Spring 4-22-2015

Improving Patient Satisfaction after Primary Total Knee Arthroplasty Using Nurse Practitioner-Driven Preoperative Education

Jennifer A. White
Otterbein University, jennifer.whiteCNP@gmail.com

Improving Patient Satisfaction after Primary Total Knee Arthroplasty Using Nurse Practitioner-driven Preoperative Education.

Presented in partial fulfillment
of the Requirements of the Degree
Doctor of Nursing Practice

By

Jennifer White BSN, MSN, RN, CNP
The Graduate School
Otterbein University
2015

Final Project Committee:

_____	_____
Professor Kay Ball, DNP Advisor	Date
_____	_____
Professor Kirk Hummer, Committee Member	Date
_____	_____
Vivek Sahai, MD, Committee Member	Date

Executive Summary/Abstract

Total joint arthroplasty is an undisputed option for relieving pain and improving the function of an arthritic joint. The number of patients undergoing total knee arthroplasty (TKA) annually is expected to increase by 600% in the next two decades (Lau, Gandhi, Mahomed, & Mahomed, 2012). Current research shows that while 81-89% of patients who have had a TKA are satisfied postoperatively, there is room to improve patient satisfaction by providing further education preoperatively. While research cannot agree on a single, specific variable that influences patient dissatisfaction, a review of the literature shows that patients repeatedly note their "unmet expectations" as a factor that negatively influences their satisfaction. Research has also shown that the patient satisfaction scale created by Mahomed, Gandhi, Daltroy, and Katz (2011) is a reliable and validated tool for assessing patients' satisfaction after undergoing a total knee. Nurse practitioners can be utilized preoperatively to provide education to patients regarding realistic expectations and expected outcomes. This study's aim is to compare the 12-week postoperative satisfaction scores of patients undergoing primary TKA to determine if preoperative teaching by a nurse practitioner improves postoperative satisfaction.

Improving Patient Satisfaction after Primary Total Knee Arthroplasty Using Nurse Practitioner-driven Preoperative Education

Introduction

According to the Centers for Disease Control and Prevention (CDC) (2014), within the population of the United States, osteoarthritis (OA) affects 240 out of every 100,000 people over the age of nineteen. Osteoarthritis of the knee is one of the top five leading causes of disability, and accounts for approximately 500 deaths per year (CDC, 2014). Total joint replacement is an undisputed option for relieving pain and improving the function of an arthritic joint (Bullens, van Loon, Melefijt, Laan, & Veth, 2001). From 1991 to 2007, the rate of total knee arthroplasty (TKA) increased by 187% (CDC, 2014). This number is expected to increase by more than 600% in the United States over the next twenty years (Lau, Gandhi, Mahomed, & Mahomed, 2012).

In 2012, Medicare began reducing its payments to hospitals by 1.25 percent. This seemingly small amount added up to over $1 billion that Medicare then distributed to hospitals as bonuses for high patient satisfaction scores (Rau, 2013). This redistribution of money was added to the Affordable Care Act as a means to shift the medical industry's focus from quantity to quality. Patient satisfaction is worth measuring, not only for monetary reimbursement, but also because quite often physicians' (objective) and patients' (subjective) ways of evaluating health outcomes can greatly differ (Bourne, Chesworth, Davis, & Mahomed, 2010). For example, an orthopedic surgeon may be satisfied with his or her placement of a TKA if the x-rays show proper implant alignment and the patient is able to flex his or her knee beyond 90 degrees on physical exam. Patients, however, may feel unsatisfied with his or her TKA because they still have knee pain with their favorite activities and they don't like the appearance of their scar. These different means of satisfaction illustrate that the priorities and concerns between the physicians and patients are not always aligned (Bullens et al., 2001).

Significance/Background

According to the Agency for Healthcare Research and Quality (2006), the number of patients admitted to the hospital with a primary diagnosis of arthritis has more than doubled between the years of 1993 and 2006, from 362,000 to 754,000. Among patients admitted in 2006, 65% had a TKA performed during their stay (Agency for Healthcare Research and Quality, 2006). With such dramatic numbers, advanced practice nurses (APNs) will certainly be faced with caring for the arthritic population and have vast opportunities to affect and improve their outcomes.

There have been many studies performed that evaluate the satisfaction of patients after undergoing a primary TKA. While the satisfaction rate ranges from 81-89%, many studies report that patients are dissatisfied because their preoperative expectations are not met after surgery (Lau, Gandhi, Mahomed, & Mahomed, 2012). There have not been studies that discuss strategies on educating patients on reasonable preoperative expectations, thus improving their postoperative satisfaction. Advanced practice nurses already play a vital role in patient care and advocacy, and may be able to incorporate preoperative education techniques into their practice to improve patient satisfaction.

Literature Review

Many studies have evaluated and/or measured patient satisfaction after undergoing total knee arthroplasty (TKA). Several studies attempted to evaluate if satisfaction levels are independent of any other variables and unaffected by other perioperative events (Bourne et al., 2010; Lau et al., 2012). Bourne et al. (2010) note that patient satisfaction decreased when expectations were not met, when low preoperative and low 1-year postoperative Western Ontario and McMaster Universities Arthritis Index (WOMAC) scores were noted,

when there were complications requiring extended hospitalization postoperatively, and when patients had advanced age. Lau et al. (2012) reported the significance of evaluating patient satisfaction by using patient reported outcome measures (PROMs) as well as by trying to understand the different components that are integral to the patients' subjective satisfaction.

Other studies compare physician-satisfaction variables to PROMs and show that physician goals and priorities vary from the patients' quite drastically (Bullens, et al., 2001; Kwon et al., 2010). Bullens et al. (2001) describe physicians' measurements of success through objective clinical outcomes such as lack of postoperative complications, good prosthesis alignment, joint stability, and radiological results. Patients, however, feel most successful after TKA if they have improved functioning and decreased pain postoperatively (Bullens et al., 2001). The study by Kwon et al. (2008) determined that patient satisfaction correlated more with patient-derived questionnaires rather than physician-driven or generic testing measures.

Other studies that hypothesize that patient satisfaction is contingent upon the patient's ability to flex his or her operative knee beyond certain degrees. Narayan, Thomas and Kumar (2009) performed a study that compared patient satisfaction scores with the ability to flex the knee within certain ranges. Similarly, Devers et al. (2011) studied whether or not deep (greater than 130 degrees) knee flexion improved patient satisfaction. While the study by Devers et al. could not correlate flexion with satisfaction in any significant way, the authors note that patients' expectations were met, thus satisfying them postoperatively. Both studies did show that knee flexion, as a singular variable, did not improve overall satisfaction after TKA, even in cultures where sitting cross-legged and flexing the knee is a common cultural practice.

Other studies have tried to predict patient satisfaction or dissatisfaction based on patient co-morbidities, socioeconomic status, and generalized health. In one study, researchers hypothesized that patients with a poor socioeconomic status would have lower levels of satisfaction postoperatively (Clement et al., 2013). The results illustrated that, in fact, dissatisfaction after TKA increased in the presence components often linked to socioeconomic status. These components include increased amounts of co-morbidities and poor mental health, not the socioeconomic level itself (Clement et al., 2013). Clement and Burnett's (2013) study shows that patients who subjectively reported poor postoperative function and those with subpar improvements in their overall physical health were significantly less satisfied, despite their improved objective knee function. Furthermore, a third study shows that concomitant back pain independently predicted lower levels of satisfaction in patients after TKA (Clement, MacDonald, Simpson, & Burnett, 2013).

Another study focused on the relationship between the patients' postoperative satisfaction and their preoperative expectations. Nilsdotter, Toksvig-Larsen, and Roos (2009) began their study with the theory that the aging patients, namely those undergoing TKA, expect an active and healthy retirement. This desire for continued activity places higher demands on joint replacement outcomes. Patients in the study had preoperative expectations that included the ability to resume golfing and dancing, however only 14% of these patients were actually able to do so at the 5-year postoperative time (Nilsdotter, et al., 2009). Another preoperative expectation was that patients would have reduced joint pain, which in fact, most reported in their actual outcomes. The study did show that despite unmet expectations, patients were still generally satisfied with their surgical outcomes. This supported that satisfaction does not necessarily come from fulfillment of expectations, but rather, is a complex concept that is affected by many elements (Nilsdotter, et al., 2009). Contrarily, the study by Baker, van der Meulen, Lewsey, and Gregg (2007), found that their

patients' satisfaction levels were contingent on their preoperative expectations. The patients in this study had higher expectations of their pain relief than improved functional outcomes. The authors go on to note that patient priorities will vary worldwide and should not be generalized from this study alone. Overall, this study strongly encourages physicians to discuss realistic preoperative expectations with their patients prior to undergoing TKA. Going into the surgery with fact-based expectations could ultimately improve postoperative satisfaction (Baker et al., 2007).

An overall review of the literature illuminates many studies that focus on patient satisfaction after undergoing total knee arthroplasty. There is an array of factors that the literature link to levels of satisfaction: pre-existing back pain, knee flexion, postoperative function and/or pain control, socioeconomic status, and preoperative expectations. What is lacking is the use of any preoperative intervention that would improve postoperative satisfaction levels. This literature review also failed to uncover research that attempted to utilize APNs to improve patient satisfaction.

Physicians and nurse practitioners are working together at increasingly high rates, and both groups of professionals desire increased patient satisfaction. (Peterson, Phillips, Puffer, Bazemore, & Petterson, 2013). Nurse practitioners are outscoring physicians in patient-centered satisfaction surveys, proving that advanced practice nurses are gaining the trust of patients and are serving as validated healthcare providers (Furlow, 2011). The literature reveals an obvious need for intervention that improves patient satisfaction after TKA, and nurse practitioners have the clinical knowledge and patient advocacy skills to provide such an intervention.

While 81-89% satisfaction does show that patients are in strong favor of total knee arthroplasty postoperative results, there is room for improvement. As the number of surgeries performed each year increases, and as advancements are made in surgical

technique, providers should aim for the highest levels of patient satisfaction. Nurse practitioners are in a unique position to educate patients preoperatively and alleviate patients' concerns. Taking the time to discuss care and expectations with patients may serve as the intervention that improves patient satisfaction after undergoing a primary TKA.

Theoretical Framework

Created in 1995 and revised in 1997, the Theory of Unpleasant Symptoms (TOUS) provides a circular model of feedback that explains the experience of symptoms and how symptoms coexist together (Myers, 2009). There are three central components to the Theory of Unpleasant Symptoms: symptoms, influencing factors, and consequences of the symptoms experienced. Symptoms are defined as the patient's subjective awareness of a change in his or her normal functioning. Symptoms are typically unpleasant threats to the patient's health, and could include pain, stiffness, fatigue or swelling (Peterson & Bredow, 2013). Symptoms have internal influencing factors, such as their intensity, duration, quality and timing. There are also external influencing factors that are *antecedent* to the symptoms and include physiologic, psychological and situational factors. Both internal and external factors are interrelated and influence each other (Lenz, Pugh, Milligan, Gift, & Suppe, 1997).

Physiological factors represent the condition of the patient's body and mind in the presence of the symptom(s). For TKA patients, these factors include the functioning capacity of the patient's body (postoperative), pathologic occurrences (total knee arthroplasty), and the patient's energy level as it relates to his or her nutritional and hydration status (recovering from NPO status and blood loss). As the factors are all interrelated, compromising one factor often leads to other factors compensating to maintain the body's homeostasis. Without this balance, the body's energy levels will be

depleted. This is often seen in postoperative recovery when patients require elevated amounts of rest to regain energy.

Psychological factors involve the state of mental health, or the mood of the patient. It includes the patient's perception of his or her illness or symptoms, reaction to the symptoms, and interpretation why the symptoms exist. Situational factors influence symptoms through the social and physical environment of the patient. Financial burden, lack of a social support system, availability of resources and lifestyle behaviors can have a negative impact on symptoms (Lenz et al, 1997). This easily translates to postoperative TKA patients who are in a new environment (the hospital), have undergone elective surgery (a possible financial burden), and may be dependent on therapy or rehabilitation before going home (limited availability of resources). These changes have the potential to decrease patients' satisfaction postoperatively unless their expectations are met.

The third component of the theory is that of 'consequences of the symptom experience'. This includes the ideas of the 'outcome' or 'effect' of having experienced the symptoms. Symptoms will affect patients' performance of activities of daily living, their physical activity level, social interactions, and their ability to perform their required duties. Patients may struggle with concentration, problem solving, or expressing emotions in the presence of multiple or severe symptoms (Lenz et al, 1997). For the TKA patient, pain or decreased range of motion after surgery may lead him or her to require assistance with daily activities or become somewhat dependent on others during recovery.

Problem Statement/Purpose

Despite the dramatic increase in the number of patients undergoing TKAs each year, patient satisfaction remains unchanged at 81-89 percent. Utilizing nurse practitioners to

educate patients on reasonable expectations preoperatively may improve patient satisfaction scores postoperatively.

The purpose of this project was to improve patient satisfaction after undergoing total knee arthroplasty through the use of preoperative education by advanced nurse practitioners. The researcher determined if nurse practitioner-led education regarding realistic expectations for recovery did or did not improve patient satisfaction in the postoperative setting.

Method

This was a quantitative, quasi-experimental study in which two groups of patients' satisfaction were compared. Satisfaction was measured using the Mahomed patient satisfaction questionnaire, a reliable, validated, and patient-focused test. At the beginning of data collection, the control group of patients was given the Mahomed patient satisfaction questionnaire. They were between 10 and 14 weeks post TKA. The intervention group of patients had an educational session with the nurse practitioner preoperatively. The session involved educating patients on typical postoperative expectations and outcomes, and it allowed patients to ask questions or voice concerns about their care. Once the intervention group reached the 10-14 weeks postoperative period, the same Mahomed questionnaire was given to them. Their results were recorded and compared to the control group. The hypothesis was that patients who are educated on appropriate postoperative expectations and are able to discuss their surgical concerns would have greater satisfaction three months after surgery.

Instruments

The instrument utilized during this project was the "Patient Satisfaction Scale for Primary Hip and Knee Arthroplasty" (see Appendix) by Mahomed, Gandhi, Daltroy and Katz (2011). This scale was developed to evaluate the level of postoperative satisfaction experienced by patients who have undergone their first total knee or hip arthroplasty. The satisfaction scale is a 4-question test, with answers reported on a Likert Scale. During analysis this test was administered to 1700 patients at 12-weeks and 1-year postoperatively. Psychometric testing was performed on this tool to gauge its internal consistency and validity. Final measurements revealed a Cronbach's alpha of 0.86-0.92, which assesses the ability of the test to evaluate a one-dimensional concept (Mahomed et al., 2011). When assessing Cronbach's alpha, scores of 0.8 or greater are labeled "good" while scores over 0.9 are deemed "excellent." Mahomed's satisfaction scale is thus deemed reliable and consistent in measuring patient satisfaction.

Population/Sample

Convenience sampling was utilized for this study. Patient involvement was completely voluntary and each patient was given the opportunity to refuse both the questionnaire as well as the additional education at any point during the discussion. The study accessed all of the primary TKA patients of the collaborating total joint surgery practice. An estimated 6-8 patients underwent primary TKA each week, and the study spanned five weeks of care. This provided approximately 30-40 patients during the dedicated postoperative period for each of the control and intervention groups. Inclusion criteria included:

- Control group: must be within 10 and 14 weeks post-op from a primary TKA
- Intervention group: must be scheduled for a TKA within 10-14 weeks.
- Patients undergoing staged TKAs may not be a part of both the control and intervention groups.

- All patients must have had/scheduled a primary TKA, no revisions.
- Patient must be 18 years or older
- Patient must read/speak English and be able to provide informed consent.
- Patients must complete all questions of the survey entirely, using only the provided answer options. Incomplete surveys, or surveys where two or more answers are given for a single question will be disregarded.

Data Collection

To begin, a secure database was created to store patient information. Patients were assigned an identification number to avoid using any identifiable information. General demographic and surgical information were collected from each patient, including age, gender, race, BMI, type of TKA, and number of weeks post-TKA. These variables will not be used in the current research, but may be useful for future studies or analysis.

There are four questions that make up the aforementioned satisfaction scale, each with four possible answers (See Appendix). All patients in the control group had undergone a primary TKA within the last 10-14 weeks were contacted via telephone and given the survey. Intervention group patients who were to undergo TKA in 10-14 weeks were contacted via telephone for preoperative teaching regarding postoperative expectations. The information offered to the patients included education from the Center for Orthopedic Research and Education (CORE, n.d.). The researcher presented the following information in a scripted fashion, to assure that all patients received the same data:

- Over 90% of patients experience marked pain relief, but there may still be some residual pain to the surgical knee.
- TKA has been shown to help individuals return to common activities, but it is uncommon for patients to be able to perform more than what they were able to at baseline before surgery.
- High-impact activities such as jogging or high-impact sports may need to be avoided always.
- Every surgery has the risk of complications. TKAs may become infected and require a washout or revision. This occurs in less than 2% of patients. Some patients develop a blood clot in their surgical leg as well. These are complications that your surgeon is capable of managing, and patients will be monitored closely postoperatively.

- Average flexion for a TKA is 115°, but this can be reduced with scarring or if pre-surgery flexion was quite poor.
- Home planning is essential for easy transition after surgery. Recovery is a gradual process that may require help from others for a few weeks.

Project Implementation

Implementation of this project began with a single researcher conducting all telephone surveys and educational sessions. Research began on September 1, 2014, upon Otterbein University IRB approval. Patients were not made aware that they are part of a study involving satisfaction, so as not to bias their answers. They consented solely to undergo the preoperative education and postoperative questionnaire. Patients that were contacted had undergone primary total knee arthroplasty between May 26, 2014, and June 23, 2014. Fifty-five patients met the inclusion criteria. These patients were 10-14 weeks post primary TKA and acted as the control group. The patient satisfaction surveys were conducted via telephone and results were stored in a fingerprint-encrypted database.

Simultaneously, patients were identified who were scheduled to undergo primary TKA from September to October 2014. These patients were called and given the opportunity to receive education regarding postoperative expectations. These patients were invited to voice concerns and/or ask questions regarding their upcoming surgery. This group of patients served as the intervention group.

Once the intervention group had undergone TKA and were 10-14 weeks post-TKA, they were contacted via telephone and given the same satisfaction survey that the control group had previously taken. These results were stored in the same fingerprint-encrypted database. Statistical analysis began once all intervention group patients reached the appropriate postoperative time range and had been given the satisfaction survey. Percentage distributions and frequencies were evaluated and analyzed once all of the consenting patients had been surveyed.

The project budget included use the researcher's time placing phone calls, giving questionnaires, and providing education. There was a significant amount of time spent by the researcher collecting information and recording data. There were no capital costs, equipment or mailing costs. All contact was made via telephone and all data was stored electronically without cost. There were no recruitment inducements or incentives for patients to participate.

Data Analysis

Data analysis turns a spreadsheet full of numbers into meaningful data that can be utilized to transform nursing care. The analysis for quantitative studies often needs to evaluate the significant relationships between an intervention and an outcome, as well as identify any confounding or independent variables in the study (Moran, Burson, & Conrad, 2013). In this project, the percentage distribution and frequency of each group's satisfaction scale scores were recorded and compared.

The control group included 53 patients who underwent primary TKA within the testing period. Of the entire sample, 43% of the patients (n=23) met inclusion criteria and completed the satisfaction survey. As seen in Table 1, when reporting overall satisfaction postoperatively, 86.2% (n=19) of patients noted that they were "very satisfied," and 17.4% (n=4) of patients answered that they were "satisfied." With regards to pain relief, 78.2% of patients stated that they were "very satisfied," 13.1% stated they were "satisfied," and 8.7% of patients noted they were "dissatisfied." When patients reported their satisfaction with their ability to perform household activities, 73.9% of patients stated "very satisfied" and 26.1% stated that they were "satisfied." And finally, when expressing satisfaction with their ability to perform leisure or recreational activities, 69.6% of patients noted they were "very satisfied" while 30.4% of patients were "satisfied." The majority of all responses were "very

satisfied" or "satisfied", and no patients in the control group ever noted an answer of "very dissatisfied" regardless of the question. A total of 8 surveys were not included in statistical analysis because patients refused to or could not specifically answer all questions of the survey, failing to meet inclusion criteria.

Table 1; Control Group Results

CONTROL GROUP (23 of 53 responded)	Satisfaction with surgery in general	Satisfaction with surgery in regards to alleviating pain	Satisfaction with ability to do house/yard work	Satisfaction with ability to do recreational activity
Very Satisfied	19 (82.6%)	18 (78.2%)	17 (73.9%)	16 (69.6%)
Satisfied	4 (17.4%)	3 (13.1%)	6 (26.1%)	7 (30.4%)
Dissatisfied	0 (0%)	2 (8.7%)	0 (0%)	0 (0%)
Very Dissatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)

During the data collection period for the intervention group, 25 patients met inclusion criteria and underwent the educational session with the nurse practitioner. Patients then underwent their routine scheduled surgery. Between their 10-14 week postoperative period, 16 patients (64%) completed the satisfaction survey. As noted in Table 2, satisfaction levels for the intervention group revealed that 93.8% of patients were "very satisfied," and 6.2% of patients answered that they were "satisfied." When evaluating their pain relief, 81.25% of patients stated that they were "very satisfied," and 18.25% stated they were "satisfied." When scoring their ability to perform work or home-related activities, 75% of patients were "very satisfied" and 25% stated that they were "satisfied." And finally, when describing their ability to perform recreational or leisurely activities, 87.5% of patients noted they were "very satisfied" while 12.5% of patients were "satisfied."

Within the intervention group, there were no scores of "dissatisfied" or "very dissatisfied" reported. A total of two surveys were not included in statistical analysis because patients either refused to or could not specifically answer all questions of the survey, failing to meet inclusion criteria.

Table 2; Intervention Group Results

INTERVENTION GROUP (16 of 25 responded)	Satisfaction with surgery in general	Satisfaction with surgery in regards to alleviating pain	Satisfaction with ability to do house/yard work	Satisfaction with ability to do recreational activity
Very Satisfied	15 (93.8%)	13 (81.25%)	12 (75%)	14 (87.5%)
Satisfied	1 (6.2%)	3 (18.25%)	4 (25%)	2 (12.5%)
Dissatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Very Dissatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)

The percentage of satisfaction of this study's control mimics the data reported within the literature review. The control group stated an 82.6% satisfaction rate, while the literature review notes that general patient satisfaction levels range from 81-89 percent (Bourne et al., 2010, & Lau et al., 2012). Patients were generally more satisfied with their overall recovery and their pain control when compared to their performance of various activities.

Between both groups, the majority of patients noted some level of satisfaction within all categories. The intervention group consistently rated higher satisfaction percentages for each of the survey questions. Patients in the intervention group were most notably more satisfied than the control group with their ability to perform recreational activities (87.5% and 69.6%, respectively). In contrast, satisfaction levels for performing

household or work activities are nearly unchanged between the control and intervention groups (73.9% and 75%, respectively).

Project Success/Significance

General satisfaction scores reported by patients after undergoing primary TKA have consistently ranged from 81-89%, and are reflected within this study's control group scores. The research is thus found to be successful, as the percentage of very satisfied patients was higher with the implementation of nurse practitioner-driven education. Without any other identifiable influencing factors except their preoperative education, the intervention group's satisfaction increased to 93.8% as compared to the 82.6% satisfaction of the control group. Patients' most dramatic change in satisfaction was related to their ability to perform leisurely activities. It is unfounded to think that the intervention group was able to participate more fervently in recreational activities, and thus scored higher satisfaction. What is more likely is that the patients' preoperative expectations regarding their ability to perform recreation activities postoperatively were shaped and affected by their preoperative education. Based on this study's findings, one can assume that when patients are educated on appropriate postoperative expectations and are able to discuss their surgical concerns, patient postoperative satisfaction scores improves. Higher levels of satisfaction not only improve patient outcomes, but may also increase physician quality ratings, referrals, and the value of nurse practitioners in practice.

Project Limitations

The strength of the statistical analysis was limited in this study because the Likert scale utilized categorical data. Use of a Likert scale allows for statistical analysis that includes frequency and percentage calculations, but does not allow for analysis of the means. The use of t-testing was not relevant in this study, as the sample size was too small to determine if there was a truly normal distribution of data. Calculating means had no

value within this data, as there is not an in-between option for the satisfaction scale's categorical scoring.

A barrier of this study was the use of a convenience sample and the small sample size. Participants were limited to patients within a single surgeon's practice, creating a finite number of participants who could be utilized. Patients may also have had slanted satisfaction scores based on their relationship or feelings towards their total joint surgeon. A broader sample spanning several surgical practices would make satisfaction less contingent on the patient-surgeon relationship or personal satisfaction with the provider. The response rate of the participants ranged from 43-64 percent. While the researcher feels that this response rate is acceptable, there is certainly risk of bias in the analysis if the responder and non-responder satisfaction scores would be different. An additional recommendation might be to utilize mail-in surveys to increase return rates.

Summary

While surgical and instrumental advances are continuously developing for total knee arthroplasty, postoperative patient satisfaction has failed to improve beyond 81-89 percent. With the demand for TKAs expected to increase greater than 600%, nurse practitioners are in a key position to assist with the improvement of patient satisfaction through the use of preoperative education. Ultimately, the use of nurse practitioner-driven education for patients in the preoperative setting did show an increase in patient satisfaction scores. Though patient satisfaction after surgery does not always correlate with the satisfactory objective assessments of the surgeon, the use of the Mahomed scale is an effective tool for examining the multifaceted relationship between patients' pain, function, and expectations after a total knee arthroplasty.

Results of this research favor nurse practitioner-driven preoperative education for patients undergoing primary total knee arthroplasty. This could be incorporated into

clinical practice as an additional portion of an outpatient, preoperative visit. Given this study's results, it appears practical to incorporate this teaching into clinical practice as a new standard in patient care. The presence of a nurse practitioner in the outpatient setting to provide preoperative teaching and discussion has the ability to noticeably improve patient satisfaction postoperatively.

References

Agency for Healthcare Research and Quality (AHRQ). (2006). HCUP Facts and Figures, 2006: Statistics on Hospital-Based Care in the United States. Retrieved July 14, 2014 from: http://www.hcup-us.ahrq.gov/reports/factsandfigures/HAR_2006.pdf.

Baker, P.N., van der Meulen, J.H., Lewsey, J., & Gregg, P.J. (2007). The role of pain and function in determining patient satisfaction after total knee replacement. *The Journal of Bone and Joint Surgery, 89*(7): 893-900.

Bourne, R.B., Chesworth, B.M., Davis, A.M., & Mahomed, N.N. (2010). Patient satisfaction after total knee arthroplasty. *Clinical Orthopaedics and Related Research, 468*(1): 57-63.

Bullens, P.H., van Loon, C.J., Melefijt, M.C., Laan, R.F., & Veth, R.P. (2001). Patient satisfaction after total knee arthroplasty. *The Journal of Arthroplasty, 16*(6): 740-747.

Centers for Disease Control and Prevention (CDC). (2014). Osteoarthritis. Retrieved July 14, 2014 from: http://www.cdc.gov/arthritis/basics/osteoarthritis.htm.

Center for Orthopedic Research and Education (CORE). (n.d.). Total Knee Arthroplasty. Retrieved from http://www.thecoreinstitute.com/patient-and-visitor-information/core-patient-education/knee/total-knee-arthroplasty.html.

Clement, N.D. & Burnett, R. (2013). Patient satisfaction after total knee arthroplasty is affected by their general physical well-being. *Knee Surgery, Sports Traumatology, & Arthroscopy, 21:*2638-2646.

Clement, N.D., Jenkins, P.J., MacDonald, D., Nie, Y.X., Patton, J.T., Breusch, S.J., Howie, C.R, & Biant, L.C. (2013). Socioeconomic status affects the Oxford knee score and Short-Form 12 score following total knee replacement. *The Bone and Joint Journal, 95*(1): 52-58.

Clement, N.D., MacDonald, D., Simpson, A.H., & Burnett, R. (2013). Total knee replacement in patients with concomintant back pain results in a worse functional outcome and a lower rate of satisfaction. *The Bone and Joint Journal, 95*(12): 1632-1639.

Devers, B.N., Conditt, M.A., Jamieson, M.L., Driscoll, M.D., Noble, P.C., & Parsley, B.S. (2011). Does greater knee flexion increase patient function and satisfaction after total knee arthroplasty? *The Journal of Arthoplasty, 26*(2): 178-186.

Furlow, B. (2011). Nurse practitioners outscore physicians in patient satisfaction survey. *Clinical Advisor.* Retrieved from http://www.clinicaladvisor.com/nurse-practitioners-outscore-physicians-in-patient-satisfaction-survey/article/206090/.

Kwon, S.K., Kang, Y.G., Kim, S.J., Chang, C.B., Seong, S.C., & Kim, T.K. (2010). Correlations between commonly used clinical outcome scales and patient satisfaction after total knee arthroplasty. *The Journal of Arthroplasty, 25*(7): 1125-1130.

Lau, R.L., Gandhi, R., Mahomed, S., & Mahomed, N. (2012). Patient satisfaction after total knee and hip arthroplasty. *Clinical Geriatric Medicine, 28:* 349-365.

Lenz, E.R., Pugh, L.C., Milligan, R.A., Gift, A., & Suppe, F. (1997). The middle-range theory of unpleasant symptoms: An update. *Advanced Nursing Science, 19*(3): 14-27.

Mahomen, N., Gandhi, R., Daltroy, L, & Katz, J.N. (2011). The self-administered patient satisfaction scale for primary hip and knee arthroplasty. *Arthritis.* doi: 10.1155/2011/591253.

Moran, K., Burson, R., & Conrad, D. (2013). *The Doctor of Nursing Practice Scholarly Project: A Framework for Success.* Burlington, MA: Jones & Barlett Learning.

Myers, J.S. (2009). A comparison of the theory of unpleasant symptoms and the conceptual model of chemotherapy-related changes in cognitive function. *Oncology Nursing Forum, 36*(1): 1-10.

Narayan, K., Thomas, G., & Kumar, R. (2009). Is extreme flexion of the knee after total knee replacement a prerequisite for patient satisfaction? *International Orthopaedics, 33*: 671-674.

Nilsdotter, A.K., Toksvig-Larsen, S., & Roos, E.M. (2009). Knee arthroplasty: are patients' expectations fulfilled? A prospective study of pain and function in 102 patients with 5-year long follow-up. *Acta Orthopaedica, 80*(1): 55-61.

Peterson, L.E., Phillips, R.L., Puffer, J.C., Bazemore, A., & Petterson, S. (2013). Most family physicians work routinely with nurse practitioners, physician assistants, or certified nurse midwives. *Journal of the American Board of Family Medicine, 26*(3): 244-245.

Peterson, S.J., & Bredow, T.S. (2013). *Middle Range Theories.* Philadelphia: Lippincott Williams & Wilkins.

Rau, Jordan. (2013). Nearly 1,500 Hospitals Penalized Under Medicare Program Rating Quality. Retrieved July 14, 2014 from: http://www.kaiserhealthnews.org/stories/2013/november/14/value-based-purchasing-medicare.aspx.

Appendix

Patient Satisfaction Scale for Primary Hip and Knee Arthroplasty

1. **How satisfied are you with the results of your total knee replacement?**

   Very Satisfied
   Somewhat Satisfied
   Somewhat Dissatisfied
   Very Dissatisfied

2. **How satisfied are you with the results of your total knee replacement for improving your pain?**

   Very Satisfied
   Somewhat Satisfied
   Somewhat Dissatisfied
   Very Dissatisfied

3. **How satisfied are you with the results of your total knee replacement for improving your ability to perform home or yard work?**

   Very Satisfied
   Somewhat Satisfied
   Somewhat Dissatisfied
   Very Dissatisfied

4. **How satisfied are you with the results of your total knee replacement for improving your ability to perform recreational activities?**

   Very Satisfied
   Somewhat Satisfied
   Somewhat Dissatisfied
   Very Dissatisfied