Patient Perceptions of Functional Abilities after Total Knee Arthroplasty

Stephanie A. Jones

Kennesaw State University

Follow this and additional works at: http://digitalcommons.kennesaw.edu/etd

Part of the Nursing Commons

Recommended Citation


This Thesis is brought to you for free and open access by DigitalCommons@Kennesaw State University. It has been accepted for inclusion in Dissertations, Theses and Capstone Projects by an authorized administrator of DigitalCommons@Kennesaw State University. For more information, please contact digitalcommons@kennesaw.edu.
PATIENT PERCEPTIONS OF FUNCTIONAL ABILITIES AFTER TOTAL KNEE ARTHROPLASTY

By
STEPHANIE A. JONES

A Thesis
Presented in Partial Fulfillment of Requirements for the
Degree of
Master’s in Nursing Science
In the
WellStar College of Health and Human Services
Kennesaw State University

Kennesaw, GA
2013
Thesis/Dissertation Defense Outcome

Name: Stephanie A. Jones

Program: MSN-Nursing Education Leadership

Title: Patient Perceptions of Functional Abilities after Total Knee Arthroplasty

Thesis/Dissertation Defense: [ ] Passed [ ] Failed Date: 11/25/2013

All courses required for the degree have been completed satisfactorily [ ] YES [ ] NO

Signatures

[Signature] 11/25/2013
Thesis/Dissertation Chair/Major Professor

[Signature] 11/25/2013
Committee Member

[Signature] Date
Committee Member

[Signature] Date
Committee Member

[Signature] Date
Committee Member

[Signature] Date
Program Director

[Signature] Date
Department Chair

[Signature] Date
Graduate Dean

Rev. 2/15/12
Acknowledgements

I would like to express sincere appreciation to Dr. Gloria Taylor as my thesis chair for her time and dedication in assisting me in conducting and writing my research. She has kept me focused and on task. I would also like to thank Dr. Jackie Jones, as my thesis co-chair, whose literary assistance has been invaluable.

I would also like to thank my mentors, Priscilla Stockwell, NP, and Susan Eldred, NP at Gwinnett Medical Center-Duluth. They have both been the epitome of role models and an example that all nurses should aspire to follow. Both of these ladies are admirable in all of their numerous accomplishments. They have reinforced my desires to expand my nursing knowledge and continue with pursuing higher education.

Lastly, I would like to thank my family and friends. My husband, Bill Jones, has endured all of the past years challenges and has championed me forward to completion. Without his love and support none of this would have been possible. My children, Andy, Lauren, and Meredith Jones have all endured the past year of education with me. Their sense of humor has helped to lighten the stress of obtaining my Master of Science in Nursing. Thank you to all of my friends and co-workers in helping me to further my education.
Abstract

**Purpose:** To identify if patients’ perceptions of their functional abilities prior to Total Knee Arthroplasty (TKA) were similar to their actual post-operative functional abilities at 4 to 6 weeks post-TKA if they attended an educational joint replacement class prior to surgery.

**Design:** One group, pre-test/post-test.

**Methods:** Data were obtained from 17 participants attending an educational joint replacement class in Georgia. Patients’ perceptions of functional abilities before and after TKA were identified using the Knee Outcome Survey Activities of Daily Living Scale (KOS-ADLS), Short Form 12 version 2 (SF-12 v2), and a demographics questionnaire.

**Results:** KOS-ADLS findings were statistically significant $2.32(7), p = 0.027$, SF-12 v2 physical health findings were not statistically significant ($t = 0.18, p = 0.865$) and SF-12 v2 mental health findings were not statistically significant ($t = 1.59, p = 0.157$).

**Conclusion:** The KOS-ADLS revealed improved change in knee symptoms and function over a 4-week period. However, SF-12 v2 did not make this determination. Future research should use a repeated measures design (8 and 12 weeks, and 6 months) and a specific instrument to measure the impact of the educational joint replacement class.

**Keywords:** total knee arthroplasty, functional abilities, perceptions, educational joint replacement class
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS .................................................................................................................. ii

ABSTRACT ....................................................................................................................................... iii

TABLE OF CONTENTS ................................................................................................................... iv

LIST OF TABLES ............................................................................................................................ v

CHAPTER 1: INTRODUCTION ................................................................................................ 1

CHAPTER 2: REVIEW OF THE LITERATURE ........................................................................... 9

CHAPTER 3: METHODS ............................................................................................................... 19

CHAPTER 4: RESULTS .................................................................................................................. 27

CHAPTER 5: DISCUSSION .......................................................................................................... 37

REFERENCES ................................................................................................................................. 46

APPENDIX A: Informed Consent ................................................................................................. 51

APPENDIX B: Demographic Questionnaire .................................................................................. 56

APPENDIX C: Knee Outcome Survey Activities of Daily Living Scale .................................. 59

APPENDIX D: Short Form 12 version 2 ..................................................................................... 61

APPENDIX E: Permission to use Knee Outcome Survey Activities of Daily Living Scale ........... 65

APPENDIX F: Short Form 12 version 2 Follow-up Questionnaire ........................................... 67

APPENDIX G: License agreement from Quality Metric .............................................................. 72

APPENDIX H: Gwinnett Medical Center Office of Research approval ..................................... 74

APPENDIX I: Institutional Review Board approval from Kennesaw State University ............... 76
LIST OF TABLES

Table 1: *Demographic Characteristics of TKA participants* ..........................................................30

Table 2: *Knee Outcome Survey Activities of Daily Living Scores* .............................................32

Table 3: *Knee Outcome Survey Activities of Daily Living Scores* .............................................33
  *Outlier Removed*

Table 4: *Short Form 12 version 2 Physical Health scores* .........................................................35

Table 5: *Short Form 12 version 2 Mental Health scores* ..............................................................36
CHAPTER 1: INTRODUCTION

Background and Need

Arthritis of the knee in the aging population is the primary source of disability in the United States (Centers for Disease Control and Prevention [CDC], 2009). Persons born between 1946 and 1964, known as the baby boom generation, are a population of approximately 47.5 million and are the individuals who are predominantly affected by arthritis (CDC, 2009). Arthritis has a profound impact on overall health and quality of life. The most common symptoms of arthritis include joint stiffness, pain, limited joint motion and deformity. Persons affected with arthritic pain have limited mobility, pain, and alterations in their ability to engage in self-care. These changes affect activities of daily living (ADL) in the way that patients are able to move their bodies and perform their usual daily activities. This contributes to a decreased desire to engage in tasks that require weight bearing because of pain, which ultimately affects a person’s ability to perform independent self-care. Additionally, gradual psychological changes occur from increasing mobility impairment. Psychological changes that affect patients’ mental health may cause feelings of fatigue or depression and can directly affect social functioning.

Not all persons require surgical intervention for control of knee pain, but for many individuals surgery is the only way to relieve pain. Many patients hesitate to have knee pain evaluated. The timing of joint arthroplasty surgery depends on many factors such as decreasing functional ability, x-ray findings, and failure to respond to conservative
treatments (Lavernia, D’Apuzzo, Rossi, & Lee, 2009). Many people seek alternative treatments for their chronic knee pain prior to choosing a surgical option. Nonsurgical treatments for total knee arthroplasty (TKA) consist of weight loss, exercise and physical therapy, medications, knee bracing, and possible knee injections of steroid or cartilage inducing medications. Surgical options include knee arthroscopy to remove affected cartilage, osteotomy that involves cutting of bone to realign the leg, or a partial knee replacement that replaces only one joint surface in the knee. Patients who fail conservative treatments for pain control or who experience increasing loss of function to the knee oftentimes seek TKA for symptom reduction and functional status improvement (Su, Tsai, Chen, & Chen, 2009).

Arthritic pain that severely affects mobility and social functioning is a powerful motivator for patients to seek evaluation of their knee pain. TKA is the most frequently performed arthroplasty in the United States (American Academy of Orthopaedic Surgeons, 2013). The goal of TKA surgery is pain relief, improved function in the knee joint, and improved quality of life (Martin, 2013).

The knee is a hinged joint between the upper leg bone (femur) and the lower leg bones (tibia and fibula). The surfaces between these bones become worn with age or arthritic changes, and the resulting damage causes pain and swelling. TKA is a procedure in which the surgeon removes arthritic damaged bone and cartilage in the knee and replaces these areas with artificial prostheses to the femur and tibia. The knee joint is completely replaced with artificial components since all of the diseased/damaged bone has been removed. The purpose of the procedure is two-fold: decrease pain and increase function in the affected knee. The demand for TKA is expected to grow 673% by the year
2030 as the American population ages (Kurtz, Ong, Lau, Mowat, & Halpern, 2007). Severe pain is the primary indication for TKA and pain reduction generally occurs within the first week after surgery (Nilsoflet, Toksvig-Larsen, & Roos, 2009).

TKA may be viewed by the prospective patient as a fearful but life changing surgery. This procedure has the potential to give mobility back to many patients who have become “trapped” by their own immobility. Because patients generally develop arthritis gradually, patients create many expectations regarding the benefits and advantages of having TKA. Perception is the patients’ reality. As arthritis progresses, the patient develops multiple strategies to increase comfort and mobility to decrease pain. Strategies continue to be used until the patient has made the commitment to have surgery. While TKA surgery is extremely successful, “achieving patient satisfaction may be dependent on managing expectations” (Hepinstall, Rutledge, Bornstein, Mazumdar, & Westrich, 2011, p. 873).

Surgical expectations may be better managed through education prior to surgery. Sullivan, et al. (2011) “has pointed to the role of presurgical expectancies as important determinants of TKA outcomes” (p. 2287). Presurgical expectations and post-operative realities vary from patient to patient. Patients have a strong desire to return to the way their daily lives were prior to being functionally limited by knee pain. They have very high expectations that their knee pain will be relieved as well as ADL function fully restored. Patients tend to have unrealistic expectations of surgical outcomes that they may have difficulty achieving.

The concept of patient satisfaction is a balance between expectations and perceptions. Patients develop satisfaction beliefs during the time that they have decided
to move forward with surgery. Satisfaction may be directly related to pain relief, increased function and mobility in the knee, or better self-reported mental health reflecting general happiness. There is growing literature stating psychological factors (e.g., catastrophizing, pain related fear of movement and depression) have significant value in prediction of post-TKA pain severity and physical function (Edwards, Haythornthwaite, Smith, Klick, & Katz, 2009; Forsythe, Dunbar, Hennigar, Sullivan, & Gross, 2008; Riddle, Wade, Jiranek, & Kong, 2010; Sullivan et al., 2011).

Statement of the Problem

Arthritis severely affects overall health and health related quality of life. Patients choose to resolve life altering knee pain by seeking surgical intervention of TKA. Patients that choose to have TKA may have improved functional outcomes if they are better prepared for the complexities of TKA recovery. It has been suggested that instruction from health care professionals may play a significant role in the development of patients’ outcome expectancies (Sullivan et al., 2011). Educational material regarding TKA may be obtained from a variety of sources such as the Internet, healthcare agencies, or other media sources. Educational interventions (e.g., educational joint replacement class, videos, and educational literature) need to be implemented prior to TKA for improved functional outcomes.

Purpose of the Study

The purpose of this study was to identify if patients’ perceptions of their functional abilities prior to TKA were similar to their actual post-operative functional abilities at 4 to 6 weeks post-TKA if they attended an educational joint replacement class prior to surgery.
Research Question

The following research question was proposed: Do patients’ perceptions of their functional abilities change 4 to 6 weeks post-TKA after attending an educational joint replacement class prior to surgery? This research question was addressed with the proposed study. The independent variable was the educational joint replacement class. Patient perceptions were the dependent variable as they are highly individualized.

Hypothesis

Patients’ perceptions will change regarding their post-operative expectations related to functional abilities 4 to 6 weeks post-TKA after attending an educational joint replacement class.

Theoretical/Conceptual Framework

Dorothea Orem’s Self-Care Deficit Nursing Theory addresses the patient’s self-care as “the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being” (Orem, 2001, p. 43). Orem states that people develop methods to overcome limitations at specific times to meet their needs. There are phases of actions that patients must go through that include their present state of affairs (knee pain and dysfunction) and their desirable future state of affairs (post-TKA and freedom from pain and increased mobility). In this situation of action, uncontrollable factors give rise to conditions of action. Controllable factors give rise to nursing being able to give means to effect change from the present state of affairs to the desirable future state of affairs (Orem, 2001). This aligns well with patients that have chronic knee pain related to arthritis that require TKA. This population typically has decreased function
with activities of daily living (ADL’s) that affect their lives. They want to get better, have decreased pain and increased independence with ADL’s.

Definition of Terms

The operational terms and definitions for this study were:

- **Total Knee Arthroplasty (TKA)** is a unilateral total knee replacement.

- **Functional Abilities** are components of physical health and mental health. Physical health is defined as a combination of physical functioning (e.g., climbing stairs, bathing, kneeling and bending of the knee), role-physical (accomplishing less than desired or limitations in regular daily activities), bodily pain (how much pain interferes with normal activities), and general health (how the patient rates his/her general health) (Ware, Kosinski, & Keller, 1996). Mental health is defined as a combination of vitality (to what extent a person feels energized), social functioning (how much physical or emotional problems cause difficulty with normal social activity), role-emotional (how much work or regular activities are able to be performed and how accurately), and mental health (how the patient is feeling, e.g., anxious, nervous, depressed, happy) (Ware et al., 1996).

- **Physical health** is the degree of limitation that symptoms imposed on the patient’s activities of daily living (e.g., difficulty with ambulation, stair climbing, standing, rising from chair).

- **Mental health** is general mental health perceptions (e.g., depressed, anxious, happy), vitality, and social functioning (e.g., ability to socially do what a person wants to do with friends and family).
• **Activities of Daily Living (ADL)** refers to a person being able to tend to their self-care needs of daily life. This included basic ADL’s such as bathing/showering, dressing, functional mobility (being able to move from one place to another while performing activities), and sexual activity. Also included were instrumental ADL’s such as housework, shopping activity, and the care of others and pets.

• **Educational joint replacement class** is the class offered to prospective patients for total knee or hip replacement surgery. The class was offered by both Gwinnett Medical Center-Lawrenceville and Gwinnett Medical Center-Duluth, which included information on TKA operative procedure (normal anatomy versus TKA anatomy), complication prevention, surgical process, pain management, infection prevention, and the rehabilitation process.

**Assumptions and Limitations**

**Assumptions.** The convenience sample for this study included patients who had elected to have TKA and voluntarily completed an educational joint replacement class. The curriculum of the educational joint replacement class was the same at Gwinnett Medical Center-Lawrenceville and Gwinnett Medical Center-Duluth. There were different instructors with different teaching styles. Participants who had attended the educational joint replacement class learned from the class. Participants who attended the educational joint replacement class are no different from TKA patients who had not attended a joint replacement class. Persons who had not attended the educational joint replacement class were not included in the research study.
Limitations. A limitation of this study was based on the researcher’s inability to directly assess the physical and mental abilities of the participants who completed the questionnaires. The joint replacement class was also designed for patients that were having total knee or total hip arthroplasty. The educational joint replacement class was taught on two different campuses within the same hospital system.
CHAPTER 2: REVIEW OF THE LITERATURE

The following literature review discusses topics relating to patient perceptions regarding expected outcomes and functional abilities after TKA. This literature review focuses on patient expectations and outcome beliefs after TKA, patient satisfaction beliefs, and education impact on patient perceptions.

Patient expectations and outcome beliefs

Patient expectations as well as their perceptions are their reality. Patients that have chronic knee pain, alterations in mobility, and modified lifestyles due to arthritic conditions have developed very strong expectations of what life will be like after TKA. Marcinkowski, Wong, and Dignam (2005) performed a grounded theory study with nine participants describing the experience of adults with arthritis who had TKA. The goal of their study was to explore the process of TKA from the patient’s perspective. Data from 17 were collected via unstructured verbal interviews that were recorded and transcribed verbatim. The researchers identified the perceptions of the patients as “enduring” their daily lives, “thinking twice” regarding the patients’ adaptation and problem solving, and “keeping faith” with trust and a positive outlook while progressing through the surgical process and continuing through rehabilitation after TKA. Patients wanted to return to a pain free life without disability and the only way of achieving this was to anticipate the future and how their mobility would be improved.

Muniesa et al. (2010) concluded from their research that patient expectations of improvement before TKA are high. They performed a cross-sectional study of patients
waiting for TKA surgery. The assessment instruments used included the Knee Society Score (KSS), Verbal Pain Scale (VPS), Charleston Comorbidity Index (CCI), Geriatric Depression Scale (GDS), Short Form-36 (SF-36), and the Spanish version of the Short Portable Mental Status Questionnaire (SPMSQ). Important patient expectations included improvement in pain, basic functional activities (such as walking and stair climbing), and general well-being (Muniesa et al.).

Razmjou et al. (2009) conducted a study of patients \( N = 208 \) to determine relationships between patient expectations for improvement after TKA and preoperative characteristics. Razmjou et al. (2009) utilized SF-36 Health Survey, the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC), and an Expectation Questionnaire to determine patient expectations. They ascertained that physical and mental health were linked to patient expectations of improved abilities with ADL’s, and that patients have high expectations for recovery. Razmjou et al. (2009) stated that healthcare staff working with patients undergoing TKA needed to consider the individual characteristics of patients who have elevated expectations of recovery so that more effective and achievable patient education can be developed.

Nilsdotter et al. (2009) studied patients \( N = 102 \) over five years who underwent TKA at Lund University Hospital, Sweden. The assessment instruments used were Knee Injury and Osteoarthritis Outcome Score (KOOS) and SF-36. KOOS is an extension of the WOMAC but was designed for use with younger and/or physically active patients with knee injury or osteoarthritis. The patients expected higher ADL function (96%) than recreational function (72%). Pain perception was also met with high expectation as 98% expected significantly less pain post TKA. Patients were generally satisfied with the TKA
procedure but the high expectations of pain relief and ADL function were not completely fulfilled. Nilsdotter et al. suggested that healthcare workers need to instruct patients pre-operatively so that more realistic expectations may result following TKA.

In summary, patient expectations related to post-operative outcomes have generally been higher than actual TKA post-operative outcomes. Patients have high expectations to achieve decreased pain, improved mobility and ease with personal ADL’s. Achieving these desired outcomes can be challenging. Comprehensive joint replacement education instruction prior to surgery may produce more realistic goals and more effective outcomes for patients.

**Patient satisfaction beliefs**

Patient satisfaction is a multidimensional descriptor that varies from patient to patient depending on their expectations. Generally, satisfaction is largely determined by whether expectations were met or not. Perceived expectations can vary among patients based on their decision to have TKA. Decreased pain, increased functional abilities, and improved quality of life are compelling reasons for TKA. A technically successful TKA may not indicate that the patient has achieved satisfaction if pain is not decreased or relieved, experiences less-than-expected function in the affected knee, and/or improvements in quality of life.

Becker, Doring, Denecke, and Brosz (2011) identified that “patient satisfaction is the most important outcome measurement” (p. 1433) for patients who have experienced TKA. They performed a prospective study of consecutive patients ($N = 102$) with osteoarthritis of the knee scheduled for TKA. Their aim was to explore the relationship between patient expectation, fulfillment of their expectations, and clinical outcomes after
TKA. Instruments used were WOMAC, SF-36, and the KSS, which is a common scoring system assessing the patient’s evaluation of knee joint pain, range of motion and stability, as well as ability to ambulate and climb stairs after TKA. The researchers discovered that satisfaction is multifactorial. Satisfaction cannot be based solely on objective parameters of knee function after TKA, but must include a combination of the patient’s mental and physical wellbeing (Becker, Doring, Denecke, & Brosz).

Mohamed et al. (2002) evaluated the relationship between patient expectations of TKA and patient satisfaction and quality of life after surgery. In a two year study, participants (N = 192) completed questionnaires, the SF-36 and WOMAC, which evaluated functional ability and mental health. The investigators discovered that “patients had high expectations for outcomes with over 75% expecting to be pain free and 40% to be unlimited in their mobility” (p. 1276). Individuals with higher education levels and lower comorbidities tended to expect better outcomes and also attained better outcomes. Preoperative functional health status and patient expectations were determined to be the most important predictors of outcomes. Mohamed et al. concluded that health care providers need to provide clarity of expectations of the potential benefits of TKA to avoid inappropriate expectations that may lead to less than optimal outcomes.

Vissers et al. (2010) studied arthritic knee patients (N = 44) pre-operatively and six months post-surgery. The researchers measured functional capacity of daily activity using the Six-Minutes Walk Test (6MWT) to quantify walking ability as well as stair climbing and chair rising capacity. Expectations, fulfilled expectations, and joint function were measured at six weeks and six months post-operatively using WOMAC, SF-36 and the Hospital Anxiety and Depression Scale (HADS). Vissers et al. discovered that “in this
The patient group 50% was very satisfied, 22.7% moderately satisfied, 11.4% neutral, 9.1% moderately dissatisfied, and 6.8% very dissatisfied” (p. 4). The researchers discovered that “patients with a better self-reported mental functioning before surgery were more often satisfied post-surgery” (p. 4).

Satisfaction was the focus of the patient’s perceived expectations. Patient satisfaction was dependent upon many factors such as knee mobility and pain, alterations in ADL’s and lifestyle, as well as mental and physical wellbeing. Patient expectations needed to be clear prior to TKA surgery. There are two questions that need to be addressed regarding patient expectations. What exactly are patients expecting will occur after TKA? Are they expecting complete pain relief, increased ease of mobility with the affected knee, or the ability to return to prior levels of functioning? Perhaps if patients receive better instruction prior to surgery their expectations will be more realistic and their physical function more readily attained.

**Education impact on patient perceptions**

Education prior to surgery may affect patients’ perceived expectations which may have a direct relation to patient outcomes. Surgery may be successfully performed yet the patient may still be unsatisfied. Perception is a key component to overall patient satisfaction. Pre-operative education is vital to patient satisfaction. Expectations can be better managed if patients are given thorough instruction prior to surgery on the mental and physical demands of recovery post TKA. Patients will have more realistic expectations if they are better prepared for surgery.

Hepinstall et al. (2011) explored the effects of patient factors on expectations before TKA (N=1943). Measurement tools used were SF-36, KOOS, and the Lower
Extremity Activity Scale. The investigators desired “to measure the influence of demographics, general health status, and disease severity on those expectations” (p. 873). High expectations were observed in over 30% of the patients who completed the surveys. Of the patients surveyed, younger patients, male patients, and white patients all had higher expectations of TKA. Although differences in race “did not reach statistical significance on binary comparison ($P = 0.12$ for White vs. Black comparison, $P = 0.93$ for White vs. Asian comparison, $P = 0.35$ for Black vs. Asian comparison)” (p. 873), neither did they find a significant relationship between ethnicity or level of education (Hepinstall et al., 2011). Using univariate analysis, Hepinstall et al. also discovered that patients with a prior history of TKA had more accurate expectations for subsequent TKA surgery since they had previous experience with the procedure and recovery. This led Hepinstall et al. to conclude that “identifying and addressing unrealistic expectations could improve both surgical indications and patient satisfaction” (p. 875). The identification and addressing of unrealistic surgical expectations could be managed with a presurgical educational joint replacement class.

Lucas, Cox, Perry, and Bridges (2012) developed an information booklet for TKA patients, *Action Cycle*. The booklet explained the patient pathway from the surgical appointment of the TKA surgery through long term follow-up. The booklet incorporated many details including self-management of pain and principles of self-efficacy that were beneficial for the patient’s knowledge. Patients received education during every interaction with the “Knee Clinic”. A mixed methods design was utilized that included data from two evaluation surveys as well as data collected from semi-structured interviews with patients preparing for TKA. Data indicated patients felt that they had
more knowledge about TKA pre-operatively and post-operatively because of direct patient education via the information booklet and interactions with physical and occupational therapists by individual consultation while at the Knee Clinic (Lucas, Cox, Perry, & Bridges).

Sullivan et al. (2011) researched individuals scheduled for TKA from three hospitals in eastern Canada, $N = 120$. Assessment tools included the WOMAC to assess pain and function, the Pain Catastrophizing Scale (PCS) measuring catastrophic thinking related to pain, the Tampa Scale for Kinesiophobia (TSK) assessing pain related fear of movement, Patient Health Questionnaire (PHQ-9) measuring depressive symptom severity, and questions concerning expectancies for recovery following TKA. “Analysis revealed that behavioral outcome expectancies were more strongly correlated with follow-up pain severity and functional limitations than response expectancies” (p. 2289). These researchers also suggest that joint replacement education from health care professionals to prospective TKA patients may play a role in development of behavioral outcome expectancies (e.g., return to function).

Jones et al. (2012) determined that the incorporation of routine patient education may be the best method of ensuring that patient expectations regarding their future outcome are appropriate at the onset of the journey towards TKA. Patients enrolled in their study ($N = 90$) were scheduled for TKA and assessed for expectations after surgery focusing on pain relief, functional limitations, likelihood of success or complications, and return to leisure activities. Many other researchers have focused on the same patient expectations, but Jones et al. were unique in their investigation of patient expectations which included patient’s return to leisure activities and not concentrate only on pain relief.
and improvement in functional ability. Leisure activities included golfing, tennis, swimming, and basketball, ranging from low intensity to high intensity activities. Jones et al. stated that patients undergoing TKA expected to significantly increase their leisure activity 12 months post-surgery. Patients did increase their levels of leisure activity, there was a statistically significant difference, $p = .001$ between actual and expected leisure activity. At baseline (before TKA) patients were able to perform approximately 2.5 hours per week of leisure activity. Patients expected to increase their leisure activity to approximately 25 hours per week 12 months post TKA. The actual number of hours achieved 12 months post TKA was approximately 10 hours of leisure activity, $23.3 \pm 41.1$ vs. $10.8 \pm 2.8$ median metabolic equivalent hours, $p = .001$, significantly less than was expected. Jones et al. concluded that patients may benefit from pre-operative education on expectations that are realistic.

Therefore, the need for patient education is significant. There are powerful indicators that patient expectations may be better managed through instruction prior to surgery. Management of patient expectations prior to surgery is integral to improved patient perceptions of outcomes. Patients create high expectations for recovery that are often not met. Healthcare professionals can alleviate the frustration that patients are apt to experience through educational joint replacement education prior to surgery.

Summary of Review of the Literature

A combination of patient expectations, satisfaction beliefs (whether their expectations are met or not), and education received prior to TKA affect patients’ perceptions and functional abilities after TKA. Arthritis is an incapacitating disease, especially of the knee, that is readily improved by TKA surgery. Patients that seek this
surgery have strong desires to decrease pain, increase physical function and regain a sense of normalcy. Patients tend to have unrealistic expectations of the surgical process and outcome expectancies. There is a compelling link between presurgical expectancies and satisfaction with TKA outcomes.

Satisfaction is multidimensional, highly personal, and can only be defined by the patient. It is the patient’s definition of satisfaction that determines the success of the surgery. Satisfaction includes a combination of knee function and factors related to the patient’s personal sense of psychological and physical well-being. Appropriate surgical expectations ultimately leading to patient satisfaction can be achieved with presurgical joint education.

Dorothea Orem’s Self-Care Deficit nursing theory encourages patients to develop methods to overcome limitations to meet their personal needs. Patients make deliberate decisions regarding when to have surgery and they develop many preconceptions as to how the surgical process and recovery will personally affect their lives. Orem (2001) addresses phases of action in self-care. According to Orem, phase one is an investigative phase ending with judgments about situations that are subject to changes. Phase two discusses decisions and actions required to achieve an end to the situational problem. The patient knowing and deciding to have TKA are the first and second phases of action in the process to overcome limitations caused by knee dysfunction. The task of overcoming limitations may be more successful if expectations and perceptions are appropriate. Once appropriate realistic expectations are developed, patients are more prepared for TKA and should have more accurate perceived outcomes.
Presurgical joint education prior to TKA may hold the key to patient satisfaction if the patient’s perceived expectations are met. Patients will be better prepared if expectations are managed. Management of expectations can be achieved through presurgical comprehensive joint education. Patients’ fear of the unknown regarding TKA can be addressed in a nonthreatening environment. By instituting joint education prior to surgery many concerns of patients are addressed. Consistency in all educational material (e.g. literature, discussions, classes) is needed. Education material that is consistently utilized keeps the patient current on educational material and on target with appropriate expectations post-TKA.
CHAPTER 3: METHODS

The purpose of this study was to identify if patients’ perceptions of their functional abilities prior to Total Knee Arthroplasty (TKA) were similar to their actual post-operative functional abilities at 4 to 6 weeks post-TKA if they attended an educational joint replacement class prior to surgery.

Research Design

The design of this study was a one group pre-test, post-test. Data were collected prior to the educational joint replacement class and 4 to 6 weeks after TKA.

Setting

The research took place at both Gwinnett Medical Center-Lawrenceville and Gwinnett Medical Center-Duluth. The research focused on participants of the educational joint replacement class that is offered to prospective patients intending to have TKA or total hip replacement. The educational joint replacement class is offered multiple times per month on both campuses. The education joint replacement class is a comprehensive 2-hour program. During the class patients viewed an educational PowerPoint regarding typical expectations of total joint replacement. Content covered included anatomy of the joint, preparing for surgery, and descriptions of the normal hospital processes of preparing for surgery (preadmission testing, the preoperative area, operating room, recovery room, and transition to a room after surgery). Other topics covered were prevention of pneumonia, exercises, and the rehabilitation process. During the class, patients were encouraged to start planning ahead to make changes within their home
before surgery, as well as pain control after surgery, signs and symptoms of infection, and when to call the surgeon. The patients were introduced to the physical therapists and case managers during class time. At the conclusion of class, patients were given a walking tour of the facility.

**Sample and Participant Selection**

A convenience sample of 17 participants were recruited from among 27 prospective patients who had elected to have TKA and attended an educational joint replacement class offered by Gwinnett Medical Center-Lawrenceville or Gwinnett Medical Center-Duluth. Participants in the study were 40 years of age or older and English speaking. Only patients who elected to have a unilateral total knee arthroplasty were enrolled. Informed consent (Appendix A) was obtained prior to data collection.

**Instruments**

The instruments for this study included a demographic questionnaire (Appendix B), the Knee Outcome Survey Activities of Daily Living Scale (KOS-ADLS) (Appendix C), and the Short Form 12 version 2 (SF-12 v2) (Appendix D). The demographic questionnaire developed by the researcher consisted of nine elements: gender, age, anticipated date of surgery, language spoken, race, marital status, highest level of education completed, current work situation, and estimated household income. The KOS-ADLS and the SF-12 v2 utilized a Likert scale to evaluate physical and mental components of patient health perceptions.

**Knee Outcome Survey, Activities of Daily Living Scale.** The Knee Outcome Survey (KOS) consisted of two independent scales, the Activities of Daily Living Scale (ADLS) and the Sports Activity Scale (SAS). The ADLS scale only includes items
related to functional limitations and symptoms that occur during activities of daily living. The SAS only consists of symptoms and functional limitations that occur during sports activities. This study only utilized the KOS-ADLS as this scale can be used independently of the SAS since it assesses two different aspects of symptoms and functional limitation. The KOS-ADLS is a 14-item scale that inquired about a patient’s knee symptoms and its effect on functional limitations during activities of daily living. (Irrgang, Snyder-Mackler, Wainner, Fu, & Harner, 1998). The KOS was developed at the University of Pittsburgh for specific knee conditions, such as osteoarthritis and ligamentous injuries. The internal consistency of the KOS-ADLS showed coefficient alphas ranging from 0.92 to 0.93 during instrument validation indicating acceptable reliability (Irrgang et al., 1998). The KOS-ADLS was compared with the Lysholm Knee Scale as well as the Global Assessment of Function which are both concurrent measures of knee function. Validity demonstrated moderately strong correlations with similar measures of function: Lysholm Knee Scale ($r = 0.78$ to $0.86$) and global assessment of function ($r = 0.66$ to $0.75$) (Irrgang et al., 1998). The analysis of variance was also assessed at 4 weeks ($F = 33.50; p < 0.001$) and at 8 weeks ($F = 22.48; p < 0.001$) indicating “that patients who said that the knee was somewhat improved had a significantly smaller change in the score compared with those who said that it was greatly improved” (p. 1140). The test-retest reliability correlation coefficient was 0.97.

The response format of the survey questionnaire is in two parts: symptoms category and functional limitations with activities of daily living category. The symptoms category consists of a 6-point Likert scale ranging from “I do not have the symptom (score 5)”, indicating absence of symptoms to “The symptom prevents me from all daily
activities (score 0)” indicating severe symptoms that prevent the patient from performing all activities. In the functional limitations with activities of daily living category the 6-point Likert scale ranges from “Activity is not difficult for me (score 5)”, indicating no limitations, to “I am unable to do the activity (score 0)”, indicating inability to perform the activity. Participants were asked to check the statements that best described how they felt over the last 1 to 2 days. The maximum raw score possible is 70. The KOS-ADLS score was calculated by summing the individual responses dividing by 70 then multiply by 100. Permission was obtained from the developer of the scale to use the KOS-ADLS in this study (Appendix E).

**Short Form 12 version 2.** The SF-12 v2 is a 12-item scale developed from a proven health survey, the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36). The SF-12 v2 assessed four components each in mental and physical health. Mental health assessed a combination of vitality (to what extent a patient felt energized), social functioning (how much physical or emotional problems caused difficulty with normal social activity), role-emotional (how much work or regular activities were able to be performed and how accurately), and mental health (how the patient was feeling, e.g., anxious, nervous, depressed, happy) (Ware, Kosinski, & Keller, 1996). Physical health measured a combination of physical functioning (e.g., climbing stairs, bathing, kneeling and bending of the knee), role-physical (accomplishing less than desired or limitations in regular daily activities), bodily pain (how much pain interfered with normal activities), and general health (how the patient rated their general health) (Ware et al.). In the creation of the SF-12 v2, Ware et al. used regression to select the 12 items from the SF-36 ($R$ squares 0.911 and 0.918) for predictions of physical and mental components, as
well as test-retest correlations of 0.89 and 0.76 were observed indicating proven reliability. Validity criteria for physical components ranged from 0.43 to 0.93 with median = 0.67 and mental components ranged from 0.60 to 1.07 with median = 0.97 in relation to the SF-36 (Ware et al.).

The response format of the SF-12 v2 questionnaire is a Likert scale with responses ranging from excellent (score 1) to poor (score 5) for the first question inquiring about general health. The second question inquired about how your health limits you now with responses ranging from limited a lot (score 1) to not limited at all (score 3). The next four questions assessed physical and emotional health over the past four weeks and had responses ranging from all of the time (score 1) to none of the time (score 5).

The SF-12 v2 also had a follow up telephone questionnaire (Appendix F) used for subsequent telephone calls to participants. The questionnaire asked the same questions that the participant self-completed, but was written in a scripting format that allowed the researcher to verbally complete the form with the participant.

License agreement (Appendix G) as well as scoring software had been obtained by the researcher to use the SF-12 v2 from Quality Metric, an OptumInsight company.

**Data Collection and Procedures**

Prior to beginning the research, approval to conduct the study was obtained from the Office of Research at Gwinnett Medical Center (Appendix H). Additionally, Institutional Review Board approval (Appendix I) was obtained from Kennesaw State University.
Participants were invited to participate in the study by the researcher calling all of the TKA patients enrolled in the educational joint replacement class prior to the scheduled class time. Participants who decided to participate in the study were asked to arrive 30 minutes prior to the start of class to complete consents, the demographics form, and questionnaires. Once participants arrived 30 minutes prior to the start of the educational joint replacement class they were consented and enrolled in the research study. Participants were then asked to independently complete the demographic questionnaire, KOS-ADLS, and the SF-12 v2. It took approximately 10-15 minutes for participants to complete all of the instruments prior to the start of the educational joint replacement class. A reminder post card was mailed to the address that participants provided, notifying them that the researcher would contact them by telephone 4 to 6 weeks post TKA. During the follow up telephone call the researcher verbally re-administered the KOS-ADLS and SF-12 v2.

Several threats to validity existed. A participant’s personal history could be confounded by previous attendance at an educational joint replacement class, prior total joint replacement of any type, or having a family member or close friend that may have previously attended a class who shared their experience. A test, re-test threat could occur because the same measurement tools were used at the joint replacement class as well as for the follow up telephone call, as some participants may have remembered how they responded to the questions. A regression threat could have occurred if patients modified their behavior due to the instruction received in the joint replacement class. There was also the threat of experimental mortality if patients withdraw from the study prior to
follow up. Threats to validity were managed via intention-to-treat analysis which analyzed outcomes for all participants, even if they participated only at enrollment.

Protection of human rights was implemented throughout the research process. All data was collected anonymously. Each participant was assigned a study number and personal contact information was kept separate from the assessment data. Following enrollment all data were managed by the participant’s study number. All results of the research were reported in aggregate form without any identifying information. The information provided was only shared with individuals directly involved in the research study. All paper data (assessment forms) containing participants’ responses were entered into a computer program for analysis, password protected. During the study all paper data were secured in a locked file cabinet in the researcher’s office at Gwinnett Medical Center-Duluth when not being used. At the end of the study, all paper data were destroyed using the official document destruction system of Gwinnett Medical Center-Duluth. Also, computer data were transferred to a password protected flash drive that was secured in a locked file cabinet in the researcher’s office at Gwinnett Medical Center-Duluth when not being used. All information was deleted from the computer after transfer to the flash drive at the end of the study. Electronic data were archived in a locked/secured file cabinet for three years following the close of the study and then destroyed by the hospital approved document destruction system at Gwinnett Medical Center-Duluth. At no time was any personal data shared with anyone who was not directly involved in this research study.
**Data Analysis**

Data analysis consisted of descriptive statistics and inferential statistics-paired t-test. Descriptive statistics were used to describe the demographics of the participant population. Paired t-test had been utilized to compare the means between the results of the KOS-ADLS pre-test and post-test. Data for the KOS-ADLS was also validated with the Wilcoxon signed-rank test, the nonparametric version of the two sample t-test. Paired t-test was also utilized to compare the means between patient perceptions of physical health and mental health of the SF-12 v2.
CHAPTER 4: RESULTS

The purpose of this study was to identify if patients’ perceptions of their functional abilities prior to Total Knee Arthroplasty (TKA) were similar to their actual post-operative functional abilities at 4 to 6 weeks post-TKA if they attended an educational joint replacement class prior to surgery. The following results assisted in answering the research question: Do patients’ perceptions of their functional abilities change 4 to 6 weeks post-TKA after attending an educational joint replacement class prior to surgery?

Descriptive Findings

A total of 38 persons enrolled in the joint replacement class at Gwinnett Medical Center-Lawrenceville and Gwinnett Medical Center-Duluth. Of these individuals, 27 were anticipating a unilateral TKA, 2 were planning to undergo a bilateral TKA, and 9 were schedule for a total hip arthroplasty. Seventeen of the class participants were enrolled in the study and completed the pre-test assessment over a 30-day time period. However, only 8 were available to complete the post-test assessments. Demographic analysis was completed using IBM SPSS 20 software. The distribution of participants in the educational joint replacement class between both Gwinnett Medical Center-Lawrenceville and Gwinnett Medical Center-Duluth was not even. Of the participants, 76% ($n = 13$) were from Gwinnett Medical Center-Lawrenceville, and 24% ($n = 4$) were from Gwinnett Medical Center-Duluth.
Pre-test

The ages of participants ranged from 50 to 79 years with a mean age 67. The sample consisted of 65% \((n = 11)\) female and 35% \((n = 6)\) male. The majority, 88% \((n = 15)\), self-identified as European American. Regarding marital status, 76% \((n = 13)\) were married, 12% \((n = 2)\) single, 6% \((n = 1)\) divorced and 6% \((n = 1)\) widowed. The education status of participants included 35% \((n = 6)\) who completed some high school or graduated high school. The same number, 35% \((n = 6)\) also completed four years of college or attended college. Of the remaining participants, 30% \((n = 5)\) had completed a master’s degree or higher level of education. Forty-one percent \((n = 7)\) worked full-time or part-time and 47% \((n = 8)\) were retired, with the remaining 12% \((n = 2)\) not working. The median household income ranged between $30,000-50,000 per year. Thirty percent \((n = 5)\) had incomes less than $30,000 and 30% \((n = 5)\) had incomes greater than $70,000.

Post-test

Eight participants completed the post-test assessment. Their ages ranged from 50 to 75 years with a mean age of 62. The sample was 63% \((n = 5)\) female and 37% \((n = 3)\) male. The majority 75% \((n = 6)\) self-identified as European American. Thirty-eight percent \((n = 3)\) completed some high school or graduated high school. The same percentage completed four years of college or attended college. Of the remaining participants, 24% \((n = 2)\) had completed a master’s degree or higher level of education. Sixty-two percent \((n = 5)\) worked full-time or part-time and 38% \((n = 3)\) were retired. Seventy-one percent \((n = 5)\) had incomes less than $70,000 per year and 29% \((n = 2)\) had incomes greater than $70,000.
Participants Who Did Not Complete Post-test

Nine of the 17 participants did not complete the post-test assessment. Their ages ranged from 58 to 79 years with a mean age of 71. This sample was 67% \((n = 6)\) female and 33% \((n = 3)\) male. All self-identified as European American. Seven participants \((78\%)\) indicated being married, while the remaining 22% \((n = 2)\) were divorced or widowed. Regarding education, 33% \((n = 3)\) completed some high school or graduated high school. Thirty-three percent \((n = 3)\) completed four years of college or attended college. The remaining participants 33% \((n = 3)\) had completed a master’s degree or higher level of education. None of the participants worked full-time, 22% \((n = 2)\) worked part-time, 56% \((n = 5)\) were retired, and the remaining 11% \((n = 2)\) were not working. More than half 56% \((n = 5)\) had incomes of $50,000 per year or less and 44% \((n = 4)\) had incomes of $51,000 or greater. Table 1 displays the demographic characteristics of the TKA class participants.

A post-hoc power analysis was conducted as the sample size was small. A sample size of 50 to 100 participants would have been sufficient to detect any of the more reasonable sized effects as measured by Cohen’s \(d\) at a power of 0.8 with an alpha level of 0.05. Cohen’s \(d\) is used to measure the effect size in a two-group design where mean differences are being assessed (Polit & Beck, 2012).
Table 1

Demographic Characteristics of Total Knee Arthroplasty Class participants (N = 17)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>35.3</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>64.7</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American/Black</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>European American/White</td>
<td>15</td>
<td>88.2</td>
</tr>
<tr>
<td>Native American/American Indian/Alaskan Native</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td>Married</td>
<td>13</td>
<td>76.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td>Graduated high school/GED</td>
<td>4</td>
<td>23.5</td>
</tr>
<tr>
<td>Some college</td>
<td>4</td>
<td>23.5</td>
</tr>
<tr>
<td>Completed four years of college</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>college (degree received)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s degree</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td>Doctorate degree</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Current work situation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed full-time</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>4</td>
<td>23.5</td>
</tr>
<tr>
<td>Not working/disability</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Homemaker/caregiver</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Retired</td>
<td>8</td>
<td>47.1</td>
</tr>
<tr>
<td>Income per year before taxes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$30,000</td>
<td>5</td>
<td>29.4</td>
</tr>
<tr>
<td>$30,000-$50,000</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td>$51,000-$70,000</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td>&gt;$70,000</td>
<td>5</td>
<td>29.4</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>5.9</td>
</tr>
</tbody>
</table>
**Hypothesis**

The hypothesis: Patients’ perceptions will change regarding their post-operative expectations related to functional abilities 4 to 6 weeks post-TKA after attending an educational joint replacement class.

The paired t-test was used to analyze the results of the Knee Outcome Survey, Activities of Daily Living Scale (KOS-ADLS) using Minitab 16. The paired t-test is a parametric test used for testing differences between group means (Polit & Beck, 2012). The t-test results were: pre-test ($M = 38.00$, $SD = 17.87$), post-test ($M = 55.38$, $SD = 10.16$). There was a mean gain of 17.38 ($SD = 21.20$) from pre-test to post-test. The test statistic was statistically significant $2.32 (7)$, $p = 0.027$. Results indicated improvement in knee symptoms reduction and functional limitation with activities of daily living. The Wilcoxon signed-rank test was used to verify the paired t-test results due to the small sample size. The Wilcoxon signed-rank test is a non-parametric test for comparing two paired groups (2012). The paired t-test and Wilcoxon signed-rank test both compare the two scores and had similar results. The Wilcoxon signed-rank test results ($t = 32$, $p = 0.029$) also reached statistical significance.

There were two outlier scores, from one male participant, in the sample population and results were reanalyzed excluding this participant. When this participant’s scores were omitted, the results of the KOS-ADLS were as follows: pre-test ($M = 34.29$, $SD = 15.62$), post-test ($M = 57.00$, $SD = 9.78$). There was a mean gain of 22.71 ($SD = 16.07$) from pre-test to post-test. The test statistic value was 3.74 (6), $p = 0.005$, indicating significance between pre and post-test scores. Table 2 displays the results of the KOS-ADLS paired t-test.
The paired t-test was also used to see if gender was a predictor of the difference in scores. The results were as follows: female \((n = 5, M = 29.0, SD = 14.6)\), and male \((n = 3, M = -2.0, SD = 15.7)\). The paired t-test examined the difference between female and male results, using gender as the independent variable, found that the mean difference scores between pre and post was greater for women than for men. The test statistic value was 2.77(4), \(p = 0.025\). The Wilcoxon signed-rank test results indicated similar results \((t = 30, p = 0.0369)\). The results indicated that female mean score differences were greater than males.

Omitting the outlier data, to verify the results indicated the following: female \((n = 5, M = 29.0, SD = 14.6)\), and male \((n = 2, M = 7.00, SD = 2.83)\). The test statistic value was 3.23 (4), \(p = 0.016\) signifying female score differences were greater than males even without the outlier data. Table 3 displays the results of the KOS-ADLS paired t-test, outlier removed.

---

Table 2

*Knee Outcome Survey, Activities of Daily Living Scale Scores\(( n = 8)\)*

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Post-test</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(M = 38.0)</td>
<td>(M = 55.38)</td>
<td>(M = 17.38)</td>
</tr>
<tr>
<td>(SD = 17.87)</td>
<td>(SD = 10.16)</td>
<td>(SD = 21.20)</td>
</tr>
</tbody>
</table>

Note. \(M = \text{Mean}; SD = \text{Standard Deviation}\)
The outcome scores for each participant from the Short Form 12, version 2 (SF-12 v2) were analyzed using QualityMetric Health Outcomes™ Scoring Software 4.5.1. The outcome scores generated assessed components of physical health (Table 4) and mental health (Table 5). Analysis using paired t-tests for patient perceptions was performed. The two components of the SF-12 v2 questionnaire assessed the effects of physical health (the degree of limitation that symptoms imposed on the patient’s activities of daily living) and mental health (general mental health perceptions, vitality, and social functioning) before TKA and four weeks post-TKA. Physical health effects were as follows: physical function ($n = 8, M = -3.1, SD = 36.4, t = -0.24, p = 0.815$), role physical ($n = 8, M = 6.25, SD = 22.16, t = 0.80, p = 0.451$), bodily pain ($n = 8, M = 15.6, SD = 29.7, t = 1.49, p = 0.180$), general health ($n = 8, M = -6.25, SD = 18.47, t = -0.96, p = 0.370$), and physical component summary ($n = 8, M = 0.38, SD = 6.05, t = 0.18, p = 0.865$). There was no significant difference in the mean scores. Three of the five physical health components, role physical, bodily pain, and physical component summary had positive, though not significant, changes. These were changes in the direction of worse health as the post mean scores were larger than the pre mean scores. Worse health is defined as a decline in

Table 3

*Knee Outcome Survey, Activities of Daily Living Scale Scores (n = 7) Outlier Removed*

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M = 34.29$</td>
<td>$M = 57.00$</td>
<td>$M = 22.71$</td>
<td></td>
</tr>
<tr>
<td>$SD = 15.62$</td>
<td>$SD = 9.78$</td>
<td>$SD = 16.07$</td>
<td></td>
</tr>
</tbody>
</table>

Note. $M = \text{Mean}; SD = \text{Standard Deviation}$
physical functioning or mobility of the knee, accomplishing less than desired or limitations in regular daily activities, increases in bodily pain, and how the participant rated their general health.

The mental health effects were: vitality \((n = 7, M = 7.1, SD = 27.8, t = 0.68, p = 0.522)\), social functioning \((n = 8, M = 12.5, SD = 29.9, t = 1.18, p = 0.275)\), role emotional \((n = 8, M = 20.3, SD = 36.6, t = 1.57, p = 0.160)\), mental health \((n = 8, M = 11.02, SD = 24.65, t = 1.26, p = 0.246)\), and mental component summary \((n = 8, M = 6.71, SD = 11.98, t = 1.59, p = 0.157)\). There was not a significant change in any of the mean scores. All of the mental health components had positive, though not statistically significant changes. These changes were in the direction of worse health as the post mean scores were larger than the pre mean scores. Worse health is described as a decrease in energy levels, how much physical or emotional problems interfered with normal social activity, how much work or regular activities could be performed, and how the participant was feeling.
Table 4

*Short Form 12 version 2 Effects*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF</td>
<td>8</td>
<td>-3.1</td>
<td>36.4</td>
<td>-0.24</td>
<td>0.815</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP</td>
<td>8</td>
<td>6.25</td>
<td>22.16</td>
<td>0.80</td>
<td>0.451</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP</td>
<td>8</td>
<td>15.6</td>
<td>29.7</td>
<td>1.49</td>
<td>0.180</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH</td>
<td>8</td>
<td>-6.25</td>
<td>18.47</td>
<td>-0.96</td>
<td>0.370</td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCS</td>
<td>8</td>
<td>0.38</td>
<td>6.05</td>
<td>0.18</td>
<td>0.865</td>
</tr>
</tbody>
</table>

Note. *N* = number; *M* = Mean; *SD* = Standard Deviation; *t* = test statistic; *p* = probability; PF = Physical Function; RP = Role Physical; BP = Bodily Pain; GH = General Health; PCS = Physical Component Summary
Table 5

*Short Form 12 version 2 Effects*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT</td>
<td>7</td>
<td>7.1</td>
<td>27.8</td>
<td>0.68</td>
<td>0.522</td>
</tr>
<tr>
<td>SF</td>
<td>8</td>
<td>12.5</td>
<td>29.9</td>
<td>1.18</td>
<td>0.275</td>
</tr>
<tr>
<td>RE</td>
<td>8</td>
<td>20.3</td>
<td>36.6</td>
<td>1.57</td>
<td>0.160</td>
</tr>
<tr>
<td>MH</td>
<td>8</td>
<td>11.02</td>
<td>24.65</td>
<td>1.26</td>
<td>0.246</td>
</tr>
<tr>
<td>MCS</td>
<td>8</td>
<td>6.71</td>
<td>11.98</td>
<td>1.59</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Note. \( N = \) number; \( M = \) Mean; \( SD = \) Standard Deviation; \( t = \) test statistic; \( p = \) probability; VT = Vitality; SF = Social Functioning; RE = Role Emotional; MH = Mental Health; MCS = Mental Component Summary
CHAPTER 5: DISCUSSION

Total Knee Arthroplasty (TKA) is the solution for many patients seeking to resolve life altering knee pain. These patients may have improved functional outcomes if they are better prepared for the complexities of TKA recovery through presurgical educational intervention. Instruction from health care professionals may play a significant role in the development of patients’ outcome expectancies (Sullivan et al., 2011).

Dorothea Orem’s Self-Care Deficit nursing theory encourages patients to develop methods to overcome limitations to meet their personal goals and needs. Orem (2001) suggests phases of action in self-care to achieve personal goals and needs. Patients who have completed the phases of action and have committed to TKA have certainly developed perceptions and expectations. The desire to overcome limitations from knee dysfunction is a powerful motivator for TKA surgery.

There are many nursing implications for presurgical education. Patients’ expectations for TKA would be more realistic if they received comprehensive joint education prior to surgery. A winning situation is created by the patient gaining appropriate knowledge pre-TKA, therefore being better prepared for the complexities of TKA recovery.

Various studies have sought to explain the need for presurgical educational intervention to improve outcome expectancies after TKA. The purpose of this quantitative study was to identify if patients’ perceptions of their functional abilities prior
to TKA were similar to their actual post-operative functional abilities at 4 to 6 weeks post TKA, if they attended an educational joint replacement class prior to surgery. This investigation sought to extend the research on educational instruction from health professionals prior to TKA to assess changes in patients’ functional outcomes.

The Knee Outcome Survey, Activity of Daily Living Scale (KOS-ADLS) questionnaire was used to measure the functional limitations and symptoms that occur during activities of daily living. Functional limitations included how the knee affected their ability to walk, go up and down stairs, stand, kneel, squat, sit with the knee bent, and rising from a chair. Symptoms included to what degree knee pain, stiffness, swelling, shifting of the knee, weakness, and limping affected their level of daily activity.

The participants’ scores improved from pre-test to post-test reaching statistical significance. This may have occurred because following TKA, several symptoms improved; such as, reduction in pain, swelling, and weakness of the knee. Many participants stated they had a decrease in arthritic knee symptoms: giving way, buckling or shifting of the knee as well as a decrease in weakness post TKA. None of the participants were able to kneel on the front of their knee after surgery, as this is not allowed post TKA. Many participants stated they had minimal experience with going up and down stairs post TKA, as they were only four weeks post TKA and physical therapy was actively working with them on accomplishing this task. One male participant had unusual pre-test and post-test results. He reported worsening of symptoms before and after surgery. But, his unusual results did not impact the improvement scores in symptoms and functional limitations overall.
Mizner et al. (2011) had similar results in their study of 100 (52% male, 48% female) patients one month post-TKA. They discovered, using the KOS-ADLS, that there was significant improvement in knee symptoms and function. Their participants reported functional limitations due to pain, and the knee giving way and limping was significantly less four weeks post-TKA.

Age of participants was not a significant predictor of symptoms and functional limitation, but gender was. The difference in scores between the pre and post-test means was greater for women than men. This finding was still evident when the data were re-analyzed omitting the unusual participant’s score. These findings may be evident because more women participated in this study. This difference may have been ameliorated if the sample size had been larger or perhaps there is something uniquely different related to recovery from TKA based on gender. Similar findings were found in other research with larger sample sizes. Research by Hepinstall et al. (2011) indicated that younger patients and men had higher expectations before TKA than older patients and women. The sample population ($N = 1943$) in the Hepinstall et al. (2011) study was quite large with 61.1% ($n = 1187$) female and 38.9% ($n = 756$) male participants. However, Sullivan et al. (2011) researched the role of presurgical expectancies, such as pain and physical function, of TKA patients ($N = 120$). They discovered that women ($n = 73$) and men ($n = 47$) did not vary in their scores with respect to age.

The Short Form 12 version 2 (SF-12 v2) questionnaire assessed components of physical and mental health. Physical health measured a combination of physical functioning, role-physical, general health, bodily pain, and physical component summary. Three of the five physical health components had positive change from pre-test to
post-test; however, these changes were not statistically significant. The three areas that had positive changes were role-physical (accomplishing less than desired or limitations in regular daily activity), bodily pain (how much pain interfered with normal activities), and the physical component summary (a compilation of all the areas covered under physical health: physical functioning, role-physical, general health, and bodily pain). The worsening in role-physical and bodily pain may be due to the immediate post-operative recuperative period after TKA as they completed the post-test only four weeks after TKA.

Similar research by Razmjou et al. (2009) and Nilsdotter et al. (2009) both stated patient relationships linked physical and mental health to patient expectations of improved abilities with activities of daily living and high expectations for recovery. Razmjou et al. studied candidates ($N = 331$) for TKA and discovered expectation of pain relief was associated with comorbidity. Patients without comorbidity reported lower expectations. They also discovered patients with lower comorbidity reported higher mental health expectations of improved activities of daily living. Nilsdotter et al. (2009) obtained results from patients ($N = 102$) that indicated higher expectations of physical abilities regarding leisure activities pre-TKA were associated with a higher level of leisure activity and walking ability post-TKA.

Mental health assessed a combination of vitality (to what extent a patient feels energized), social functioning (how much physical or emotional problems cause difficulty with normal social activity), role-emotional (how much work or regular activities were able to be performed and how accurately), mental health (how the patient was feeling), and mental component summary. The mental component summary is a
combined scoring of the mental health components (vitality, social functioning, role-emotional, and mental health). All of the mental health components had positive change; however, they failed to reach statistical significance. All of these changes were in the direction of worse health. Participants continued to require assistance with many routine activities; such as, ambulating with an assistive device and stair climbing. All attended physical therapy and were not able to drive. None of the participants have been medically cleared to drive. Again, the change in results towards a temporary decline in health may have been influenced by the fact that the participants were only four weeks post-TKA and continued to have limitations in their daily activities. Sullivan et al. (2011) also discovered behavioral outcome expectancies correlated with pain severity and functional limitations.

According to DePuy Orthopedics (2013), usual levels of functioning at 4 to 6 weeks post-TKA include discontinuation of walking with assistive devices and resuming driving as long as the person is able to perform an emergency stop. While the patient continues with physical therapy to build knee strength and flexibility, many activities are usually resumed at 6 to 12 weeks post-TKA; such as, swimming, golf, boating, and doubles tennis (2013).

**Limitations**

There were numerous limitations to this research. They included difficulties with measuring the influence of the educational joint replacement class on functional abilities, small sample size, and the two different methods (self-completion and telephone interview) that data was collected from participants. While the two instruments, KOS-ADLS and SF-12 v2, are valid and reliable tools, neither was able to answer the question
of whether education influenced post-operative outcomes. A more specific instrument for measuring changes in outcome based on the educational intervention should have been used.

A second limitation was related to the sample size. The post-test sample size was limited due to time constraints of the researcher for follow-up. There were not enough participants to effectively observe any significant change. A small sample size has limited power to detect change. A larger sample size, as indicated by the post-hoc power analysis, may have resulted in a different outcome. This would have necessitated data collection beginning earlier with more participants recruited.

The third limitation was that patients independently completed the pre-test. However, the post-test was a telephone interview and did not allow participants to see the questions. This may have caused participants to not fully understand the question as stated to them, as they had been allowed to read the questions at the pre-test prior to the educational joint replacement class. This may have resulted in participants answering the questions differently since the questions were read to them.

A fourth limitation was that participants were only followed up for post-test at 4 to 6 weeks. The study would have been stronger if a repeated measures design was used; collecting data at 8 and 12 weeks post TKA. This would have allowed participants to have had a longer opportunity for physical healing and perhaps more measurable changes. If many of these changes had been made prior to the start of the study, there may have been more measurable, observable changes in outcome.
Implications for Nursing Practice and Recommendations for Future Research

Implications for nursing practice includes patients’ being better educated prior to TKA surgery so that they may have more realistic post-operative perceptions of their functional abilities after attending an educational joint replacement class. Patients’ perceptions after TKA may be influenced by the educational joint replacement class.

Based on the results of the study, there are several recommendations for future research. Instrument selection is vital to measuring educational intervention outcomes. This study did not accurately measure how the educational joint replacement class influenced participants’ post-operative perceptions of physical and mental function. Perhaps development of a different type of instrument could effectively measure changes related to a joint replacement education intervention. Another opportunity to improve results would be to implement the study with at least six months of data collection. To better identify if education makes a difference, data collection should be expanded to include TKA patients (an additional group) who did not attend a joint replacement class. This would be a two group repeated measures design. Therefore, the researcher could analyze the effects of an educational intervention on TKA participants who attend an educational joint replacement class compared to TKA participants who did not attend an educational joint replacement class. This would be a better approach to measure the effect of a joint replacement class education intervention.
Conclusions

Several conclusions can be made from the results of this study. The first conclusion is that there were statistically significant changes between the pre-test and post-test scores of the KOS-ADLS indicating improvement in knee symptoms and functional abilities. Secondly, women scored differently than men on the KOS-ADLS. Lastly, there were no statistically significant changes in the test results of the SF-12 v2. Although three of the five physical components and all five mental health components had positive changes that indicated worsening or declining health from pre-test to post-test which may be attributed to the short four week follow up. Results may have been different with repeated follow-up at eight and twelve week post-TKA as participants return to their normal levels of activity.

Patients develop expectations and outcome beliefs prior to TKA as evidenced by the results of KOS-ADLS and SF-12 v2 pre-test and post-test. Muniesa et al. (2010) discovered that patients expected improvement in pain and functional activities, which this study identified as well using the KOS-ADLS. The results from SF-12 v2 suggested that patients had higher expectations for physical and mental improvement than they actually achieved from pre-TKA to post-TKA. The participants in this study generally had higher expectations than their actual post-operative outcomes. The comprehensive joint replacement education class may not have completely prepared the participants for the realities of functional abilities after TKA.

Implications from data analysis that would have benefited the study indicate the use of different measurement tools to analyze education effects on TKA outcomes. The instruments, KOS-ADLS and SF-12 v2, were appropriate for measuring physical and
mental health changes pre-TKA and post-TKA; but there was not a specific instrument to measure the impact of the educational joint replacement class on patient perceptions. Pre-operative comprehensive joint education was given to all participants, but there was no educational follow-up by the educational joint replacement class instructors to answer or clarify patient questions post-TKA. In the future, TKA patients would benefit from pre-operative joint replacement education with the addition of follow-up at 4, 6 and 8 weeks post-TKA to assess if further education needs to occur so that patients can experience a realistic post-operative outcome.
References


Appendix A

Informed Consent
SIGNED CONSENT FORM

Title of Research Study: Patient perspectives after total knee arthroplasty

Researcher’s Contact Information: Stephanie A. Jones BSN, RN
stephanie.jones3708@gmail.com
Cell phone 404-863-0094

Dr. Gloria Taylor (Faculty advisor)
gtaylor@kennesaw.edu
Phone: 770-423-6590

Introduction

You are being invited to take part in a research study conducted by Stephanie Jones of Kennesaw State University. Before you decide to participate in this study, you should read this form and ask questions about anything that you do not understand.

Description of Project

The purpose of this study is to discover how the educational joint replacement class offered at Gwinnett Medical Center-Lawrenceville or Gwinnett Medical Center-Duluth affects a participant’s perceptions related to post-operative functional abilities. Functional abilities are a combination of physical health and mental health; for example, climbing stairs, limitations in daily activity, pain with activities, how energized you feel, and how much physical or emotional troubles can interfere with normal social activity. A participant’s perceptions of their current functional abilities will be assessed prior to the start of the educational joint replacement class by the researcher. Four to six weeks after surgery, the researcher will contact participants, by telephone, and assess their post-operative perceptions of functional abilities to determine if their perceptions have changed.

Explanation of Procedures

If you decide to participate, you will be asked to complete a short demographic questionnaire consisting of 9 questions, the Activities of Daily Living Scale (ADLS) consisting of 14 questions, and the Short-Form 12 version 2 (SF-12 v2) consisting of 12 questions. The demographic questionnaire will contain questions regarding gender, age, language spoken, race, marital status, highest level of education completed, work situation, estimated surgery date, and estimated household income. The ADLS is a 14-item questionnaire that inquires about patients’ knee symptoms and its effect on their functional limitations during activities of daily living (for
example, getting in and out of the car, going up and down stairs, walking in the grocery store, etc.). The SF-12 v2 is a 12-item questionnaire that inquires about functional abilities, a combination of physical (e.g., difficulty ambulating) and mental health (e.g., depressed or anxious) components. It should take approximately 10-15 minutes to complete all of the questionnaires prior to your participation in the joint replacement class. There will be no further contact by the researcher until 4-6 weeks following your surgery. At that time, the researcher will contact you by telephone and ask you some questions about the outcome of your surgery and reassess your functional abilities using the ADLS and SF-12 v2 questionnaires. Prior to the researcher’s call, you will be sent a reminder regarding the date and time of the follow-up phone call. The telephone call will take about 10-15 minutes of your time.

**Time Required**

The time required of the participant is approximately 10-15 minutes to complete the demographic form and questionnaires (functional abilities) prior to the joint replacement class. Four to six weeks following surgery, there will be a follow up telephone call that will last approximately 10-15 minutes.

**Risks or Discomforts**

There are no physical risks for taking part in this study. You may experience uncomfortable feelings by answering some of the questions on the questionnaires as some of the information may feel personal. However, participants have the right to refuse to respond to any question that they feel may be an invasion of privacy.

**Benefits**

There may be no direct benefit to you to for participating in this study. But, your participation will help the researcher identify areas that may provide further knowledge and understanding of patient perceptions related to total knee replacement before and after surgery.

**Compensation**

If you complete both assessments of the study, you will have the opportunity to participate in a random drawing (using your assigned study number only) for a $25.00 Visa gift card. Eligibility for the random drawing includes completing both the initial assessment at the educational joint replacement class and the telephone follow-up assessment. The random drawing consists of eligible participants having their study number placed in a fish bowl at the completion of the study; one study number will be randomly drawn from the fish bowl by someone not associated
with the research. The winner will be notified by telephone no later than November 22, 2013 and the Visa gift card mailed to the address provided for this study.

Confidentiality

The results of your participation will be anonymous. You will not be identified personally. Each participant will be assigned a study number and personal contact information will be kept separate from the assessment data. Following enrollment all data will be managed by the participant’s study number only. All results of the research will be reported in group form without any identifying information. The information you provide will only be shared with individuals directly involved in the research study. You maintain all of your rights while participating in the study. All paper data (assessment forms) containing participants’ responses will be entered into a computer program for analysis, password protected. During the study all paper data will be secured in a locked file cabinet in the researcher’s office at Gwinnett Medical Center-Duluth when not being used. At the end of the study, all paper data will be destroyed using the official document destruction system of Gwinnett Medical Center-Duluth. Also, computer data will be transferred to a password protected flash drive that will be secured in a locked file cabinet in the researcher’s office at Gwinnett Medical Center-Duluth when not being used. All information will be deleted from the computer after transfer to the flash drive at the end of the study. Electronic data will be archived in a locked/secured file cabinet for only 3 years following the close of the study and then destroyed by the hospital approved document destruction system at Gwinnett Medical Center-Duluth. At no time will any personal data be shared with anyone who is not directly involved in this research study.

Inclusion Criteria for Participation

Participants in the study must be 40 years of age or older, electing to have a total knee arthroplasty (one knee only), English speaking, and enrolled in the educational joint replacement class at Gwinnett Medical Center-Lawrenceville or Gwinnett Medical Center-Duluth campus.

Signed Consent

I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.

__________________________________________________
Signature of Participant or Authorized Representative, Date
Signature of Investigator, Date

PLEASE SIGN BOTH COPIES OF THIS FORM, KEEP ONE AND RETURN THE OTHER TO THE INVESTIGATOR

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 1000 Chastain Road, #0112, Kennesaw, GA 30144-5591, (678) 797-2268.
Appendix B

Demographic Questionnaire
Demographic Questionnaire

1. What is your gender? □ Male □ Female

2. What is your age? ______________

3. What is your anticipated date of surgery? _________________

4. What language do you prefer to speak? (CHECK only one)
   □ English □ Spanish
   □ Other, please specify: ____________________________

5. What best describes your race? (CHECK only one)
   □ African American/Black □ European American/White
   □ Multi-racial, please specify: _____ □ Asian American/Asian
   □ Native American/American Indian/Alaskan Native

6. What is your marital status? (CHECK only one)
   □ Single □ Married
   □ Not married but living with partner □ Separated
   □ Divorced □ Widowed

7. What is your highest level of education completed? (CHECK only one)
   □ Grade school or less □ Some college
   □ Some high school □ Completed four years of college (received degree)
   □ Graduated high school/GED □ Master’s degree
   □ Technical or trade school □ Doctorate degree
   □ Other, please specify: ____________________________

8. What best describes your current work situation? (CHECK only one)
   □ Employed full-time □ Not working, on disability
   □ Employed part-time □ Homemaker/Caregiver
   □ Not working-looking for work □ Other, please specify: _________
   □ Retired

9. What is your household’s estimated yearly income before taxes? (CHECK only one)
   □ <$30,000
☐ $30,000 - $50,000
☐ $51,000 - $70,000
☐ >$70,000
Appendix C

Knee Outcome Survey Activities of Daily Living Scale
**Knee Outcome Survey**  
**Activities of Daily Living Scale**

**Instructions:**

The following questionnaire is designed to determine the symptoms and limitations that you experience because of your knee while you perform your usual daily activities. Please answer each question by checking the one statement that best describes you over the last 1 to 2 days. For a given question, more than one of the statements may describe you, but please mark only the statement which best describes you during your usual daily activities.

**Symptoms**

To what degree does each of the following symptoms affect your level of daily activity? (check one answer on each line)

<table>
<thead>
<tr>
<th></th>
<th>I Do Not Have the Symptom</th>
<th>I Have the Symptom But It Does Not Affect My Activity</th>
<th>The Symptom Affects My Activity Slightly</th>
<th>The Symptom Affects My Activity Moderately</th>
<th>The Symptom Affects My Activity Severely</th>
<th>The Symptom Prevents Me From All Daily Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stiffness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giving Way, Buckling or Shifting of Knee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weakness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Functional Limitations with Activities of Daily Living**

How does your knee affect your ability to... (check one answer on each line)

<table>
<thead>
<tr>
<th></th>
<th>Activity Is Not Difficult</th>
<th>Activity is Minimally Difficult</th>
<th>Activity is Somewhat Difficult</th>
<th>Activity is Fairly Difficult</th>
<th>Activity is Very Difficult</th>
<th>I am Unable to Do the Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go up stairs?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go down stairs?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kneel on the front of your knee?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sit with your knee bent?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rise from a chair?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix D

Short Form 12 version 2
Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Thank you for completing this survey!

For each of the following questions, please mark an ☒ in the one box that best describes your answer.

1. In general, would you say your health is:

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
</tbody>
</table>
   □ 1, □ 2, □ 3, □ 4, □ 5

2. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

   - Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf: □ 1, □ 2, □ 3
   - Climbing several flights of stairs: □ 1, □ 2, □ 3

SF-12v2 Health Survey © 1994, 2002 Medical Outcomes Trust and QualityMetric Incorporated. All rights reserved.
SF-12v2 is a registered trademark of Medical Outcomes Trust.
(H-12v2 Health Survey Standard, United States (English))
3. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
</tbody>
</table>

- Accomplished less than you would like ........................................... □ 1 ........................ □ 2 ........................ □ 3 ........................ □ 4 ........................ □ 5

- Were limited in the kind of work or other activities .......................... □ 1 ........................ □ 2 ........................ □ 3 ........................ □ 4 ........................ □ 5

4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
</tbody>
</table>

- Accomplished less than you would like ........................................... □ 1 ........................ □ 2 ........................ □ 3 ........................ □ 4 ........................ □ 5

- Did work or other activities less carefully than usual .......................... □ 1 ........................ □ 2 ........................ □ 3 ........................ □ 4 ........................ □ 5

5. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little bit</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
</tr>
</tbody>
</table>

□ 1 □ 2 □ 3 □ 4 □ 5
6. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

<table>
<thead>
<tr>
<th></th>
<th>All of the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you felt calm and peaceful?</td>
<td>□ 1...................</td>
<td>□ 2...............</td>
<td>□ 3...............</td>
<td>□ 4............</td>
<td>□ 5</td>
</tr>
<tr>
<td>Did you have a lot of energy?</td>
<td>□ 1...................</td>
<td>□ 2...............</td>
<td>□ 3...............</td>
<td>□ 4............</td>
<td>□ 5</td>
</tr>
<tr>
<td>Have you felt downhearted and depressed?</td>
<td>□ 1...................</td>
<td>□ 2...............</td>
<td>□ 3...............</td>
<td>□ 4............</td>
<td>□ 5</td>
</tr>
</tbody>
</table>

7. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

<table>
<thead>
<tr>
<th></th>
<th>All of the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
</tbody>
</table>

Thank you for completing these questions!
Appendix E

Permission to use Knee Outcome Survey Activities of Daily Living Scale
Thank you for contacting me. You have my permission to use the Knee Outcome Survey for your study. I have attached a copy of the Activities of Daily Living Scale and scoring instructions for your use. Best of luck with your study.

Jay

James J. Irrgang PT PhD ATC FAPTA
Associate Professor and Director of Clinical Research
Department of Orthopaedic Surgery
University of Pittsburgh School of Medicine
Phone: (412) 605-3351
Fax (412) 687-3724

This e-mail may contain confidential information of the sending organization. Any unauthorized disclosure, copying, or distribution, or use of the contents of this e-mail and attached document(s) is prohibited. The information contained in this e-mail and attached document(s) is intended only for the personal and confidential use of the recipient(s) named above. If you have received this communication in error, please notify the sender immediately by e-mail and delete the original e-mail and attached document(s).

From: Stephanie Jones [mailto:jones3707@bellsouth.net]
Sent: Wednesday, April 17, 2013 6:53 AM
To: Irrgang, James
Cc: jirrgang@pitt.edu
Subject: knee outcome survey question

Dr. Irrgang,

I am a graduate student at Kennesaw State University in the Master of Science in Nursing program-Nursing Education and am working on my thesis. My thesis would benefit from being able to use your Knee Outcome Survey. My hypothesis is as follows: Patients' perceptions of their post-operative functional abilities prior to total knee replacement will be similar to their actual post-operative functional abilities at 4-6 weeks if they attend an educational joint replacement class prior to surgery. I would like to use your Knee Outcome Survey as well as the SF-12 (which I am working on permission to use) for my study. Are you the correct person to ask for permission to use the Knee Survey?

Thank you,

Stephanie A. Jones RN, BSN
Appendix F

Short Form 12 version 2 Telephone Questionnaire
**SF-12v2® HEALTH SURVEY (FOUR-WEEK RECALL)**

**SCRIPT FOR INTERVIEW ADMINISTRATION**

This first question is about your health now.

Please try to answer as accurately as you can.

1. **In general, would you say your health is...**
   
   [READ RESPONSE CHOICES]

   (Circle one number)

   Excellent .................................................. 1

   Very good .................................................. 2

   Good ......................................................... 3

   Fair .......................................................... 4

   or Poor ....................................................... 5

Now I'm going to read a list of activities that you might do during a typical day.

As I read each item, please tell me if your health now limits you a lot, limits you a little, or does not limit you at all in these activities.

2a. **... moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf. Does your health now limit you a lot, limit you a little, or not limit you at all?**

   [READ RESPONSE CHOICES ONLY IF NECESSARY]

   [IF RESPONDENT SAYS S/HE DOES NOT DO ACTIVITY, PROBE: Is that because of your health?]

   (Circle one number)

   Yes, limited a lot ....................................... 1

   Yes, limited a little .................................... 2

   No, not limited at all .................................. 3

2b. **... climbing several flights of stairs. Does your health now limit you a lot, limit you a little, or not limit you at all?**

   [READ RESPONSE CHOICES ONLY IF NECESSARY]

   [IF RESPONDENT SAYS S/HE DOES NOT DO ACTIVITY, PROBE: Is that because of your health?]

   (Circle one number)

   Yes, limited a lot ....................................... 1

   Yes, limited a little .................................... 2

   No, not limited at all .................................. 3
The following two questions ask you about your physical health and your daily activities.

3a. During the past four weeks, how much of the time have you accomplished less than you would like as a result of your physical health? [READ RESPONSE CHOICES]

(Circle one number)

All of the time ................................................................. 1
Most of the time .............................................................. 2
Some of the time ............................................................. 3
A little of the time ........................................................... 4
or None of the time ........................................................... 5

3b. During the past four weeks, how much of the time were you limited in the kind of work or other regular daily activities you do as a result of your physical health? [READ RESPONSE CHOICES]

(Circle one number)

All of the time ................................................................. 1
Most of the time .............................................................. 2
Some of the time ............................................................. 3
A little of the time ........................................................... 4
or None of the time ........................................................... 5

The following two questions ask about your emotions and your daily activities.

4a. During the past four weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems, such as feeling depressed or anxious? [READ RESPONSE CHOICES]

(Circle one number)

All of the time ................................................................. 1
Most of the time .............................................................. 2
Some of the time ............................................................. 3
A little of the time ........................................................... 4
or None of the time ........................................................... 5
4b. During the past four weeks, how much of the time did you do work or other regular daily activities less carefully than usual as a result of any emotional problems, such as feeling depressed or anxious? [READ RESPONSE CHOICES]  
(Circle one number)  
All of the time ....................................................................................................................... 1  
Most of the time .................................................................................................................... 2  
Some of the time ................................................................................................................ 3  
A little of the time .............................................................................................................. 4  
or None of the time ........................................................................................................... 5

5. During the past four weeks, how much did pain interfere with your normal work, including both work outside the home and housework? Did it interfere... [READ RESPONSE CHOICES]  
(Circle one number)  
Not at all .............................................................................................................................. 1  
A little bit .............................................................................................................................. 2  
Moderately .......................................................................................................................... 3  
Quite a bit ............................................................................................................................. 4  
or Extremely ...................................................................................................................... 5

The next questions are about how you feel and how things have been with you during the past four weeks.

As I read each statement, please give me the one answer that comes closest to the way you have been feeling: is it all of the time, most of the time, some of the time, a little of the time, or none of the time?

6a. How much of the time during the past four weeks... have you felt calm and peaceful? [READ RESPONSE CHOICES ONLY IF NECESSARY]  
(Circle one number)  
All of the time ...................................................................................................................... 1  
Most of the time .................................................................................................................. 2  
Some of the time ................................................................................................................ 3  
A little of the time ............................................................................................................. 4  
or None of the time ........................................................................................................... 5
6b. **How much of the time during the past four weeks... did you have a lot of energy?**  
*Read response choices only if necessary*  
(Circle one number)

- All of the time......................................................................................... 1
- Most of the time..................................................................................... 2
- Some of the time................................................................................... 3
- A little of the time................................................................................. 4
- None of the time................................................................................... 5

6c. **How much of the time during the past four weeks... have you felt downhearted and depressed?**  
*Read response choices only if necessary*  
(Circle one number)

- All of the time......................................................................................... 1
- Most of the time..................................................................................... 2
- Some of the time................................................................................... 3
- A little of the time................................................................................. 4
- None of the time................................................................................... 5

7. **During the past four weeks, how much of the time has your physical health or emotional problems interfered with your social activities like visiting with friends or relatives? Has it interfered...**  
*Read response choices*  
(Circle one number)

- All of the time......................................................................................... 1
- Most of the time..................................................................................... 2
- Some of the time................................................................................... 3
- A little of the time................................................................................. 4
- None of the time................................................................................... 5
Appendix G

Quality Metric License Agreement
NON-COMMERCIAL LICENSE AGREEMENT
Office of Grants and Scholarly Research (OGSR)

License Number: QM019125
Effective Date: 08/01/13
Licensee Name: Stephanie Jones
Licensee Address: 1928 Tribble Valley Drive Lawrenceville, Georgia 30045
Approved Purpose: Non-commercial academic research and/or thesis – Unfunded Student.
Study Name: Patient perspectives after Total Knee Replacement
Study Type: Thesis/Dissertation Only
Therapeutic Area: Mental Health and Behavior
Royalty Fee: None, because this License is granted in support of the non-commercial Approved Purpose
Other Definitions: As indicated on Appendix B "License Agreement – Details", including without limitation: Licensed Surveys, Modes, Fees, Administrations, Services, Approved Languages and (if applicable) License Term

Licensee accepts and agrees to the terms of this Non-Commercial License Agreement (the "Agreement") from the Office of Grants and Scholarly Research (OGSR) of OptumInsight Life Sciences, Inc. (f/k/a QualityMetric Incorporated) ("OptumInsight") as of the Effective Date.

Subject to the terms of this Agreement, including the OptumInsight Non-Commercial License Terms and Conditions attached as Appendix A: OptumInsight grants to Licensee, and Licensee accepts, a non-exclusive, non-transferable, non-assignable, non-sublicensable worldwide license to use, solely for the Approved Purpose and during the License Term, the Licensed Surveys in the authorized Modes and Approved Languages indicated on Appendix B and to administer the Licensed Surveys only up to the approved number of Administrations (and to make up to such number of exact reproductions of the Licensed Surveys necessary to support such Administrations) in any combination of the specific Licensed Surveys and Approved Languages and Modes and to use any related software provided by OptumInsight.

Capitalized terms used in this Agreement shall have the meanings assigned to them above, or in Appendices A and B attached hereto. Appendices A and B attached hereto are incorporated into and made a part of this Agreement for all purposes.

EXECUTED, as of the Effective Date, by the duly authorized representatives as set forth below.

OptumInsight Life Sciences, Inc. [OptumInsight]
Signature: [Signature]
Name: G. Gardner
Title: President and COO
Date: 20 May 2013

Stephanie Jones [Licensee]
Signature: [Signature]
Name: STEPHANIE A. JONES
Title: RN Graduate Student
Date: 5-16-13
Appendix H

Gwinnett Medical Center Office of Research approval
13 August 2013

Stephanie Jones, RN, BSN
1928 Tribble Valley Drive
Lawrenceville, GA 30045

RE: Pending Institutional Approval: Patient Perspectives after Total Knee Arthroplasty

Dear Ms. Jones:

The Gwinnett Hospital System (GHS) Office of Research has tentatively reviewed the above referenced study. We are pleased to inform you that pending IRB approval by Kennesaw State University, institutional approval will be issued. GHS’s institutional approval indicates that this study may utilize GHS services and satellite service providers as requested on your GHS Office of Research application.

• **Reportable New Research Information**: A Reportable New Research Information Form must be submitted for any of the following events:
  - Breach of Confidentiality
  - Subject complaint that cannot be resolved by the research team
  - Audits, inspections, or inquiry by a federal agency and any resulting reports
  - Unanticipated problems involving risks to subjects or others
  - Serious or continuing non-compliance with regulations or with the requirements or determinations of the IRB
  - Suspension or termination of the IRB approval
  - Requests by the Sponsor or Investigator to amend existing research contracts
  - Requests by the Sponsor or Investigator to amend existing research budgets or payment terms
  - Changes to research team membership

• **Additional Reporting Obligations**: Also, the study team is required to notify the GHS Office of Research regarding the following various issues:
  - Protocol amendments that change the procedures section of the protocol
  - Notification to the Institutional Review Board regarding study enrollment closure and study closeout / termination.

Please call the Office of Research at 678-312-3848 if you have any questions.

Sincerely,

Holly B. Richards
Director, Office of Research

1060 Medical Center Boulevard | Lawrenceville, GA 30046 | 678-312-1000 | gwinnetmedicalcenter.org
Appendix I

Institutional Review Board approval from Kennesaw State University
8/12/2013

Stephanie Jones, Student
KSU WellStar School of Nursing

RE: Your application dated 8/9/2013, Study #14-012: Patient Perspectives after Total Knee Arthroplasty

Dear Ms. Jones:

I have reviewed your application for the new study listed above. This study qualifies as exempt from continuing review under DHHS (OHRP) Title 45 CFR Part 46.101(b)(2) - educational tests, surveys, interviews, public observations. The consent procedures described are in effect. You are free to conduct your study.

Please note that all proposed revisions to an exempt study require IRB review prior to implementation to ensure that the study continues to fall within an exempted category of research. A copy of revised documents with a description of planned changes should be submitted to irb@kennesaw.edu for review and approval by the IRB.

Thank you for keeping the board informed of your activities. Contact the IRB at irb@kennesaw.edu or at (678) 797-2268 if you have any questions or require further information.

Sincerely,

Christine Ziegler, Ph.D.
Institutional Review Board Chair

cc: gtaylor@kennesaw.edu
Due to insufficient time to follow-up with some participants from my research, I need to modify Study #14-012: Patient Perspectives after Total Knee Arthroplasty. The reason is I will not be able to complete the follow-up assessments (post-tests) for nine participants because they had to delay their knee surgery. I did not become aware of this change until after enrollment. Typically, patients move ahead with surgery within a week of attending the joint education class, however, these participants did not. For example, after enrollment, one participant has delayed surgery until after Thanksgiving. Because this research is associated with my current course, I cannot complete the post-test assessments. All post-test assessments were scheduled four weeks following surgery and to date I have been able to complete the follow-up on 8 of the 17 participants enrolled.

My plan is to notify the nine participants of my inability to follow-up due to the time constraints, using the attached letter. To be fair to all who enrolled in good faith, I would like to modify the compensation, allowing all persons who participated in the pre-test portion of the study to be included in the random drawing for the $25 Visa gift card. The drawing is still scheduled for November 22, 2013. Thank you,

Stephanie A. Jones
November 14, 2013

Stephanie Jones, Student  
KSU WellStar School of Nursing

RE: Request for Revision to Exempted Study, Study #14-012: Patient Perspectives after Total Knee Arthroplasty

Dear Ms. Jones:

I have reviewed your request for revisions to the exempted study listed above, which involves the following change to the protocol: Addition of letter to be sent to nine participants that could not complete follow-up assessments. This study continues to qualify as exempt from review under DHHS (OHRP) Title 45 CFR Part 46.101(b)(2) - educational tests, surveys, interviews, public observations. You are free to conduct your study as approved.

Please note that any further proposed changes to the study must be promptly reported and approved prior to implementation. Contact the IRB at (678) 797-2268 or irb@kenesaw.edu if you have any questions or require further information.

Sincerely,

Christine Ziegler, Ph.D.  
Institutional Review Board Chair

cc: gtaylor@kennesaw.edu
Dear Mr./Mrs. ____________,

I am writing to inform you that I will be unable to contact you for your follow-up telephone call. I had to end my study after November 4, 2013. But, I am including your assigned study number in the random drawing for the $25 Visa gift card without the stipulation of having to complete both parts of the study. The drawing will occur on November 22, 2013, and I will mail the gift card to the winner at the address they provided. If you have questions please do not hesitate to contact me or my faculty advisor.

Thank you,

Stephanie A. Jones BSN, RN  
stephanie.jones3708@gmail.com  
Cell phone: 404-863-0094

Dr. Gloria Taylor (Faculty advisor)  
gtaylor@kennesaw.edu  
phone: 770-423-6590