

The Impact of Preoperative Education on Patients Undergoing Elective Total Hip and Knee Arthroplasty

The Relationship Between Patient Education and Psychosocial Factors

Julie L. Giardina ▼ Katrina Embrey ▼ Kathy Morris ▼ Helen M. Taggart

BACKGROUND: Preoperative education has been found to be responsible for patients having a realistic expectation of surgery as well as high level of satisfaction with their recovery. The Joint Academy offers preoperative educational classes for all patients undergoing elective knee and hip replacements.

PURPOSE: The purpose of this descriptive study was to determine whether the education provided by The Joint Academy has an impact on anxiety, expectation, and preparedness in patients who undergo elective total knee or hip arthroplasty.

METHODS: All patients who had total joint or hip arthroplasty over a 2-month period were invited to participate in this descriptive correlational study.

RESULTS: Of the 49 study participants, 28 attended The Joint Academy. Those who attended The Joint Academy were more likely to hold surgical expectations that better correlated with actual experience ($p = .425$). There was no statistically significant difference between the groups for nervousness ($p = .171$) or feeling prepared for the surgery ($p = .425$).

CONCLUSION: Offering education before knee or hip arthroplasty provides patients with an understanding of the expectations related to surgery.

With an estimated 7 million Americans living with prosthetic knees and hips, elective total knee and hip arthroplasty has become a popular surgery for aging adults (Maradit Kremers et al., 2015). According to the National Hospital Discharge Survey, approximately 693,000 and 310,000 Americans underwent elective total knee and hip replacement surgery in 2010, respectively (Williams, Wolford, & Bercovitz, 2015; Wolford, Palso, & Bercovitz, 2015). These figures are expected to increase in the future; CDC (2016) projects that by 2040, 78 million or 26% of the adult population will have doctor-diagnosed arthritis.

Total joint replacement is becoming more common in younger age groups as well as older age groups. By 2030, up to 62% and 52% of individuals undergoing total knee and hip replacements, respectively, will be younger than 65 years (Etkin & Springer, 2017). This increase in adults younger than 65 years choosing to undergo total joint arthroplasty is thought to be due to the increased diagnosis of osteoarthritis as well as improvements in surgical intervention, prosthesis technology, and postoperative recovery (Erens, Thornhill, Katz, Furst, & Curtis, 2015; Scott, 2015).

Despite the popularity of total joint replacement and the advances made in surgical procedures, patient expectations and satisfaction remain unmet for a significant number of individuals. Multicenter studies report that 20% of patients are not satisfied with the outcome of their total knee arthroplasty, with the unmatched expectations of postsurgery functionality between the patient and their surgeon being a major contributor to the dissatisfaction (Bourne, Chesworth, Davis, Mahomed, & Charron, 2010). In regard to satisfaction after total hip arthroplasty, a reported 7%–15% of patients are dissatisfied with the results of their surgery (Neuprez et al., 2016).

Preoperative education has been widely studied as an important factor in influencing patient expectations of

Julie L. Giardina, DNP, APRN, FNP-BC, Nurse Practitioner, Marathon Health, Statesboro, Georgia.

Katrina Embrey, DNS, RN, Assistant Professor, School of Nursing, Georgia Southern University, Savannah.

Kathy Morris, EdD, RN, Assistant Professor, School of Nursing, Georgia Southern University, Savannah.

Helen M. Taggart, PhD, RN, Professor, School of Nursing Georgia Southern University, Savannah.

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Correspondence: Helen M. Taggart, PhD, RN, Georgia Southern University, 11935 Abercorn St, Savannah, GA 31419 (htaggart@georgiasouthern.edu).

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surgery as well as postoperative recovery. It has been shown that preoperative education plays a significant role in reducing anxiety regarding surgery and recovery (Aydin et al., 2015; McDonald, Page, Beringer, Wasiak, & Sprowson, 2014; O'Connor et al., 2016; Tilbury et al., 2016). Preoperative information and education has also been found to provide patients with a more realistic expectation of surgery, which correlates to a higher level of satisfaction with surgical outcomes (Ghomrawi et al., 2011; McGregor et al., 2004; Okafor & Chen, 2019).

Patient education has been proven to have an effect on patient outcome in a variety of ways. From directly measured outcomes, such as joint functionality and pain control, to more qualitative data, such as the psychosocial factors influencing surgery, prior studies have identified the integral role preoperative education has on the patient (Aust et al., 2016; Aydin et al., 2015; Kearney, Jennrich, Lyons, Robinson, & Berger, 2011; Mancuso et al., 2008; O'Connor et al., 2016). The current study set forth to conduct a comprehensive review of literature focusing primarily on the relationship between preoperative education and psychosocial factors. Although multiple studies support the impact of preoperative education on anxiety reduction, there is conflicting evidence regarding the impact of such education on patient outcomes such as length of stay, pain control, and joint functionality (Aust et al., 2016; Aydin et al., 2015; McDonald et al., 2015; O'Connor et al., 2016). Preoperative education has also been found to provide patients with a greater feeling of preparedness for surgery (Ellrich & Yu, 2015).

The research regarding patient satisfaction and expectation reveals a disconnect between what the *patient* expects will result from undergoing total joint arthroplasty and what the *surgeon* realistically expects for the patient. It has been found that patient and surgeon opinions are not always aligned, and this misalignment may negatively influence patient satisfaction (Neuprezetal et al., 2016; Tilbury et al., 2016).

Statement of Problem

A 230-bed hospital in southeast Georgia, which houses the Advanced Institute for Joint and Spine Surgery, provides postoperative care following total knee and hip arthroplasty. The Advanced Institute for Joint and Spine Surgery offers a preoperation educational class (The Joint Academy) for all patients undergoing elective knee and hip replacements. Taught by an experienced and educated orthopaedic nurse, The Joint Academy offers a 1-hour classroom-style education session prior to

surgery. This class provides attendees with a general overview of total joint arthroplasty as well as specific information regarding the arthroplasty process at the hospital (see Table 1). In addition to verbal instruction, a printed guidebook outlining the important components of the postoperative period and what to expect in the days following surgery is also distributed. Despite the wealth of research regarding the link between preoperative education and patient outcomes, no research has been conducted to investigate the effect of The Joint Academy's education session on patient experience during the postoperative period at this institution.

Significance of the Study

According to the National Institute of Health Survey, 52.5 million adults reported having doctor-diagnosed osteoarthritis in a 2010–2012 survey (CDC, 2016). It is projected that by 2040 an estimated 78 million adults older than 18 years will have doctor-diagnosed arthritis (CDC, 2016). The lifetime risk of having symptomatic osteoarthritis in the knee is one in two whereas the lifetime risk for symptomatic hip osteoarthritis is one in four. Between the aging of the U.S. population and the effectiveness of total joint arthroplasty, it is predicted that the number of total joint replacement surgeries performed will continue to rise (Etkin & Springer, 2017). In light of the disconnect between procedural advances and sustained dissatisfaction among total joint replacement patients, it is necessary to continue research on bridging the gap between patient expectations and postsurgical experience.

Statement of Purpose

Through the use of an originally designed patient questionnaire, the aim of this descriptive study is to determine whether the education provided by The Joint Academy has an effect on patient anxiety, expectation, and preparedness in patients who undergo elective total knee and hip arthroplasty.

Research Questions

This research intended to answer the following questions: (a) do patients who attend The Joint Academy feel better prepared for surgery than those who do not attend, (b) does the preoperative education provided at The Joint Academy reduce the anxiety patients commonly experience about surgery and recovery, and (c) does the preoperative education provided at The Joint

TABLE 1. THE JOINT ACADEMY CURRICULUM

Preoperative	Surgery Day	Postoperative	Discharge
Presurgical screening	Equipment to be used: intravenous, urinary catheter, drain, cold packs	Pain control	Outpatient therapy
Blood thinner protocols		Physical therapy schedule	Surgeon follow-up visit
Presurgery nutrition needs	Anesthesia overview	Incentive spirometer use	Wound care instructions
Food and drink cessation protocol	Recovery room	Blood clot prevention strategies	Postsurgery nutrition needs
Presurgery exercises for blood clot prevention	Physical therapy protocol		
Surgical bath instructions	Pain control		
	Daily medication protocols		

Academy affect patient expectations of surgery and recovery?

Methodology

Aimed at investigating the role of preoperative education on psychosocial factors, the research utilized a correlational, descriptive study. By using a descriptive study design, the investigator was able to capture patient opinion and feelings related to total hip or knee arthroplasty in a single hospital setting.

SAMPLE POPULATION AND DESIGN

The sample population was a nonrandomized selection of patients undergoing elective total hip and knee replacement surgery from December 2016 to January 2017 at one southeast U.S. hospital. Of the 51 patients approached to participate in the study, 49 patients voluntarily participated. Inclusion criteria included adults undergoing elective total hip and knee arthroplasty. Exclusion criteria included incarcerated patients and patients undergoing total hip or knee revision surgery. This study was approved by the university and the hospital.

INSTRUMENTS AND TOOLS

The data collection tool was an originally designed questionnaire that was crafted by an expert panel of certified orthopaedic nurses and nursing faculty. Because prior research regarding preoperative education focused on factors such as length of stay, pain, and functional ability, the expert panel decided to create an original questionnaire to answer the research questions. Unlike other tools, this questionnaire focused exclusively on psychosocial influences by assessing feelings of nervousness and preparedness along with surgical expectations. The data collection tool included participant demographics, yes or no questions on the type of preoperative education received, a Likert scale to assess patient opinion, and two open-ended questions (see the Appendix).

DATA COLLECTION

The principal investigator invited patients to participate in the study on the morning of postoperative day 1 ensuring inclusion of all potential candidates, regardless of surgeon postsurgical protocols. The principal investigator distributed the questionnaire to patients who met inclusion criteria and agreed to participate. The questionnaires were completed in the participant's hospital room and the principal investigator collected them after the 5 minutes allotted for completion.

DATA ANALYSIS

The results from the questionnaire were compiled using a data spreadsheet and then entered into the Statistical Package for the Social Sciences (SPSS) for data analysis (IBM Corporation, 2015). The demographic data that were obtained and analyzed included age, gender, type of surgery, and total joint arthroplasty information

TABLE 2. DEMOGRAPHIC CHARACTERISTICS: AGE AND GENDER DISTRIBUTION OF ALL PARTICIPANTS

Participants, <i>n</i>	Age (Year), <i>M</i>	Range
Total: 49	70	43–88
Female: 28	69	43–88
Male: 21	71	55–88

sources. To test the main hypotheses and analyze the data between the two groups of participants, those who attended The Joint Academy and those who did not attend, the Mann–Whitney *U* test was used. The Mann–Whitney *U* test is a nonparametric test that compares the overall distribution of values between two independent groups (Grove et al., 2015).

Results

DEMOGRAPHICS

The demographics of the study participants by age and gender are displayed in Table 2. Of the 51 patients approached to participate in the study, 49 agreed to participation, signed the consent form, and completed the survey. The age of participants ranged from 43 to 88 years, with a mean age of 70 years. Of the 49 participants, 28 or 57% were female with the average age of the female participants being 69 years. The remaining 21 participants were male, representing 43% of the total population. The average age of male participants was 71 years.

Table 3 displays the demographic characteristics of the study participants who attended The Joint Academy by gender and type of total joint arthroplasty. A total of 28 (53%) participants attended The Joint Academy. The same percentage of females and males attended class (57%), with 16 of the 28 females and 12 of the 21 males attending class. A greater percentage of patients scheduled for total hip arthroplasty attended The Joint Academy than those scheduled for total knee arthroplasty, with 60% and 55% attendance rates, respectively.

Forty-seven percent ($n = 23$) of participants had a history of total hip or knee arthroplasty; 74% ($n = 17$) of prior surgeries performed at the same hospital and 47% ($n = 8$) attended the Joint Academy in the past. Prior total hip or knee replacements took place 2 months to 16 years earlier.

Data were also collected regarding the type of information participants received regarding total joint arthroplasty prior to surgery. Table 4 displays the type, total number, and percentage of each of the educational sources utilized by participants. Twelve of the 49 participants (24%) reported accessing no additional

TABLE 3. DEMOGRAPHIC CHARACTERISTICS: DISTRIBUTION OF PARTICIPANTS WHO ATTENDED THE JOINT ACADEMY

Gender	Female ($n = 16$) 57%	Male ($n = 12$) 57%
Type of surgery	Knee ($n = 22$) 55%	Hip ($n = 6$) 60%

TABLE 4. INFORMATION SOURCES REGARDING TOTAL JOINT ARTHROPLASTY OF ALL PARTICIPANTS

Information Source	Subjects, <i>n</i>	%
None	12	24.4
Friends and family	5	13.5
Physician	12	32.4
Internet search	2	5.4
Physician and friends/family	13	35.1
Internet and friends/family	3	8.1
Physician, internet, and friends/family	2	5.4

outside information or education. However, 75% of those 12 participants attended The Joint Academy. Information obtained from friends or family was characterized as anecdotal in nature under the assumption that at least some of that information included personal stories about prior total joint arthroplasty experience. Information obtained from the physician was defined as any information the patient received from the surgeon or other healthcare staff at any time during the total joint arthroplasty process, from initial consultation to time of surgery. Nearly 73% of the participants received information from the surgeon, with the largest percentage of participants reporting a combination of physician and friends and family education sources (35.1%). A comparatively low percentage of participants reported using the internet to search for information regarding their upcoming surgery (18.9%).

HYPOTHESES TESTING

Hypothesis 1

It was hypothesized that there would be a difference in the level of *nervousness* or *anxiety* between the participants who attended The Joint Academy and those who did not. As with level of preparedness, level of nervousness was recorded on a scale that spanned from “not at all” nervous as the lowest score to “extremely” at the highest score. It was hypothesized that participants who attended the educational class would be more likely to score a lower level of nervousness. As displayed in Table 5, the null hypothesis was retained as the difference in nervousness among the two groups was not statistically significant at $p = .171$. Statistical significance was defined as a p value $< .05$.

TABLE 5. MANN–WHITNEY *U* TEST

Null Hypothesis	Test	Significance	Decision
The distribution of NERVOUS is the same across categories of ATTEND CLASS	Independent-samples Mann–Whitney <i>U</i> test	.171	Retain the null hypothesis
The distribution of PREPARED is the same across categories of ATTEND CLASS	Independent-samples Mann–Whitney <i>U</i> test	.425	Retain the null hypothesis
The distribution of EXPECTATION is the same across categories of ATTEND CLASS	Independent-samples Mann–Whitney <i>U</i> test	.046	Reject the null hypothesis

Note. Asymptotic differences are displayed. The significance level is .05.

Hypothesis 2

It was hypothesized that there would be a difference in reported level of *preparedness* between participants who attended The Joint Academy and those who did not. This hypothesized difference in preparedness would be evident from a Likert scale ranking closer to “extremely prepared.” As displayed in Table 5, the null hypothesis was retained as the difference in preparedness among the two groups was not statistically significant at .425. Statistical significance was defined as a p value $< .05$.

Hypothesis 3

Finally, it was hypothesized that there would be a difference in *expectations* between participants who attended The Joint Academy and those who did not. Participants were asked about expectations prior to surgery and whether their actual experience correlated with expectations. Once again, a Likert scale was used for participants to rate their responses. It was hypothesized that those participants who attended the educational class would score higher on expectation matching experience than those who did not attend the class. As displayed in Table 5, the null hypothesis was rejected as the difference in experience expectation among the two groups was statistically significant at $p = .46$. Statistical significance was defined as a p value $< .05$.

Open-Ended Questions

Participants were given the opportunity to answer two open-ended questions at the conclusion of the questionnaire, “What helped the most getting you ready for surgery?” and “Is there any information missing from The Joint Academy?” These questions provided participants with an opportunity to add valuable information to guide future preoperative curriculum. Two central themes emerged from these questions. Participants felt that attending The Joint Academy was most helpful in preparing both themselves and their spouses and was crucial in helping spouses develop their supportive role. As stated by one participant, “My wife got just as much out of the class as I did, she felt like she knew what to do while she was here with me.” The other theme that emerged from these questions was the need to provide separate classes for total hip and knee arthroplasty. Participants felt that separate classes would allow the instructor to focus on joint-specific information and answer specific questions better.

Discussion

Despite prior research linking preoperative education to reduced anxiety and a greater feeling of preparedness prior to total joint arthroplasty, the current study failed to find statistical significance. McDonald et al. (2014), O'Connor et al. (2016), and Kearney et al. (2011) all found a correlation between preoperative education and reduction in patient anxiety or feeling more prepared for surgery. Of the participants who did not attend The Joint Academy, all but 3 accessed some source of information about total joint arthroplasty prior to surgery; obtaining general information about total joint arthroplasty from any source may have reduced anxiety and increased preparedness in those participants who did not attend The Joint Academy. Supporting this theory are results from prior studies on preoperative anxiety that determined the majority of participants believed information would help in coping with anxiety (Aust et al., 2016; Aydin et al., 2015; O'Connor et al., 2016). In addition to the effect general information has on level of anxiety, 47% of study participants had a history of knee or hip arthroplasty. A history of arthroplasty for almost the majority of the sample size is theorized as the rationale for lack of statistically significant difference in anxiety and feeling of preparedness.

Although the majority of prior research regarding patient expectation focuses on long-term expectations of joint functioning after arthroplasty, the current study took a novel approach and investigated how preoperative education influenced immediate expectations of the surgical experience and postoperative process. While including general information about total joint arthroplasty, the majority of the education provided in the class and in printed material distributed during class focused on the presurgical interventions and the postoperative hospital stay. The current study found a statistically significant difference in expectations between the participants who attended The Joint Academy and those who did not. It is hypothesized the difference between the two groups is explained by attendance at The Joint Academy.

With 93.8% of study participants reporting information from some source, we analyzed the types and frequency of the additional sources utilized. As previously mentioned, the most popular source of information was the surgeon, with 72.9% of study participants obtaining information from the surgeon alone or in combination with other sources. However, only 5.4% of patients cited the internet as an information source. This may be explained by the average age of the participants (70 years old), an age group that may turn to more traditional sources of information.

LIMITATIONS

Authors recognize several limitations. Participants were recruited from one hospital in the southeast and may not be representative of the general population. As the study was the principal investigator's graduate thesis, time for data collection was limited, resulting in a small sample size. The small sample size may not be representative of all individuals who have received total knee or hip arthroplasty at this hospital. The use of an

investigator-developed tool instead of a validated tool also limits the study. Eight different surgeons, from three orthopaedic institutions, performed the arthroplasties. We did not follow up participants prior to surgery and have no information regarding the type or extent of information provided by the surgeon or the orthopaedic institution. Participants were surveyed on postoperative day 1, so findings do not represent patient opinions at any other point in their surgery experience. It is of note that among the eight orthopaedic surgeons and three orthopaedic institutions, one orthopaedic institution had zero attendance at The Joint Academy. The lack of attendance from those participants may have influenced findings.

IMPLICATIONS

Nurses have a powerful role in patient care and patient education. The time nurses spend with patients affords opportunity to provide one-on-one patient-centered education. This research provides additional validation for the contribution of patient education on patient outcomes, including patient confidence and competence in self-care. Patient education—whether on disease process, diagnostic testing, or surgical procedure—has the potential to directly influence positive patient outcomes. This research also provides confirmation for healthcare institutions that preoperative education has the potential to positively influence patient experience and satisfaction, which may result in higher patient satisfaction survey scores.

RECOMMENDATIONS

The current research investigated sources of health-related information used by patients scheduled for elective total knee and hip arthroplasty as well as the impact of the education session provided by The Joint Academy. For future research, we recommend surveying patients before and after attending the class with a more specific list of questions to assess the quality of The Joint Academy's curriculum and the direct impact attendance had on the individual's prior knowledge. We also recommend investigating the effect of preoperative education on long-term outcomes, such as joint functionality and quality of life, six and 12 months after arthroplasty. Using a mail survey 4–6 weeks after arthroplasty to investigate whether preoperative education influenced the individual's overall satisfaction with the surgical experience at the hospital would also be recommended.

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APPENDIX

The Joint Academy: Patient Survey

Surgery Date _____ **Age** _____ **Gender** _____ **Postoperative Day** _____ **Circle: Knee/Hip**

Did you attend The Joint Academy prior to this surgery	Yes	No
Have you had prior joint replacement surgery?	Yes	No
Was your prior surgery at St. Joseph's/Candler?	Yes	No
How long since your prior joint replacement surgery?		
Did you receive any other additional joint replacement information from outside sources?	Yes	No
If yes, what other sources of joint replacement information did you receive?		
Internet search friends/family physician's office		

Using the scale provided, please rate how you feel about your joint replacement surgery thus far:

	Not at all		Somewhat		Extremely
How nervous were you prior to your total joint replacement?	1	2	3	4	5
Did you feel adequately prepared for your surgery?	1	2	3	4	5
Was attending The Joint Academy useful in preparing you for surgery?	1	2	3	4	5
Did attending The Joint Academy change your expectation of surgery?	1	2	3	4	5
Has your experience with your surgery been what you expected?	1	2	3	4	5
What helped the most getting you ready for surgery?					
Is there any information missing from The Joint Academy?					