questions. Im and Chang (2012) noted Orem as one of four main "grand theorists or theories" being used frequently in current literature.

Orem's theory is functional in many areas of nursing and in many different settings. The self-care theory concentrates on the physical aspect of the patient's needs. Patients having a knee replacement have a physical need that makes them dependent on nursing. Although a joint replacement is a physical experience, there are emotional aspects to having surgery. Using the Orem model from the nursing focus will allow the project coordinator to consider all six perspectives when providing pain coaching. Orem (1995) identifies six components to consider when engaging in self-care: physician's perspective of the health situation, patient's perspective, patient's state of health, health results sought, the self-care demand, and current

abilities/disabilities for self-care of the patient. Taking these steps will allow the project coordinator to engage in pain coaching for the first four weeks after discharge.

The future of health care demands patient-centered care. Reimbursement will depend on quality outcomes and patient satisfaction. The Orem model guides nursing to provide the best care possible in a patient-centered health care system.

EBP Model of Implementation

The Stetler Model was chosen as a guide for this EBP project. The focus of the model is on clinicians implementing research findings at the bedside (Stetler, 2001). The model, originally developed by Stetler and Marram in 1976, formulated a series of critical thinking and decision-making steps designed to facilitate safe and effective use of research findings (Stetler, 2010). The Stetler model today is a prescriptive, critical thinking approach to providing evidence-based practice care. Revisions to the model began in 1994 and included a name change to the "Stetler Model" and the integration of evidence-based practice. The Stetler model allows for a step-by-step approach that utilizes critical thinking and evidence. According to Melnyk and Fineout-Overholt (2011), the Stetler model's five-phase approach to evidence includes: preparation, validation, comparative evaluation/decision-making, translation/application, and evaluation.

Phase I: Preparation. The first phase identifies a perceived problem and begins with the formation of a clinical question. In this project, the clinical question is: What is the effect of telephone follow-up by an APN on pain experienced by knee replacement patients in the first four weeks after discharge? A literature search for relevant evidence related to the clinical question was conducted. Other considerations in the preparation phase include: timelines, project setting resources, and patient beliefs.

Phase II: Validation. The literature identified is critically reviewed and analyzed. The evidence is critiqued and graded. Melnyk and Fineout-Overholt (2011) appraisal checklists will be utilized to validate and grade evidence. A literature review log is kept on each study and a table listing the levels of evidence is utilized. Stetler (2001) also recommends both a methodologic and utilization factor table, each with a related set of detailed instructions. Studies that are not credible

are eliminated. If the literature reviewed demonstrates enough evidence for support of the PICOT question, it is included.

Phase III: Comparative evaluation/decision making. The Stetler model involves the synthesis of the evidence (Stetler, 2001). Once a problem has been identified and the literature is located, time is spent evaluating the information to assess the quality of the literature located. Is the evidence enough to support a change in practice? This change will also affect the practice and those it serves. Using this step-by-step process of critical thinking provides the practitioner with the current evidence, in an organized manner, to evaluate and synthesize the findings. Once the practitioner has evaluated the data, Stetler identifies the following options: to not use or reject the findings, to use or accept the findings, to consider use, or delay until further information is available (2001).

Phase IV: Translation/application. The model translates the research findings into a plan for change that is appropriate for the PICOT question and the environment where the change is to take place. The practitioner or team has previously identified a problem or question and completed the research. Once the appropriate answer(s) were identified, a plan was put into place that is appropriate for the facility or clinic where the change is needed. Taking all the variables into consideration, the change is planned to put the evidence-based practice in place.

Phase V: Evaluation. This phase may take place in two different phases: (a) use (b) consider use (Stetler, 2001). If the change occurred, the use phase would then evaluate outcomes and goal achievement. Evaluation takes place to identify to what degree the change was implemented and whether the goals were met. (Melnyk & Fineout-Overholt, 2011).

Application of Stetler Model

As in phase one of the Stetler model, a change occurred in the practice for patient care, which developed a concern and raised a clinical question. The purpose of this EBP project was to assess the effect of telephone follow-up on pain experienced by knee replacement patients after discharge home. At the clinical site, the expectation for discharge of joint replacements is post-operative day one. There currently is no plan in place to assist patients in the management of

pain upon discharge. First, follow-up appointments occur at approximately one week, when post-operative days 3 to 5 are the most problematic for pain.

Phase I: Preparation. The clinical question: What is the effect of telephone follow-up by an APN on pain experienced by knee replacement patients in the first four weeks after discharge?

Guided by the PICOT question, a systematic search would take place for relevant evidence. Also in this phase, internal and external factors will need to be considered. The external factors to be addressed are as follows: staffing needed, printed materials, training, two locations, scheduling follow-up calls, patients' time and phone availability, and staff willingness to participate. The internal concerns that need to be addressed include the patient's expectation of pain and his/her decreased abilities.

Phase II: Validation. Systematically review and critique the evidence with the focus of the PICOT. The evidence is then summarized for its strength, rate, and level of evidence. Stetler (2001) recommends the use of a table to structure the evidence. Once non-credible sources are eliminated, Stetler's model moves goals forward if evidence is positive, or ends the process if insufficient credible, external evidence is identified during the literature searches.

Phase III: Comparative Evaluation/Decision Making. In this phase, the project coordinator is fully engaged in the evidence. The evidence is validated, organized, and evaluated for use in the setting or project. Young (2011) identified the following criteria must also be considered before beginning a project: feasibility, pragmatic, current practice, possible risks, available resources, assess the readiness for change by the organization, and is the proposed change appropriate for the health care setting.

Phase IV: Translation/application. In this phase, the research/project findings are applied to the practice setting. Melnyk and Fineout-Overholt (2011) describe this phase as taking the findings, making an acceptable plan, and implementing that evidence-based plan (p. 247). Stetler (2010) and Melnyk and Fineout-Overholt (2011) both identify the importance of making decisions about how the findings will be put into practice. One group may plan to use the

evidence and another group may consider use of the evidence. There may be a pilot program used, as opposed to a plan for full application of the change to a unit or clinic.

Phase V: Evaluation. Evaluate the intervention of the EBP project. The statistical evaluation will provide measurable outcomes. The measureable outcomes will be used to evaluate the effectiveness of the pain-coaching intervention utilized for this project.

Strengths and Limitations of the Model

The Stetler model is based on the use of critical thinking and is practitioner-focused. This is a strength. This model originated utilizing nursing as its background and was developed to be implemented at the bedside. This model is a prescriptive model and is for non-nursing members of the team, panel, or committee. The goal of the model is to be explicit and transparent; the process is systematic and has been critically appraised. The Stetler Model is known for high validity and has been used in the literature published for over 30 years.

Limitations, noted by clinicians when questioned, include lack of ease of use and lack of clarity. Due to the level of complexity, the staff nurses (on all three versions) needed mentoring to complete the model. Advanced-level nurses equipped with a research background best utilize this model.

Literature Search

Sources Examined for Relevant Evidence

To become further educated in the process of searching the literature, an expert was consulted in the Valparaiso University Christopher Center Library. This endeavor provided a more precise list of terms and subject headings to facilitate the comprehensive systematic search necessary to discover relevant evidence for this EBP project.

Conducting a literature search must first start with an appropriately formulated question. The PICOT format assists the project coordinator in performing a comprehensive, systematic review of the literature in an effort to find the most relevant peer-reviewed evidence. Appropriate key terms were identified and MeSH headings were utilized. Key terms used for this search included: (a)(MM “telenursing”) OR (MM“telephone”), (b) (MM “postoperative complications”) OR (MM “postoperative”), (c) (MM “early patient discharge”) OR (MM “ patient discharge”) OR (MM

"aftercare"), and pain. On MEDLINE, not all of the key terms were MeSH terms, and adjustments were necessary.

Six databases were searched for relevant evidence. These databases included: the Cochrane Collaboration and Library, CINAHL, Joanna Briggs Institute Clinical Online Network of Evidence for Care and Therapeutics (JBI ConNect), MEDLINE via PubMed, National Guideline Clearinghouse, and Proquest Nursing and Allied Health Source. A hand search of the National Institute of Health identified one clinical trial that was reviewed. Searches were completed using a time frame from 2003 through 2013. However, on MEDLINE and Cochrane, there were no time limits applied.

Inclusion and Exclusion Criteria

The criteria utilized during the literature search for inclusion and exclusion criteria included: peer-reviewed, English language, and literature published between 2003 and 2013. Although the EBP will include a telephone intervention for adults with a first time knee replacement, the literature search did not use the exclusion criteria of adult population. Patients receiving knee replacements who were living in long-term care were excluded from participation.

An initial search on Proquest yielded 4915 results. A time limit of 3 years reduced the results to 883. Adding the term 'orthopedic' reduced the results to 237. The term 'anxiety' reduced the hits to 102. The final limitation, (the addition of the term 'pain') reduced the results to five.

CINAHL was then searched using the key terms previously identified. There were 39 results reviewed cursorily, and of those, 10 were saved for further review. MEDLINE was searched using the mesh term "telephone" or "telenursing" and "postoperative" or "discharged" or "aftercare" and "postoperative pain". Without time limits, there were 70 results. Once a ten-year time limit was added, 25 results remained for review; most of these were excluded previously from CINAHL or ProQuest. JBI and National Clearing House were searched to no avail. The search on Cochrane resulted in one systematic review for review. ProQuest also resulted in one article for review, with several results that had been duplicates from CINAHL. CINAHL, the first database utilized, yielded the best results. The search on CINAHL included the mesh terms "telenursing" or "telephone", "postoperative complications" or "postoperative pain", and "early

patient discharge" or "patient discharge" or "aftercare". The limits of peer-reviewed, English language, and 2003 through 2013 were applied. There were 39 results, with 25 that were rejected right away. A more extensive review was completed of the 14 remaining articles and one additional article was rejected. The search included a total of 13 relevant articles for evaluation from three databases and one hand search.

After reviewing the clinical question and the literature, it is important to know about the quality of the source. Leveling the evidence is important. Melnyk – Fineout-Overholt (2011) stated, "When searching for answers to clinical questions, all evidence should be considered", but with caution (p. 42).

Levels of Evidence

Melnyk & Fineout - Overholt (2011) identified a Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions, was utilized for this EBP project. The levels are identified as follows:

Level I: Evidence from a systematic review or meta-analysis of all relevant RCTs

Level II Evidence obtained from well-designed RCTs

Level III: Evidence obtained from well-designed controlled trials without randomization

Level IV: Evidence from well-designed case control and cohort studies

Level V: Evidence from systematic reviews of descriptive and qualitative studies

Level VI: Evidence from single descriptive or qualitative studies

Level VII: Evidence from the opinion of authorities and/or reports of expert committees

There are many different hierarchies available. Utilizing the seven-level hierarchy, the studies identified in the literature are in the following levels: Level I- one, Level II- seven, Level IV- three, Level VI- one, and Level IIV- one. One study was rejected during the review process. The study was related to telephone follow-up, but on patient satisfaction (see Table 2.1).

Level I - Level I evidence, considered the highest level of evidence, was included in this EBP project. The Cochrane Collaboration database identified a review by Mistiaen and Poot

(2008) that focused on telephone follow-up after discharge. The review includes 33 RCTs and total patient participation of 5,110. However, the author's results showed an extreme level of diversity throughout the studies, and it was difficult to draw any significant conclusions. Mistianen and Poot concluded that some studies did have favorable effects for telephone follow-up, and none of the studies had negative effects regarding the intervention. The authors identified a need for larger, higher quality studies with measureable validated questionnaires and tools.

Level II – Five studies were identified on CINAHL and one was retrieved from ProQuest. All six studies are RCTs and telephone follow-ups, with five following a surgical procedure and one study of first time mothers after discharge. Hannan (2012) completed the study utilizing telephone follow-up to support 70 first-time mothers. Hannan's conclusion was, "APNs are uniquely positioned to conduct follow-up interventions aimed at providing continuity of care including APN telephone follow-up" (p. 262). Educational telephone calls were utilized for follow-up with 60 patients discharged after radical prostatectomy surgery. The authors concluded that "despite extensive pre-operative and post-operative teaching, patients continue to express concerns as they transition to self-care after discharge" (p. 91). "Telephone follow-up may be an effective method to assist patients in recalling information (Inman, Maxson, Johnson, Myers, & Holland, 2011, p. 84). Both of these studies provided support for the use of telephone follow-up..

Hodgins, Ouellet, Pond, Knorr, and Geldart (2008) completed a RCT study on orthopedic surgical patients and the effect of telephone follow-up on their recovery. The sample size was 438 randomly assigned patients. The top three complaints were constipation, edema, and pain. This study lacked statistical significance when completed. Yet patients' satisfaction with the process remained high. Justification for the lack of statistical significance noted by the authors included: RN had to add the task to her task list, calls were completed the day after discharge, calls were too brief, and calls were made in a manner just to complete the task.

An earlier study by Ouellet, Hodgins, Pond, Knorr, and Geldart (2003) was completed with 53 participants on telephone follow-up as an intervention, but this focused more on the process of the intervention rather than on the scope of completion. Notable results included post-discharge complications related to pain, bowels, altered eating habits, edema, and inability to

complete ADL's. Suggestions regarding how to make telephone follow-up most beneficial included: clear goals, established protocol, sufficient time to conduct the calls, and a caller with expert communication skills. These studies provided valuable information for this EBP project. The 2003 and 2008 studies were rated as good quality studies.

Level II - A study in the British Medical Journal that compared hospital follow-up to telephone follow-up was completed using random assignment. This study had 374 participants and the participants concluded that telephone follow-up was a positive experience. This intervention was only an option for those with no or low risk of complications. In this study, the follow-ups were used for rural post-operative appointments. Patients reported greater satisfaction, less stress, and greater comfort in their own homes when able to communicate with professionals. Patients with limited mobility experienced even greater satisfaction. This study provided support for this EBP Project.

Level II – A RCT study was completed on next day discharge and telephone follow-up by Pfeil, Mathur, Singh, Morris, Green, and Kulkami (2007). In this study, group one received one home visit and one follow-up telephone call. Group two received two follow-up telephone calls. Group one had 21 participants and group two had 35 participants. A comparison of the groups was completed and patients felt equally safe and supported. Although this was a small study, it provided relevant evidence for this EBP Project.

Level IV – There are three studies in this category. Two studies were retrospective chart reviews and one was a pilot study. All were retrieved from CINAHL. Czarnecki, Murphy Garwood, and Weisman (2007) completed a study on APN-directed telephone management of pain following surgery. This study reviewed 61 patient charts and found that the APN provided support via telephone for pain management for pediatric spinal fusion patients. The APN's care was found to be a positive experience for patients and families. The author acknowledged limitations in the study due to size and the lack of control over the home environment. However, the program was so successful in the author's hospital that it was expanded. The second Level IV study used telephone follow-up to impact a reduction in hospital readmissions. This study was a retrospective cohort study and was completed on all members of a commercial insurance plan that were

hospitalized. Participants included 30,272 members who had been discharged in 2008. Calls were received within 14 days of discharge and patients had not been readmitted to the hospital. The focus of the calls were on medication changes, follow-up appointments, treatments at home, any special instructions, and ways to avoid exacerbations. This study, although not necessarily reporting on pain, is significant in that a reduction of readmissions was a secondary outcome.

The pilot study by McGinley and Lucas (2006) included telephone follow-up after completion of intra-articular knee injections. The goal of the study was to test the effectiveness of APN telephone follow-up in lieu of follow-up appointments three months after the injection. Patient reception to the project was positive. The study was small with 30 participants. The pilot was successful and a permanent telephone follow-up system has been put in place.

Level VI – One level VI study was identified on CINAHL and focuses on postoperative telephone calls and when they should be completed. This study was completed by Jane Flanagan (2009) and was working toward improving telephone follow-up by identifying the best time to place the telephone call. A convenience sample of 77 patients undergoing knee arthroscopy participated. Flanagan notes that healthcare is shifting to an outpatient model but the focus has remained inpatient. Also, new care models need to be developed to accommodate the new healthcare environment we are living in. This study reinforced the idea that patients need telephone interventions to reinforce teaching and to address concerns once home. Patients are not prepared even with pre- and postoperative teaching.

Level VII –A review by Delgado-Paddler and McCaffrey (2005), retrieved from the CINAHL database, examined the use of post-discharge telemanagement to help reduce readmissions. The authors reviewed five studies and patient participation was in 2008. The author's conclusion and remarks were favorable regarding telemanagement and APN involvement. Noted specifically by Delgado-Paddler & McCaffrey, APNs are best suited in outpatient care coordination and follow-up. APNs can provide written orders for outpatient therapy, labs, consults, medications, and coordinate follow-up appointments with other health care providers. APN's specialized assessment skills and ability to provide necessary interventions helps to improve patient outcomes.

Appraisal of Relevant Evidence

There are many different hierarchies available. The preceding pages identified Melnyk-Fineout-Overholt's adaptation from Guyatt & Rennie's Users' Guide, the Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions. The most important point is to use a variety of sources that are valid, reliable, and applicable to the PICOT question for the EBP project.

Melnyk and Fineout-Overholt (2012) compared the past to the present in regards to how decisions are made in practice. Today practitioners and providers use systematic inquiry, personal expertise, and include the patient's choice before making decisions about care and before providing care. When evaluating the evidence, one must consider the quality, quantity, and consistency of the evidence. When appraising evidence, key questions to ask about a study when completing a rapid first appraisal include: is it valid, is it reliable, and is the study applicable?

Validity involves randomization of participants and any trials of the study. Reliability involves any intervention trial and the effectiveness of the trial. Applicability applies to the participants being similar to the expected participants in the EBP Project and whether there were any risks involved. Once the best available evidence is identified, it is to be critically appraised for inclusion in the EBP Project.

Construction EBP

Literature Synthesis to Support EBP

The evidence supporting the benefits of telephone follow-up included these patient issues: (a) concerns about transitioning home, (b) perceived lack of availability of help once home, and (c) fear of pain. The positive or most beneficial aspects of a telephone follow-up program conducted by an APN include: (a) patients value the follow-up calls, (b) provides the patients with a better sense of wellbeing, and (c) patients report greater satisfaction (Delgado-Passler, 2005; Flanagan, 2009; Hannan, 2012; Czarnecki, Murphy Garwood, & Weisman, 2007).

Evidence related to the APN role include: (a) APNs provide improved continuity of care for patient and family, (b) APNs provide effective and efficient care, and (c) APNs are uniquely positioned and can coordinate care, provide orders, manage medications, provide expert

communication, have expert assessment skills, and make follow-up appointments, and (d) APNs provide support and reassurance for patients and caregivers.

Evidence for the process of telephone follow-up: (a) can reduce health care costs, (b) can reduce medication errors after discharge, (c) can reduce readmissions, (d) can improve outcomes for patients, (e) improves communication, (f) improves patients recall on education received in hospital regarding plan of care, and (g) patients progress faster after discharge with help available.

It is clearly in the best interest of the patient to provide postoperative pain coaching using a telephone follow-up program. It is also clear there is a large research gap. Key points noted while reading the literature include: having a clear plan, a concise measurement tool, schedule pain coaching at peak periods of postoperative pain, and pain coaching provided by advanced practice nurses can provide the best management. The literature reviewed noted a lack of the appropriate measurement tools and the need for the development of one. However, for this EBP project, a standardized questionnaire and a standardized intervention list was created. Knowing that pain peaks on day three for most, it was important to contact the patient on or before that day if the patient had already gone home.

It is the goal of this EBP project to measure the effect of telephone follow-up on reported pain by knee replacement patients, compared to usual care, over a 4-week period.

Table 2.1

Levels of Evidence from the Appraisal of Literature

Author(s)	Level of evidence	Key evidence related to the EBP project
Mistiaen and Poot (2008)	Level I Cochrane Review	Two authors originally assessed 340 full text citations against the inclusion criteria. Thirty-three articles were reviewed. Review found positive patient feedback and a lack of negative evidence to exclude the process. The review highlights the need for "clear detailed descriptions of the strategies in both the intervention and control arms". There is a need for large-scale research to verify what the patients already know about follow-up telephone calls.
Kimman, Bloebaum, Dirksen, Houben, and Lambin (2010)	Level II Randomized Controlled Trial	Patient satisfaction with nurse-led telephone follow-up was evaluated with an n=299. The conclusion noted that patients were equally as satisfied with telephone follow-up as with an office visit follow-up. This study was completed for a 12 month period.
Beaver et al. (2009)	Level II Random Controlled Trial	This RCT included 374 patients over a 24-month trial. Telephone follow-up was utilized in the intervention group compared to hospital follow-up. Telephone follow-up was well received by patients and reported greater satisfaction and obtained the same information that an office visit would have produced.
Hannan (2012)	Level II Randomized Controlled Trial	This was a small study of n=69 with significant results. Study aim was to examine the effects of an APN telephone follow-up intervention over a two-month period post discharge on first time mothers. This study had very positive results for infant, mother, and was cost-effective by saving health care charges.
Inman, Maxson, Johnson, Myers, and Holland (2011)	Level II Randomized Controlled Trial	Telephone follow-up for postoperative education to manage home care with an n=60. The authors concluded that telephone follow-up with patients can increase their ability to care for themselves once home. The telephone intervention is easily tailored to the individual patient. Patients were well satisfied and reported a reduction in the need to seek out other resources.

Ouellet, Hodgins, Pond, Knorr, Geldart (2003)	Level II Randomized Controlled Trial	Pilot study of 53 participants was initiated using telephone follow-up as the intervention. This pilot study was developed due to the increasing trend of shorter stays after surgery. The results of the pilot study revealed: a clear goal should be identified, when completing the calls a protocol should be identified, sufficient time needs to be allowed, and the nurse calling needs expert skills. The authors utilized the information gained from the pilot to make changes before moving forward with a larger study.
Pfeil et al. (2007)	Level II Randomized Controlled Trial	Authors compared a follow-up telephone call intervention to visiting nurse after a next day discharge. The sample was n=56 children who had an appendectomy. Had positive feedback regarding nursing intervention whether in person or via telephone.
Hodgins, Ouellet, Pond, Knorr, and Geldart (2008)	Level II Randomized Controlled Trial	Telephone follow-up on orthopedic surgery recovery with an n=438. The authors noted patients are assuming responsibility for their care at home much earlier now and need to be equipped to care for themselves. Results indicated more than 40% of the participants had problems postoperatively. The intervention did not show statistically significant outcomes; the results did demonstrate reasons to continue the research in this area. Standardized measures are needed to promote the synthesis of the findings. There is extreme variability in this area of research.
McGinley and Lucas (2006)	Level IV Cohort	Telenursing pilot study with an n=30. The intervention of telephone follow-up was being utilized to reduce the number of patients needing follow up appointment. A secondary benefit was to reduce the waiting time for appointments. Outcomes were positive.

Czarnecki, Murphy Garwood, and Weisman (2007)	Level IV Cohort	This study addressed acute pain following discharge after spine surgery. The intervention was APN telephone follow-up with an n=61. Results indicated APN follow-up was effective, efficient, and provided continuity of care for the patient and family.
Harrison, Hara, Pope, Young, and Rula (2011)	Level IV	Telephone follow-up was considered in relation to hospital readmissions. The results demonstrated positive effects. Providing a timely telephone follow-up provided an effective option and can impact readmission rates which subsequently impacts healthcare costs.
Flanagan (2009)	Level VI Qualitative Convenience Sample	Flanagan's question in this study was based on the postoperative telephone call and the timing of the call. The sample of n-77 was a convenience sample. Preoperative education was provided as was postoperative at the time of discharge. However the authors note that most of healthcare has become an outpatient field and that nursing has remained inpatient. Patients are discharged and experienced a need for nurse coaching once home.
Delgado-Passler (2005)	Level VII Literature Review	Delgado-Passler conducted a literature review of four studies with over 2000 participants. The intended focus was the influence of nurse practitioners on post-discharge management. Important points included: APNs were in a position to improve the quality of life of the patients they discharged, to reduce the cost of rehospitalization, to reduce the burden on families, and to manage comprehensive patients at discharge.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

The focus of this EBP project was to implement a follow-up telephone intervention to assess the effectiveness of pain control on post-operative knee replacement patients after discharge for the first four weeks. Traditionally, the standard of practice for length of stay for joint replacement was three to five days. Today, the standard of practice for length of stay is 24 to 48 hours. According to the evidence found in the literature, the severity of the pain after joint replacement surgery in most patients peaks after three to five days **(**Akyol, Karayurt, & Salmond, 2009). The patient is home before the peak of pain has occurred. This EBP project was developed in an effort to address the unmet pain needs of post-operative patients. This chapter will outline the process by which this EBP project was completed and evaluated.

Setting and Sample

This EBP project was conducted at an orthopedic clinic in Northwest Indiana. The clinic has four locations, five physicians, and two nurse practitioners. The project coordinator is employed by the clinic. The participating hospital is a 227-bed, acute-care, full-service hospital in the northwest Indiana area. This facility is non-profit, part of a statewide organization, and is Magnet recognized. Although this facility is part of a larger statewide organization, it is still managed independently by an executive team and administrative board.

In this EBP project, participants included patients who were completing a total knee replacement for the first time, were at least 21 years of age, and were willing to participate. Criteria that excluded participation in this EBP project included: any participant residing in a long-term care facility, any patient with cognitive deficits, and any patient unable to read or write English.

Outcomes

The review of relevant evidence indicated that patients verbalized appreciation for the follow-up calls. Follow up calls can reduce readmissions and emergency room visits, improve rehabilitation ability, and reduce discharge complications. The goal of this EBP project was to

provide additional contact between the providers and the patient. This contact was intended to bridge the gap between patients receiving seven days of inpatient care and those receiving 24 to 48 hours of inpatient care with early discharge to home. The project coordinator provided weekly telephone follow-up. Each week for four weeks, the project coordinator called to "coach" the patients on their progress, answer questions, and address concerns. It was anticipated that participants in the intervention group would report less pain when receiving the telephone follow-up for pain coaching when compared to the usual care group. It was desired that secondary benefits would include reports of reduced anxiety and an overall improvement in the experience of knee replacement.

Intervention

The pain-coaching questionnaire utilized in the intervention group and usual care group were utilized to measure the effectiveness of the EBP project and included open-ended questions regarding additional benefits of participation in the pilot study. The project coordinator completed implementation of the intervention to maintain consistency and reliability of the process. The data collection period was open from September 1, 2013 through February 28, 2014.

The intervention was a telephone follow-up call, in which pain coaching was provided. The project coordinator completed the intervention during non-working hours. There was no financial commitment for the facility or clinic for this project. The patients and/or caregiver agreed and gave informed consent to participate in the project. Volunteers were randomly assigned to the usual care or the intervention group without knowledge of assignment. Participants in both the intervention group and the usual care group received a telephone call by the clinic registered nurse the day after surgery, which is the standard current practice.

The intervention process included telephone contact by the project coordinator each Thursday for the first four weeks. Contact was attempted at least three separate times on Thursday. If the patient was unavailable then, an attempt was made on Friday to reach the patient. At the end of the four-week period a completion telephone follow-up was made. Each of the telephone follow-up calls included the use of a standard questionnaire and a review of the interventions being utilized. The standard questionnaire was utilized to assess the patients'

concerns, pain levels, medication use, and alternative intervention use. The follow-up phone call also included a plan for the next telephone follow-up. Participants were made aware prior to participation and reminded at follow-up appointments that medication adjustments would occur during follow-up appointments at the clinic and were not completed as part of this EBP project.

Participation for the usual care group included a telephone follow-up by the project coordinator at the completion of the first four weeks post-operatively. At the time of this call, a standard questionnaire was completed. The project coordinator was focused on pain experienced, use of pain medication, non-medication interventions utilized, and any concerns experienced over the first four weeks post-operatively by the patient. The standard questionnaire and the intervention list were developed by the project coordinator and are attached as appendices (see Appendices A and B). The intervention list included the use of ice, elevation, range of motion, and the use of a CPM machine.

Planning

Planning began early to accommodate IRB committee requirements at the health care facility where the EBP project was taking place. Approval was obtained from Valparaiso University as well as the clinical facility in July. The project coordinator met with the APN council and the IRB committee for approval of all instruments that were utilized in this EBP project. The project was reviewed with the APN council and the IRB committee upon completion.

Meetings occurred with the office manager and the practice manager of the orthopedic clinic to review the project. The EBP project was approved as planned. Monthly practice meetings occurred and the EBP project was reviewed with other providers for input and questions. Permission was received to continue the planned implementation as of 9-15-2013.

Recruiting Participants

Once patients made the decision to plan total knee replacement surgery, the physician signed consent forms with the patients in the office. During data collection, the surgery scheduler met with the patient to set the dates for surgery and to set up appointments for the pre-surgical assessment. Next, the RN reviewed the EBP consent form (Appendix C) with the patients. When the first two participants were in place, a coin was flipped to initiate the random assignment.

Participants were patients scheduling knee replacement surgery for the first time, who were over the age of 21, who did not live in a long-term care facility, who had no cognitive deficits, and who were able to read and write English.

Data

Collection, Reliability, Validity, Management and Analysis

Data collection occurred with each weekly phone call to participants in the intervention group. A standardized questionnaire (Appendix A) was used and completed by the project coordinator on each participant for consistency. The usual care group received a phone call at the end of the 4-week postoperative period from the project coordinator. The standardized questionnaire was utilized for this call as well. This allowed for consistency throughout the data collection period.

Data was maintained in a secure location at the clinic in a locked office. There was no identifying information on the files. Each participant was given a number by which they were identified throughout the EBP project and the data presentation process. Each participant had a folder with the identifying number placed on the outside and on the questionnaire forms. The number associated with the identity of the patient was a code of their identity made known only to the project coordinator.

The intervention group received telephone calls once weekly for four weeks. The telephone follow-up included: use of the standardized questionnaire and intervention review for pain coaching. At this time pain was assessed using the Likert scale, which was part of the standardized questionnaire. At the end of the 4-week period, both the intervention group and the usual care group received a telephone follow-up call. They also completed the standardized questionnaire and assessed overall level of pain for the first four-week post-operative period. Analysis of the data took place at the end of the collection period. The SPSS-18 Seventh Edition Statistics program was used to complete a comparative analysis of the data obtained.

Protection of Human Subjects

In preparation for the completion of this EBP project, a certificate was obtained for “Protecting Human Research Participants” by the National Institute of Health. This was completed

3-29-2013 and was presented with the IRB packets to Valparaiso University and to the clinical site. The privacy of the participants was ensured for their protection by keeping all information locked in a desk behind a locked office door. Patient records were coded to maintain privacy. The code was kept private and was known only to the project coordinator.

CHAPTER 4

FINDINGS

The purpose of this EBP project was to determine the effect of telephone follow-up completed by an APN on the pain experienced by total knee replacement patients in the first four weeks after discharge from the hospital. There were also secondary outcomes anticipated which included: reduced anxiety, increased satisfaction, and decreased time needed to return to a normal level of activity. The telephone follow-up with pain coaching did have a significant positive effect on the patient's pain experience. The outcomes identified will be reviewed in this chapter.

Participant Characteristics

The following section will provide descriptive information on participants. The participants will be described collectively as a whole and individually as part of the Intervention and Usual Care groups.

Size. The project commenced with a total of 28 participants among the Intervention and Usual Care Groups. Due to attrition, the final project analysis was based on 25 participants. Three participants were lost from the Intervention group by the end of the collection period. Two participants returned to the hospital and one participant completed only three weeks of follow-up telephone calls. The final analysis was completed on 14 Usual Care participants and 11 Intervention group participants. With the participation of n=28 and a reduction of participants by n=3, there is an attrition rate of 16% and a participation rate of 86%.

Demographics. The participants in both the Intervention and the Usual Care groups completed their surgeries at the same Indiana hospital. Patients received follow-up by orthopedic providers who are part of one practice in Indiana. Follow-up appointments may have been completed in different offices. Patient participants all lived in the surrounding area of the Indiana offices. Participant surgeon choice for the overall total group was divided at 13 for one surgeon and 12 for the other.

Age of the participants ranged from 41 to 88 with the median age being 65. Participants were almost equally divided by sex with 13 females and 12 males. The Intervention group participants consisted of five females and six males, with ages ranging from 58 to 79.

Outcomes

Statistical testing. Using the SPSS Statistics 7th Edition program, the data was entered without any identifying information of the participants and was also password protected. The data was analyzed first to answer the PICOT question.

The variable of pain was measured for the Intervention and Usual Care groups. Pain was measured on a 0 to 10 scale for both groups, with 0 being no pain and 10 being the worst pain. An independent-sample *t* test comparing the mean scores of the Intervention and Usual Care groups found a significant difference between the means of the two groups (t (23)=-2.578, p < .05). The mean of the Intervention group was significantly lower (m = 2.5455, sd = 1.50756) than the mean of the Usual Care group (m = 4.0714, sd = 1.43925). The PICOT question, "In patients recovering from total knee replacement surgery, what is the effect of post discharge follow-up telephone calls on reported pain, compared to usual care, over a 4 week period?" was answered. Pain reported by patients receiving post discharge telephone follow-up calls for the first four weeks was significantly decreased.

Pain scores were collected for all participants of the Intervention group each week. The pain scores for each week were calculated to compare the means and there was a significant difference between week one and week four (see Table 4.1). Paired-sample *t* tests were completed between weeks post discharge to assess for differences. The results of all comparisons were significant for differences between the groups. The value of this is to show that there was a significant difference in pain from week to week and not just between the patients in the Intervention group and the patients in the Usual Care group. The results can be found in Table 4.3.

Weekly telephone follow-up phone calls allowed for the collection of patient concerns. Table 4.2 identifies the most prevalent concerns by the participants. The follow-up telephone calls allowed the project coordinator to provide pain coaching and education on bowel health, edema and nausea prevention and management, and the appropriate referrals when necessary.

Table 4.1

Mean Pain Score by Week for Intervention Group

Pain Scores	Mean Score
Week One	6.091
Week Two	4.000
Week Three	3.909
Week Four	2.909

Mean Pain Score by Week for Usual Care Group

Pain Score	Mean Score
Week Four	4.0714

Table 4.2

Participant Concerns (n=11)

Week	Wk1	Wk2	Wk3	Wk4
Participant %	n (%)	n (%)	n (%)	n (%)
Pain	2 (18)	4 (36)	1 (9)	3 (27)
Bowels	4 (36)	2 (18)	3 (27)	1 (9)
Nausea	1 (9)			
Edema	1 (9)	1 (9)	1 (9)	
Other	4 (36)	2 (18)	1 (9)	1 (9)
None	1 (9)	2 (18)	5 (45)	6 (54)

Other- therapy, dressing, On Q Pump, lab orders, immobilizer

Table 4.3

Paired Sample t Tests

Wk 1 to Wk 2 Mean Wk 1 - 6.09, sd 2.07 Mean Wk 2 - 4.00, sd **=**1.79

A significant decrease in pain from wk 1 to wk 2 was found

(*t*(10)=3.348, *p* <.007)

Wk 1 to Wk 3 Mean Wk 1 – 6.09, sd 2.07 Mean Wk 3 – 3.91, sd =.83121

A significant decrease in pain from wk 1 to wk 2 was found

(*t*(10)=2.963, *p* <.014)

Wk 1 to Wk 4 Mean Wk 1 – 6.09, sd 2.07 Mean Wk 4 – 2.91, sd=1.37510

A significant decrease in pain from wk 1 to wk 4 was found

(*t*(10)=5.590, *p* <.000)

Secondary outcomes. Using a Likert scale to rate the calls from very helpful to not helpful at all on week five, 88% or 22 of the 25 participants found the telephone follow-up calls either very helpful or helpful. Although anxiety and satisfaction were not directly measured, the feeling of the telephone calls being very helpful or helpful indicated a positive effect on both areas. A reduction in anxiety, improved satisfaction, and early return to previous activity level were hypothetical secondary outcomes that were not explicitly supported by the data. While conducting the follow-up telephone calls for the Intervention group, actual secondary outcomes were identified and addressed.

Some additional important issues were found during data analysis. Two patients (18%) were discharged without the appropriate orders to monitor their anticoagulant medication. Therapy was not assigned upon discharge on two patients (18%). Two patients (18%) continued to use a leg immobilizer after discharge, which is a temporary measure used in the hospital due to numbness in the affected limb after surgery. One patient was discharged with an On-Q pump in place and no instructions on removal or teaching on removal once home. An On-Q Pump is placed by the anesthesiologist in the operating room, subcutaneously in the patient's thigh to provide pain relief for the first 72 hours. A small tube with a pressurized bulb on the end is then taped in place. Usually it is removed before discharge or the patient is provided education prior to discharge to remove on day three after surgery. Patient dressings are checked before discharge to ensure they are clean and dry. One patient was discharged with a dressing that was saturated with blood and had not been removed or checked prior to discharge. A total of seven patients (63%) out of the Intervention group had concerns upon discharge that were addressed by the project coordinator.

CHAPTER 5

DISCUSSION

EXPLANATION OF FINDINGS

This EBP project was completed to determine the effect of telephone follow-up completed by an APN on pain experienced by patients with knee replacement in the first four weeks after discharge. In this chapter, key results as well as secondary and unexpected outcomes will be explained in terms of significance and how they compare to the existing evidence in the literature. The applicability of Orem's Theory of Self-Care Deficit and the Stetler model as the guiding theoretical and EBP frame works will be evaluated. The impact of the strengths and weaknesses of the project will be discussed. This chapter will conclude with an explanation of how this project's outcomes can impact the future of post-operative knee replacement pain perception.

The patients in the Intervention group experienced statistically less pain compared to the patients in the Usual Care group. An independent-sample *t* test comparing the mean scores of the Intervention and Usual Care groups found a significant difference between the means of the two groups (t (23)=-2.578, $p < .05$). The mean of the Intervention group was significantly lower (m = 2.5455, sd = 1.50756) than the mean of the Usual Care group (m = 4.0714, sd = 1.43925). Using a pain scale of zero, or no pain to ten, or pain at its absolute worst, the mean difference between the two groups was 1.5259. The means difference was 1.5, which meant the Intervention group experienced less pain.

The EBP project included APN involvement, telephone follow-up, and pain coaching. Comparing evidence in the literature with the results of this EBP project proved to be a challenge due to inconsistencies among the literature itself. A review of the literature prior to completing the project identified studies with varying methods of telephone follow-up and interventions and included many different disciplines such as cardiovascular, neurology, urology, oncology, and pediatrics specialties. Positive responses from patient participants were found in the majority of the literature, but these studies often lacked measurable outcomes that would identify follow-up telephone calls as having significant effects (Flanagan, 2009; Delgado-Passler, 2005; Mistiaen &

Poot, 2008). This gap in the literature revealed a need for improved studies with more rigorous measurement tools to clearly identify the improved outcomes from APN telephone follow-up.

When reviewing the research prior to this EBP project, patient satisfaction improved with telephone follow-up. But this intervention is thought of as intangible care according to Inman, Maxson, Johnson, Myers, and Holland (2011). In 2008, Hodgins, Ouellet, Pond, Knorr, and Geldart agreed that telephone follow-up calls made to patients were noted to be very helpful by patients, yet they lacked statistical significance. The researchers noted that studies needed to continue because patients were caring for themselves much earlier at home. They also noted that the research needed a focus that was measureable. Consistent with the literature, 88% of the total participants in both the Intervention group and the Usual Care group in this EBP project felt that the telephone follow-up was helpful or very helpful on the questionnaire. Assessing pain levels allowed outcomes to be measured in a way that demonstrated a positive or negative impact from the APN-led follow-up telephone calls. As mentioned previously, a significant positive outcome on post discharge pain assessment was identified for the Intervention group as compared to the Usual Care group.

Each telephone call was an opportunity to provide pain coaching and to assist patients with any other concerns. Thus, the calls provided an opportunity to better understand the needs of this population after discharge and allowed for secondary outcomes to emerge. Secondary outcomes included postoperative symptoms as well as unmet discharge needs.

An open-ended question was asked by the APN during each follow-up phone call regarding any other complications or concerns the patient may be experiencing. The top concerns or symptoms addressed during the telephone follow-up intervention included: pain, bowel/constipation, edema, and nausea. Education was provided to patients on addressing these symptoms and when more care was needed, an appointment was made for the patient to see the provider. These outcomes are consistent with the literature reviewed prior to the project's implementation.

The hospital discharge process was a concern for nursing staff that was noted in the literature and was consistent with the findings in this EBP project. Pfeil, Mathur, Singh, Morris,

Green, and Kulkarni (2007) identified that patients' pain experiences once discharged were compounded by the fact that the discharge process did not adequately prepare the patients or the caregivers for what to expect and how to address the pain. Hodgins et al. (2008) also discussed that pain, bowels, and edema are predictable outcomes of surgery and should be manageable with better discharge processes. Research by Czarnecki and Murphy Garwood (2007) suggested a more holistic approach by preplanning pain management prior to surgery in an effort to make the patient more aware prior to discharge.

While completing this EBP project, there were a number of significant discharge concerns that were unexpected. After discharge, the APN had to address potentially significant complications while completing the telephone follow-up calls that included: physical therapy orders, dressing change education, activity guidelines including removal of leg immobilizer, and coordination of laboratory orders for anticoagulant therapy. For the knee replacement patient, care after discharge affects the rehabilitation outcome. Routine discharge for a knee replacement involves a continuation of therapy starting the next day with outpatient therapy or at-home therapy. Immediately following surgery, some patients complete therapy using an immobilizer due to numbness felt after a nerve block. Patients who were discharged home continued to use their leg immobilizer, which opposed the effect of therapy after the knee replacement and potentially negatively affected the outcome of the surgery.

Knee replacement patients can be discharged on Warfarin/Coumadin, Xarelto, or Aspirin to prevent blood clots. Patients on Warfarin/Coumadin require laboratory tests two times a week to monitor the effects of the medication. Warfarin/Coumadin doses that are too high place the patient at risk of bleeding. If the dose is too low, the risk to the patient is that blood clots may form and can compromise circulation. These concerns were addressed at the time of the follow-up phone calls and were important unexpected findings for the patients.

One of the most important areas after a knee replacement is prevention of infection. Part of the secondary findings included teaching a family member to remove a surgical dressing that was saturated. This patient would not have seen a provider for four more days which would have placed the patient at risk for infection. An infection can lead to another expensive hospital

admission, the need for several weeks worth of antibiotics, the need for additional surgery, the possibility of sepsis, or even death.

The overall findings provided support that APN-led postoperative discharge telephone calls not only positively influenced postoperative knee replacement pain, but also allowed for important education regarding the discharge concerns of the patients once they were home. The secondary findings identified upon completion of the questionnaires were found to be valuable in both the Intervention and Usual Care groups. The information gained regarding the discharge process provided insight into the need for continued education for all healthcare professionals about the importance of a consistent and comprehensive discharge process. Further research as to how to improve this process in a way to benefit the patient is needed.

Evaluation of the Project: The Stetler Model

The Stetler Model of Research Utilization was used as a framework for this EBP project. The Stetler model has five phases: preparation, validation, comparative, evaluation/decision-making, translation/application, and evaluation (Stetler, 2001). The preparation phase involved identifying a problem and the development of the PICOT question used in this EBP project. Phase one included a relevant literature search for evidence related to the clinical question. When reviewing the literature, Stetler considers external evidence as research findings or national experts and internal evidence as other sources of credible information, which includes patient preference. Patient preference was utilized in this EBP project. Patients had the choice to participate, the choice of therapy location, and some chose their own pain medication. Data was collected regarding the location of therapy and the type of pain medication in use.

Phase One also includes external factors such as, “politics, imposed deadlines, or prioritized goals of the organization” (Stetler, 2001, p. 275) or personal factors or beliefs that can affect objectivity. Clinician questions have significant patient importance but may not always be a political or organizational priority, and they should be aware of deadlines that may affect the project. Before proceeding with the EBP project, timelines were considered regarding IRB approval for both Valparaiso University and the clinical site. For this EBP project, the clinical site IRB committee only met quarterly. This meant that the University IRB had to be completed very

quickly to proceed to the clinical site IRB committee, which met in July. The timing could have delayed the intervention time frame planned for the EBP project.

An internal factor was the project coordinator's personal belief in the need for telephone-follow-up. It was important to adhere to the questionnaire with each call and not let personal beliefs direct the process of the call, which could have biased the evidence being collected. Enthusiasm from the clinic manager and the practice manager for the project allowed the office RN to obtain participants' consents at the time of surgery testing. Being unable to obtain the clinic staff's acceptance of the EBP project would have been an obstacle to project implementation.

Phase two was the validation step. In 2001, Stetler redefined this as the phase of utilization-focused reviews. Like Stetler's tables, the literature search for this EBP project included an evaluation of the research findings, not the articles themselves. To complete this phase, the project coordinator identified research on follow-up phone calls with very positive outcomes from patients such increased satisfaction and decrease in anxiety. However, review of the literature also identified a need for further telephone follow-up interventions by APNs. Literature reviewed indicated positive outcomes but did not have adequate ways to measure those outcomes. Using the pain scale of 0-10 in the telephone follow-up calls provided a measurable scale that allowed the intervention by the APN to be quantified in this EBP project.

Phase three, or the comparative phase, was the time to evaluate the evidence, assess the appropriateness of the clinic setting, and determine the appropriateness of moving forward with the project. The original goal was set at 40 to 50 participants. It quickly became apparent that those numbers were too high and would have to be adjusted. The telephone follow-up was to be completed by the project coordinator and that many participants over a 12 to 18 week period would have been to difficult to complete. An alternative that was considered was having a second person to complete the calls, but that decision may have decreased the validity of the results. Another option was to continue the project into February since the IRB approval for the project was through February 28th. However, this would have not allowed enough time to complete the project in a timely manner. The end result was moving forward with a smaller sample size.

Phase four of the model involved planning or implementation. After reviewing all the literature, it was clear that a concise, and measurable tool was needed to validate the use of telephone follow-up by the APN. In 2008, a Cochrane Review by Mistiaen & Poot assessed 33 studies involving telephone follow-up, and they concluded that studies did not prove statistically in favor of the control group, yet the patients valued the calls. Also noted by these authors is the lack of a consistent tool to measure the positive effect of the APN call and the variability between all the types of studies or a lack of replication. Hodgins et al. (2008) also indicated a lack of statistically significant results with study participants rating the calls as helpful. Again, this indicated a need for new measuring tools that are explicit to show the importance of the calls and continued research. Czarnecki et al. (2007) completed a retrospective study of APN telephone follow-up and pain management. This study was successful and was expanded in the hospital where it was initiated. It should be noted that the focus was pain. Many of the other studies were attempting to measure the importance of the call itself. Part of the Stetler model is translating the evidence into an achievable plan.

The evaluation phase, or phase five, is when the PICOT question is answered. For this EBP project, the PICOT question was, “What is the affect of telephone follow-up completed by an APN on pain experienced by knee replacement patients in the first four weeks after discharge?” Patient satisfaction with the telephone follow-up was positive in 22 of 25 participants, which was consistent with the literature. The consequence of the health care environment today is reduced length of stays for patients. Early discharge places the patients at home and caring for themselves while dealing with pain, constipation, nausea, and edema. Pain is the main concern when discharged (Hodgins et al., 2008). Assessing pain with each questionnaire provided a measureable way to evaluate the Intervention group and Usual Care group. There was a significant effect (t (23)=-2.578, $p < .05$).

The Stetler model was well suited for this project because it provided a step-by-step guide, or prescriptive approach, for clinicians or nurses to integrate research into practice at the bedside (Stetler, 2001). One of the strengths of the model was that it was beneficial as a guide when beginning the project and reviewing the literature, because it provided the outline for the

preparation of the project. This provided needed assistance to the project coordinator who, as a novice to the process, was able to continue the steps that led to implementation, evaluation, and a practice change. A weakness of the model is that some of the phases, such as Phase IV and Phase V, overlap and can cause confusion. Although the model provides step-by-step guidance, it can be difficult to understand to the novice researcher.

Evaluation of the Project: Orem's Theory of Self-Care Deficit

Orem (1995) stated that the basic tenets of the self-care theory are that self-care is a requirement that either must be performed by or for individuals in order to maintain life. Orem's theory addresses the interrelationships between nursing, patients, and patients' self-care needs that include inherent responsibilities for both nurses and patients. Deficits occur when individuals are unable to care for themselves. Nurses are in a position to identify those deficits and provide aid to those individuals. Orem's theory is seen as three theories in one: expressions of a theory of self-care, theory of self-deficit, and theory of nursing system.

Orem's theory was well-suited for this EBP project because each patient was maintaining the process of self-care prior to hospital admission. The knee replacement patient chooses to place himself in a self-deficit role and agrees to accept human assistance from the nursing system. The nursing role is temporary and the patient's plan is to return to the expression of the theory of self-care. By providing telephone follow-up calls, the project coordinator fulfilled the nursing system role by helping the patient to return the self-care role.

Orem (1995) identified six components to consider when engaging in self-care: physician's perspective of the health situation, patient's perspective, patient's state of health, health results sought, the self-care demand, and current abilities/disabilities for self-care of the patient. Using the Orem model from a nursing focus allowed the project coordinator to consider all six perspectives when providing pain coaching during the telephone follow-up calls.

Upon completion of the project, the evaluation of the process took place. This was where the project coordinator began to see areas that needed to be changed. First, patients were doing significantly better by week three and would not need calls at four weeks. Patients would benefit from calls the day they got home or the morning after and then for the three subsequent Fridays

after discharge. By calling on Friday, the provider would know the patients had what they needed for the weekend when they would have been unable to contact the provider. Also, every patient that signs the consent should be given a pain score sheet with a place to keep a record of a score on the three consecutive Fridays following surgery and the day they arrived home. This allowed for weekly comparisons of the Usual Care and Intervention groups. The goal would be for a study with a larger sample size to allow for statistically significant results.

One of Orem's main strengths is that her model is applicable to all settings including: research, education, administration, and clinical. A second strength is that all levels of nursing can use the theory from beginners to experienced clinicians, and advocates using the nursing process. Weaknesses regarding the Orem model include that it focuses mainly on the individual when there are other factors to consider such as family, environment, and community. The model also addresses mainly physical needs and less on psychological needs which should also be addressed.

Strengths and Weaknesses of the EBP Project

One of the strengths of this EBP project was the choice of utilizing the intervention of APN telephone follow-up to measure or assess pain. There was an abundance of literature that included APN telephone follow-up. In these studies, the effect of the call was being measured. The studies are being completed to try and validate the importance of the APN telephone follow-up by showing a measureable effect that is significant. This EBP project can easily be replicated on a larger scale and contribute to the body of nursing knowledge.

The most important strength is that the intervention is being adopted to fill a need among the patients. Pain and reduced length-of-stay can negatively affect patients' recoveries. If a telephone call can benefit the patients and their recovery times, then this is a significant strength of the project.

One weakness of the project would be the sample size. The original goal of 40 to 50 participants was hampered by time constraints. Obtaining IRB approval took longer than expected and the actual project and data collection did not start until the end of September. The IRB dates allowed for collection through February 28, 2014; however, this would have

complicated completion of the project. It also became difficult to manage all the calls as the participants began to add up in the months of November and December. The project began with 28 patients enrolled. Three patients did not complete the project. Two patients were lost due to medical complications and one patient was unavailable for the last two follow-up calls. The final sample was size was 25.

Another weakness was that the Usual Care group was not asked to report pain scores for all four weeks. This would have made the study that much more significant. This was an oversight by the project coordinator. If the project were repeated, this would be changed.

Future Implications

Practice

The APN is the expert in the field of nursing. The role of the APN is to participate in the care and management of patients and to influence the process of health care through the use of research and evidenced-based practice. This EBP project was a part of that process. If this project were to be replicated on a larger scale, it could contribute to the body of knowledge and make a difference for patients who are discharged early. The change process in health care happens in small steps.

The literature reviewed called for repeated studies on larger scales with rigorous tools to prove the value of the APN telephone intervention. The literature demonstrated that patients value the intervention. The impetus is on researchers to find a way to statistically measure that value.

The APN is well equipped to provide the support needed for patients discharged home after surgery. Pain is the number one complaint from these early-discharged surgical patients. APNs can address pain, constipation, nausea, edema, and any other concerns the patient may have. A study completed by Czarnecki et al. (2007) not only reported patient satisfaction, but found telephone follow-up to manage postoperative pain to be both efficient and effective. The study was so effective, a practice change was put into place.

Theory

Theory is a term used to define a collection of ideas to explain a belief or a phenomena. In science, theory is a more exact term such as the theory of relativity. For this EBP project, it served as the framework for the project. Each step provided the novice the knowledge needed to complete that phase and move forward.

Orem's Self-Care Deficit theory provided the guideline for the nursing and patient interaction. There are many transitions a patient faces when losing independence whether it is permanent or temporary. This theory may be better suited for the nurse at the bedside; however, the project coordinator had contact with the patient pre and post surgery as well as in the hospital as she rounded for the physicians. This kind of contact made the Self Care Deficit Theory appropriate for the APN to use for this project.

Research

The Stetler Model of Utilization Review provided a prescriptive approach starting with the formulation of the "burning clinical question" and ending with the evaluation of the project. Prior to the EBP project, the review of the literature gave the project coordinator insight as to what gaps existed in the research and what had not been successful in the past. Evaluations of studies by its authors and peers lend insights that provide aid to future researchers. Evaluating the strengths and weaknesses of this project aided the project coordinator in determining ways that would improve the strength of this project for future research. A study by Flanagan (2009) noted that even though most of healthcare is living in an outpatient world, nursing has stayed inpatient. This EBP project fits into the need to adjust the patient care to the outpatient environment. Inman, Maxson, Johnson, Myers, & Holland (2011) noted that reduced length-of-stay may be placing the patient in charge of his/her own care much earlier than they may be ready for. Providing telephone follow-up three to five days after discharge increased patients recall on their care. This study was considered when choosing Friday as the day to follow up. Completing calls on Friday is also an implication for future research.

Education

This EBP project was a positive experience for both the patients and the APN. It provided a measureable way to show the effect that pain coaching and APN telephone follow-up calls can have on patient's pain levels. Orem's Self-Care Deficit theory helps nursing to address both physical and emotional needs of patients. The follow-up calls included pain coaching and addressed other concerns such as: constipation, nausea, edema, wound care, therapy, and poor appetite. The APN was able to provide the education the patient needed to successfully transition from the hospital to home. Interventions were reviewed with each call to address constipation and edema. Medications were reviewed for pain control. Patients and caregivers received wound care education when needed.

The Usual Care group received a phone call at the end of the four-week period to complete the questionnaire and address any questions or concerns. Educational opportunities continued even at four weeks post operatively. Patients were still experiencing pain and edema. Often asking questions regarding how long they should expect to see edema or when the pain would improve.

Conclusion

Knee replacements in the United States will continue to increase due to increasing numbers of an aging population. Healthcare professionals will be challenged to provide the best care in the most challenging circumstances as health care continues to become outpatient-focused. APNs are highly skilled and able to assist patients with the transition from hospital to home.

This EBP project set out to answer the PICOT question: What is the affect of telephone follow-up by an APN on pain experienced by knee replacement patients in the first 4-weeks after discharge? The effect was that the Intervention group had a reduction in pain compared to the Usual Care group. The results of the independent-sample *t* test comparing the mean scores of the Intervention and Usual Care groups revealed a significant difference between the means of the two groups (t (23)=-2.578, $p < .05$). The mean of the Intervention group was significantly lower (m = 2.5455, sd = 1.50756) than the mean of the Usual Care group (m = 4.0714, sd =

1.43925). This meant that patients receiving telephone follow-up from the APN reported lower levels of pain than those who did not receive extra phone calls.

Secondary outcomes included: patients had coaching addressing constipation, edema, nausea, and wound care. Follow-up appointments were scheduled by the APN for patients. The APN arranged office follow-up for medication concerns and equipment needs that may otherwise have gone unaddressed.

Unexpected findings were addressed by the APN during the telephone follow-ups. Labs were ordered for Warfarin/Coumadin monitoring. Therapy orders were written and forwarded for patients who failed to receive them at the time of discharge. The patients with wound care concerns were seen in the office on the next business day for assessment to ensure there was no infection present. The additional phone calls post-discharge allowed the APN to intervene in situations that could have resulted in negative patient outcomes.

It is clear from the literature that telephone follow-up after discharge is still a work in progress. Continued research on larger scales with very specific guidelines and measurement tools is needed. Studies need to be replicated across different populations to show the values of the APNs providing these interventions. APNs are able to use their expertise to assess the overall status of their patients' health and to educate and provide the appropriate care needed to ensure complication-free recoveries.

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BIOGRAPHICAL MATERIAL

Laurie J. Jones

Ms. Jones graduated from Purdue University North Central in 1993 with an Associate of Science in Nursing degree. Her career as a nurse began in a community hospital on medical-surgical and maternal child units. With a desire to continue her education, she completed her Bachelor of Science in Nursing degree at Valparaiso University in 1998. Her nursing career continued into the community working with developmentally disabled adults and hospice patients. In 2007, Ms. Jones returned to Purdue University Calumet where she completed her master's degree in nursing as a family nurse practitioner. She began her nurse practitioner career in 2010, certifying with both AANP and ANCC. She is a member of the AANP and Sigma Theta Tau International-Mu Omega Zeta Epsilon Chapter. After completing her educational experience at Indiana University Health La Porte, she accepted her current position in orthopedics. Working in orthopedics led Ms. Jones to her evidenced-based practice project in practice improvement in joint replacement care. Since health care today has become an outpatient process, Ms. Jones became aware that patient with joint replacements were going home with a need for increased follow-up or availability to communicate with the provider. She developed an evidenced-based project in an effort to improve outcomes for these patients. The project involved telephone follow-up with pain coaching. Ms. Jones has guest lectured at Purdue University Calumet for graduate level health assessment and at Purdue University North Central on women's bone health and osteoarthritis. Ms. Jones has an aspiration to give back to the nursing profession by entering into an educator's role in the future.

ACRONYM LIST

ADL: Activity of Daily Living

AF: Arthritis Foundation

AHRQ: Agency for Healthcare Research and Quality

AAHKS: American Academy of Hip and Knee Surgeons

AARP: American Association of Retired Persons

APA: American Psychological Association

APN: Advance Practice Nurse

CDC: Centers for Disease Control

CINAHL: Cumulative Index to Nursing and Allied Health

CPM: continuous passive motion

EBP: Evidence Based Practice

IRB: Institutional Review Board

JBI: Joanna Briggs Institute

NIH: National Institute of Health

PICOT: population, intervention, control, outcome, time

RCT: Randomized Controlled Trial

RN: Registered Nurse

Appendix A

EBP Pain Questionnaire

Patient Name: _____No. _____ Group _____
Surgeon _____Date of Surgery _____
Allergies:
_____
Pain Med Hospital_____
Pain Med Home _____
Therapy Where: _____ When: _____

1. How are you doing today?
   _____
2. Rate your pain 1 to 10: _____
3. Have you been taking your medication as prescribed? If not how are you taking them?
   _____
   _____
   _____
   _____
   _____
4. What other interventions have you been using? Ice _____ Elevation _____ ROM_____ CPM _____ Other _____
5. Other concerns? (bowels, sleep, rash, itching) _____
   _____
   _____
   _____
   _____

Recommendations for patient:
_____
_____
_____

Do you have any comments or questions before we complete this phone call? _____
_____
_____
_____
_____

How helpful was this phone call?

Very Helpful _____ Helpful _____ Neutral _____ Not Helpful _____ Not At All Helpful _____
Next Follow up call date: _____ AM _____ PM _____

Date: _____ Time Start: _____ Time Finish: _____

Appendix B

Pain Coaching Interventions

Orthopedic Intervention List for EBP project September 1, 2013 through February 28, 2013. (Interventions are part of routine Non-Pharmacological interventions utilized for both hip and knee replacement patients at I U La Porte Orthopedics)

Interventions

_____ Ice 30 Min. at a time over clothing with a 10 to 20 min rest period up to every two hours while awake for the first week.

_____ Elevation must be at the level of the heart or above to help with reduction in swelling.

_____ Ambulation should occur hourly while awake.

_____CPM Machine – Start at 60 degree and increase by 10 degree daily until you reach 120 degrees or the degree of flexion indicated by your therapist.

(**Medication adjustments may occur during routine follow-up appointments and calls to the office of I U Orthopedics. However medication adjustments are not part of this EBP Project and will not be addressed during telephone follow-up calls.)

Appendix C

Evidence-Based Practice Project
Laurie J. Jones, MSN, RN, FNP, BC

Study Title: The effects of telephone follow up by an APN on pain in patients who have had a total knee replacement and have been discharged home.

Project Coordinator: Laurie J. Jones, MSN, RN FNP BC

Purpose: I, _____, understand that I am being asked to participate in an evidenced-based practice project to measure the effect of telephone follow up by the nurse practitioner on my pain after knee replacement surgery.

Procedure: The Evidence-Based Practice Project Coordinator/DNP student will provide the following to participants: telephone follow up for the first 4 weeks after being discharged for a total knee replacement. The phone follow up will be completed using a standard questionnaire. The I U La Porte Hospital pain scale will be used to assess your level of pain. This project will not change in anyway the routine follow up that exists at I U La Porte Orthopedics currently. The data collection period for this intervention will take place from September 1, 2013 through February 29, 2014. Total knee replacement patients at I U La Porte Orthopedics offices in Michigan City, La Porte, Knox, and Plymouth offices will have the opportunity to participate in this project.

Risks: There are no physical or other known risks to those participating in this Evidence Based Practice project. There are no invasive techniques being utilized. This project is designed to assist the patient in pain control in the first 4 weeks at home after having a total knee replacement. The data evaluation collected on participants will be compared at the end of the project to determine the effectiveness of a telephone intervention.

Benefits: Participants in this project will receive pain control coaching from the nurse practitioner during follow up phone calls. It is expected to empower the patient and increase the patient's ability to manage their pain during the period immediately following total knee replacement. A secondary benefit may be faster return to previous activity level and increased satisfaction with the decision to have replacement surgery.

Voluntary participation/withdrawal: I understand that participating in this project is my choice, and I am free to stop at any time.

Appendix C

Page 2 EBP Consent

Questions: If I have any questions about being in the project now or in the future, Laurie Jones may be contacted at (219) 781-4622. If I have any questions about my rights as a research participant, Dr. Julie Brandy, Chair of the Institutional Review Board at Valparaiso University, may be contacted at 464-5289 or Dr. Clayton Alexander, Chairman of the Institutional Review Board at I U La Porte Hospital, may be contacted at 326-2363.

Confidentiality/anonymity: Although the information and answers I give may be used and reported by the project coordinator/DNP student, my name and other facts that would identify me will be kept strictly confidential. I understand that due to the nature of this project, the EBP project manager may choose to use my direct quotes when talking about the data. However, I have been assured of anonymity in the reporting of data.

Consent to participate in this EBP Project: I have read or had read to me all of the above information about the research study, the procedure, possible risks, and potential benefits to me, and I understand them. All of my questions have been answered. I give my consent freely, and offer to participate in this project.

_____ _____

Participant signature Date

_____

Project Coordinator/DNP Student