Randomized Trials to Modify Patients' Preoperative Expectations of Hip and Knee Arthroplasties

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Abstract Patients have multiple expectations of THA and TKA. We asked whether preoperative educational classes addressing recovery during the first year could modify patients' expectations of their 12-month postoperative recovery. Participants were enrolled consecutively in two randomized, controlled trials, one for THA (177 patients) and one for TKA (143 patients). Control patients preoperatively received a standard THA or TKA class addressing recovery immediately after surgery. Intervention patients preoperatively received the standard class plus a joint-specific module addressing recovery during the first

12 months. Before and after the class, patients completed either a hip-specific or knee-specific validated expectations survey. The main outcome was the within-patient change in expectation scores (maximum increase, +100; maximum decrease, -100) before and after the class but preoperatively. Mean changes in hip scores were $+3.3 \pm 8$ for intervention patients (range, -22–+32) and $+4.9 \pm 8$ for control patients (range, -13–+29). Mean changes in knee scores were -3.4 ± 10 for intervention patients (range, -26–+33) and $+2.4 \pm 10$ for control patients (range, -30–+30). Patients' preoperative expectations of their recovery from THA or TKA can be modified by preoperative educational classes.

Level of Evidence: Level I, therapeutic study. See the Guidelines for Authors for a complete description of levels of evidence.

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Each author certifies that his or her institution has approved the human protocol for this investigation, that all investigations were conducted in conformity with ethical principles of research, and that informed consent was obtained.

The Corresponding Author confirms all seven authors were required to design this trial.

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Introduction

Patients undergoing THA and TKA seek these elective procedures because they have multiple expectations of symptom relief, improvement in physical function, and improvement in psychosocial well-being [5, 8, 12, 14, 15, 17–19, 25, 29]. Expectations of THA and TKA have been described and measured with qualitative techniques, such as focus group discussions and individual interviews [3, 15, 17, 19, 20]. These studies confirm patients have questions about immediate perioperative issues, and the recuperation process and long-term function [3, 20]. In addition, some studies have generated structured surveys showing validity and test-retest reliability based on patient and expert panel review [15, 17–19]. These surveys have been used to rate the importance of expectations and associations between expectations and function.

Patients' expectations of arthroplasty most likely derive from many sources, including patient and clinical characteristics, influences from a patient's social network, interactions with health professionals, and information patients acquire from their own research [5, 9, 21, 23, 28]. Because appropriate expectations should be based on what is potentially achievable, orthopaedic surgeons should guide expectations through discussions with individual patients so surgeons and patients agree on the goals of surgery. However, it is important to acknowledge patients often seek arthroplasty because they already have certain expectations, and for some patients, these expectations are not modifiable [8]. For other patients undergoing arthroplasty, however, expectations are modified through contact with surgeons, other health professionals, and other patients during the preoperative and perioperative process [8].

Patients preparing for elective surgery and hospitalization increasingly are being offered educational materials and classes to explain anticipated care [3, 20, 21]. Although primarily focusing on the process of care, preoperative education also offers the opportunity to address realistic expectations of outcome [9, 20]. Fostering realistic expectations is particularly important for arthroplasty because fulfilled expectations have been linked to adherence with postoperative recommendations and satisfaction with the outcome of surgery [5–7, 9, 10, 13, 17, 21, 23, 25].

We hypothesized joint-specific educational modules addressing recovery during 12 months (intervention) would be more effective in changing patients' expectations of THA and TKA than the standard classes addressing only perioperative recovery (control). We also questioned whether more intervention patients had expectations after the class that coincided with surgeons' recommended expectations and whether change in expectation scores correlated with patient- and surgeon-reported preoperative status.

Materials and Methods

We conducted two randomized, controlled trials to modify the expectations of surgery for patients undergoing THA or TKA as measured by the Hospital for Special Surgery Total Hip Replacement Expectations Survey[®] (THR Survey) [17, 18] and the Hospital for Special Surgery Total Knee Replacement Expectations Survey[®] (TKR Survey) [19]. Patients undergoing primary THA (or TKA) between November 2001 and September 2003 were eligible if their surgeons were participating in this study, if they were English-speaking, and if they were scheduled to attend a preoperative THA class (or TKA class) at the hospital at a time when one of the nurse investigators was teaching. Patients were excluded if their surgery was cancelled

before the class or if they were missed because of changes in scheduling. Control patients received the standard class and intervention patients received the standard class plus additional information (ie, module) focusing on expectations of recovery during the first 12 months after surgery. Expectations for recovery at 12 months were measured before the class and again after the class (but before surgery) during telephone interviews with patients, and within-patient change in expectation scores was the primary outcome. In addition, patients' expectations were compared with surgeons' recommended expectations of THA and TKA and with patients' symptoms and preoperative function.

One hundred seventy-eight consecutive patients undergoing THA were randomized (Fig. 1). Ninety-one patients attended an intervention class; of these, 90 completed the followup and one was not contacted in time before surgery to complete the followup. Eighty-seven patients attended a control class and all completed the preoperative followup. Both groups were similar with respect to demographic and clinical characteristics (Table 1), except more patients ($p = 0.007$) in the control group (98%) had unilateral THA compared with the intervention group (87%). There were no differences in expectations between patients having unilateral or bilateral surgery based on THR Survey scores. Four surgeons participated in the THA trial. No serious adverse events occurred during the study period.

One hundred forty-six consecutive patients undergoing TKA were randomized (Fig. 2). Seventy-one patients attended an intervention class; of these, 70 completed the preoperative followup and one was not contacted in time before surgery. Seventy-five patients attended a control class; 73 completed the followup and two were not

Fig. 1 A flow diagram shows the patients in the THA trial.

Table 1. Patient and clinical characteristics

Characteristic	THA (n = 177)			TKA (n = 143)		
	Intervention (n = 90)	Control (n = 87)	p Value	Intervention (n = 70)	Control (n = 73)	p Value
Age (years)*	71 ± 6	70 ± 6	0.22	72 ± 8	71 ± 8	0.60
Women	59%	53%	0.42	50%	64%	0.08
White	98%	99%	1.00	97%	96%	0.68
College graduate	59%	56%	0.68	56%	51%	0.55
Currently married	66%	68%	0.87	67%	63%	0.61
Retired	54%	69%	0.05	57%	63%	0.48
Had as much help at home as desired	68%	62%	0.43	54%	55%	1.00
Osteoarthritis	96%	93%	0.48	96%	92%	0.33
Unilateral surgery	87%	98%	0.007	73%	74%	0.88
Duration of symptoms (months)*	42 ± 41	39 ± 39	0.72	89 ± 100	84 ± 70	0.34
Had prior lower extremity orthopaedic surgery	26%	26%	1.00	64%	64%	0.93
No major comorbidity [†]	64%	72%	0.26	61%	63%	0.85
Body mass index (kg/m ²)*	28 ± 6	28 ± 5	0.66	31 ± 7	30 ± 6	0.43
WOMAC** [‡]						
Pain	51 ± 17	49 ± 20	0.20	45 ± 19	48 ± 21	0.40
Stiffness	54 ± 18	51 ± 19	0.40	50 ± 19	55 ± 19	0.20
Function	57 ± 16	55 ± 18	0.30	52 ± 16	54 ± 19	0.60
SF-36** [‡]						
Physical function	17 ± 20	20 ± 22	0.40	18 ± 18	17 ± 20	0.60
Pain	39 ± 15	43 ± 19	0.20	43 ± 16	40 ± 19	0.20

* Values expressed as mean ± standard deviation; [†]corresponding to a Charlson Comorbidity Index score of 0; [‡]possible score range 0–100, higher score = better condition.

Fig. 2 A flow diagram shows the patients in the TKA trial.

contacted in time before surgery. Both groups were similar with respect to demographic and clinical characteristics (Table 1). Five surgeons participated in the TKA trial. No serious adverse events occurred during the study period.

Sample size for each trial was determined for the primary outcome. The primary outcome of the THA trial was the within-patient change in the total THR Survey score, specifically the followup score minus the baseline score. The primary outcome of the TKA trial was the within-patient change in the total TKR Survey score. For both trials, surgeons rated a change in the same direction for five expectations as an important clinical change. This corresponded to a change of 6 points in transformed score. For both trials, alpha was set at 0.05 and beta at 0.80. For the THA trial, the standard deviation used was 9.8, which was obtained during the original test-retest reliability of the scale [17, 18], yielding a sample size of 42 patients per group, or 84 total. Given we had little experience with attrition for a trial such as this that required three contacts with patients during a relatively short time, we planned a priori to overenroll patients undergoing THA. For the TKA trial, the standard deviation used was 12.0, similarly obtained during the original test-retest reliability of the scale [19], yielding a sample size of 64 patients per group, or 128 total. Given the THA trial was completed first and followup targets were met, we overenrolled fewer patients in the TKA trial.

Several days before the THA class, we (SG, JG) contacted patients by telephone and interviewed them during

that telephone contact. This interview constituted the baseline THA assessment. We (SG, JG) developed an interview script to standardize the description of the study, the sequence of questions, and the explanation of response options for the THR Survey. The THR Survey is a patient-derived scale composed of 18 items addressing symptoms, daily function, exercise, employment, and psychologic well-being [17, 18]. The survey was developed from interviews with 180 patients and validated by an expert panel of orthopaedic surgeons and another 60 patients who also participated in test-retest reliability measurements. Patients were asked to indicate which of the possible expectations they had and the importance of each expectation, with response options ranging from very important to not important [18]. For the current trial, we used a different response format: specifically, we asked patients how much improvement they expected for each item. Response options were “complete improvement or back to normal” (4), “a lot of improvement” (3), “a moderate amount of improvement” (2), “a little improvement” (1), or “this expectation does not apply to me/I do not have this expectation” (0). This modified format was tested in another group of 50 consecutive patients scheduled for THA who were recruited from the offices of five orthopaedic surgeons. Cronbach alpha was 0.77 and test-retest reliability was reconfirmed by comparing responses obtained during two interviews conducted approximately 4 days apart. Responses for each item in the modified version can be summed to generate a total raw score that ranges from 0 to 72 or a transformed score [$= (\text{raw score}/72) \times 100$], which ranges from 0 to 100. Higher scores indicate expecting more improvement for more items. During the telephone interview for the current trial, patients were asked whether they had each of the 18 expectations and, for each expectation they had, how much improvement they expected at 12 months with options (as stated previously) ranging from 4 to 0. Patients undergoing THA in the intervention and control groups were similar with respect to baseline expectation scores, 87 ± 13 and 85 ± 12 , respectively (Table 2). These scores indicated patients in both groups came to the class with high expectations for recovery at 12 months.

Similarly, several days before the TKA class, we (SG, JG) contacted patients by telephone and interviewed them during that telephone contact using the standardized script and the TKR Survey. This interview constituted the baseline TKA assessment. The TKR Survey also is a patient-derived scale addressing symptoms, walking distance, daily function, employment, and psychologic well-being [19]. The TKR Survey has 17 items when walking items are considered collectively and 19 items when considered separately. The survey was developed from interviews with 161 patients and validated by an expert panel of orthopaedic surgeons and another 62 patients who also participated in test-retest reliability measurements. The TKR Survey also originally was formatted to rate importance of expectations; patients are asked to indicate which of the possible expectations they have and the importance of each expectation, ranging from very important to not important [19]. For this trial, the response format also was modified to range from “complete improvement” (4) to “this expectation does not apply to me/I do not have this expectation” (0) and was tested in another group of 38 consecutive patients scheduled for TKA who were recruited from the offices of seven orthopaedic surgeons. Cronbach alpha was 0.79 and test-retest reliability was reconfirmed by comparing responses obtained during two interviews conducted approximately 4 days apart. The total summed raw score ranges from 0 to 76 and the transformed score [$= (\text{raw score}/76) \times 100$] ranges from 0 to 100. Higher scores indicate expecting more improvement for more items. During the telephone interview for the current trial, patients were asked whether they had each of the 19 expectations and, for each expectation they had, how much improvement they expected at 12 months with options (as stated previously) ranging from 4 to 0. For the TKA trial, patients in the intervention and control groups also were similar with respect to baseline expectation scores, 85 ± 14 and 85 ± 13 , respectively (Table 2).

As part of the development of the educational modules (described subsequently), surgeons completed the THR Survey and the TKR Survey from the point of view of patients undergoing general arthroplasty from an older age

Table 2. Comparison of baseline, followup, and within-patient change in expectations survey scores

Parameter	Survey scores for patients undergoing THA* (n = 177)			Survey scores for patients undergoing TKA† (n = 143)		
	Intervention (n = 90)	Control (n = 87)	p Value	Intervention (n = 70)	Control (n = 73)	p Value
Baseline (before class)	87 ± 13	85 ± 12	0.23	85 ± 14	85 ± 13	0.75
Followup (after class)	91 ± 10	90 ± 11	0.42	81 ± 11	88 ± 10	0.0003
Within-patient change	3.3 ± 8	4.9 ± 8	0.18	-3.4 ± 10	2.4 ± 10	0.0008

Values expressed as mean $\pm$ standard deviation; *Hospital for Special Surgery Total Hip Replacement Expectations Survey® [17, 18], transformed score range 0–100, higher score = greater expectations; †Hospital for Special Surgery Total Knee Replacement Expectations Survey® [19], transformed score range 0–100, higher score = greater expectations.

group. Their responses corresponded to a score of 90 for the THR Survey and 78 for the TKR Survey. Forty-nine percent of patients undergoing THA and 17% of patients undergoing TKA in the current trials had scores that were within 6 points of these values. The percentages were similar for intervention and control patients in each trial.

During the baseline telephone interview, patients also completed the lower extremity WOMAC composed of three domains (pain, stiffness, function) and the SF-36 General Health Survey composed of eight physical and mental health domains [1, 27]. For the WOMAC and the SF-36, possible scores for each domain range from 0 (worst condition) to 100 (best condition). Both scales are valid for telephone interview [2, 22].

Several days after completing the baseline assessment, patients came to the hospital for their preoperative class. Patients undergoing THA attended either the standard THA class (control group) or the standard THA class plus an additional module addressing longer-term THA recovery (intervention group). Patients undergoing TKA attended either the standard TKA class (control group) or the standard TKA class plus an additional module addressing longer-term TKA recovery (intervention group).

The standard THA and TKA classes were first developed in 1994 as part of the Multidisciplinary Preoperative Arthroplasty Education Program at the Hospital for Special Surgery. The goal of the program was to provide patients and families with information about the immediate perioperative period. Developed collaboratively by nurses, arthroplasty surgeons, therapists, and social workers, each 90-minute joint-specific class addresses the admissions process, postoperative recovery, pain management, and rehabilitation. Classes are taught by nurse educators approximately 7 days before surgery in a designated classroom, which resembles an orthopaedic hospital room. Nurses present information didactically and through demonstrations, and patients and their families are encouraged to ask questions and actively participate. In 2002, 1613 primary THAs and 1390 primary TKAs were performed and greater than 95% of patients attended the classes.

In response to many patients' requests for information about longer-term recovery, we decided the classes should be broadened to formally address recovery from discharge to 12 months. Therefore, longer-term recovery modules for each joint were developed with the intention of adding them to the standard classes. The modules were developed collaboratively by nurse educators and arthroplasty surgeons as follows. Three surgeons (PMP, EAS, TPS) independently considered possible expectations of THA and TKA using the expectation surveys as templates. Then, they rated the likelihood of achieving each expectation for different age groups with particular consideration for older patients. Next, consensus among the surgeons was obtained

regarding how much improvement patients, in general, should anticipate for each expectation. Then, the nurse educators (SG, LMB) and surgeons agreed on the content of the modules. This also was informed by the nurses' experiences with concerns that patients had raised during prior classes. Next, the nurses formatted the modules so they would fit seamlessly into the existing standard classes. The final modules address symptoms (eg, pain, limping), function (eg, walking, exercising, conducting daily activities), and psychosocial issues (eg, psychologic well-being, interactions with others). Each module takes 15 minutes to teach and describes what most patients can expect during the first 12 months after THA or TKA. Like the standard classes, the modules inform patients recovery varies from patient to patient, expectations described in the modules are for the general population of patients undergoing arthroplasty, and individual patients should discuss their projected recovery with their surgeon.

The standard classes and those with the additional modules were taught by three nurse educators (SG, LMB, LL) who were experienced in teaching arthroplasty classes. The nurses were either involved in developing the modules or were trained through apprenticeship. Descriptions of the content, format, and material to be addressed during the modules also were added as supplemental material to the classes' instructors' manuals. To ensure fidelity of the intervention, nurses often cotaught classes or were present when classes were being taught by the other nurses.

Followup occurred before surgery when patients were contacted by telephone for a second time and asked again to complete the expectation survey. Their responses to the second administration of the survey should reflect any new information they assimilated from the class. For the THA trial, the mean time between the baseline assessment and the class was 5 ± 4 days and the mean time between the class and the followup assessment was 4 ± 4 days. For the TKA trial, the mean time between the baseline assessment and the class was 6 ± 7 days and the mean time between the class and the followup assessment was 5 ± 5 days.

Medical records also were reviewed for diagnosis, orthopaedic surgeons' assessments, and perioperative course. Comorbidity was measured according to the Charlson Comorbidity Index, a widely used scale for which scores are reported from 0 (no major comorbidity) to 4 or greater (multiple comorbidity) [4].

We randomized each trial separately in permuted blocks using randomization tables and ensured concealment with numbered envelopes. Study participants were assigned to classes that were taught by nurses who were trained specifically in administration of the new modules and the standard classes. At the start of each class, the nurse opened the next envelope to determine the randomization group; thus, the unit of randomization was the class.

Randomization was verified at the conclusion of each trial by comparing dates of classes, patient assignments, and the randomization protocol.

The baseline assessment was performed before randomization and therefore was blind. The nurses who taught the classes were blind to the baseline assessment. The nurses who conducted the followup assessments were blind to the baseline assessment and the randomization group. Patients were blind to the randomization group.

Data from each trial were analyzed separately. To determine the degree to which randomization was successful, we compared baseline characteristics between groups using *t* tests and chi square tests and Mann-Whitney tests for nonparametric comparisons. The main outcome, within-patient change in expectation scores, was calculated as the followup score minus the baseline score and could range from -100 (the maximum decrease in expectations) to 100 (the maximum increase in expectations). Within-patient change in scores was compared between groups with *t* tests. A mixed-effects model then was fitted by including the class as a random factor nested in randomization group. The difference in expectation scores was the dependent variable and baseline score was a covariate. In addition, to account for clustering of some patients in the same class (ie, 118 patients undergoing THA and 86 patients undergoing TKA were in classes with other trial enrollees), we calculated results for various scenarios, such as where there was only one enrollee in a class, where we randomly selected one enrollee from classes with more than one enrollee, and where we conducted a random-effects model with all enrollees. In other analyses, patients' expectations before and after the class were compared with expectations recommended by the surgeons during development of the modules. Finally, other analyses included measuring possible associations between the change in THR Survey and TKR Survey scores (dependent variables) and age, gender, preclass expectations, randomization group, surgeon-reported preoperative status, and patient-reported preoperative pain and function measured by the WOMAC and the SF-36 (independent variables). Changes in THR Survey or TKR Survey scores were assessed in bivariate analysis with each independent variable. All variables with *p* values of 0.05 or less were entered and retained in multivariable regression models and the variance explained by each model was calculated. Data analyses were done using SAS (SAS Institute Inc, Cary, NC) [26].

Results

For the THA trial, the intervention group did not have greater change in preoperative expectation scores compared

with the control group. Specifically, the mean within-patient change in THR Survey scores was similar ($p = 0.18$) for the intervention and control groups (mean, 3.3 ± 8 [range, -22 to 32] versus mean, 4.9 ± 8 [range, -13 to 29]). This result was confirmed when analyzed with a mixed-effects model with the class as a random effect within randomization group (p for the intervention = 0.5) and when clustering was accounted for by comparing patients' responses according to number of participants in a class. For both groups, mean followup THR Survey scores after the class were higher compared with the baseline scores, 91 ± 10 for the intervention group ($p = 0.0002$) and 90 ± 11 for the control group ($p < 0.0001$). Forty-three percent of patients undergoing THA (43% of intervention and 42% of control patients) had a change in score of 5.5 or more.

For the TKA trial, the intervention group did have greater change in preoperative expectation scores compared with the control group. Specifically, the mean within-patient change in scores was lower ($p = 0.008$) for the intervention than the control group (mean, -3.4 ± 10 [range, -26 to 33] versus mean, 2.4 ± 10 [range, -30 to 30]). This result was confirmed when analyzed with a mixed-effects model with the class as a random effect within randomization group (p for the intervention = 0.0001) and when clustering was accounted for by comparing patients' responses according to number of participants in a class. For the intervention group, the mean followup TKR Survey score after the class (81 ± 11) was lower ($p = 0.008$) compared with the baseline score. However, the mean followup TKR Survey score after the class (88 ± 10) was higher ($p = 0.04$) for control patients. Thus, intervention patients had fewer expectations after the class compared with control patients who had more expectations. Forty-five percent of patients undergoing TKA (56% of intervention and 34% of control patients) had a change in score of 5.5 or more.

More patients (53%) had THR Survey scores that coincided with surgeons' scores after the class; this rate was 54% for intervention and 51% for control patients. More patients (31%) also had TKR Survey scores that coincided with surgeons' scores after the class and this rate was higher ($p = 0.01$) for intervention (43%) than control patients (21%).

For the THA trial, worse ($p = 0.006$) SF-36 pain and having more ($p < 0.0001$) expectations at baseline were associated with decreased expectations in multivariable analysis controlling for randomization group ($R^2 = 0.37$). For the TKA trial, older ($p = 0.0004$) age, having more ($p = 0.01$) severe disease rated by surgeons, having worse ($p = 0.03$) SF-36 physical function, and having more ($p < 0.0001$) expectations at baseline were associated with decreased expectations in multivariable analysis controlling for randomization group ($R^2 = 0.53$).

Discussion

The questions addressed in these randomized trials were whether educational interventions could change patients' preoperative expectations of THA and TKA, whether changed expectations more closely coincided with surgeons' recommended expectations, and what clinical characteristics were associated with change in expectations.

Our trials have certain limitations and strengths. First, the trials were limited in that they were conducted in one urban orthopaedic referral center and may not be generalizable to patients in other settings. Another limitation is aspects of the intervention were discussed during some of the control classes. This occurred when control patients asked specific questions about longer-term recovery. Another limitation was that randomization was by class, not by patient, because randomization by patient would have required teaching patients individually, which is not our usual practice. However, random effects modeling with class nested within randomization group gave results that agreed with analyses that did not account for clustering. The major strength of these studies was they were randomized, controlled trials addressing several research questions. Another strength was developing the educational interventions with the collaboration of several high-volume arthroplasty surgeons and nurse educators with extensive experience teaching patients undergoing arthroplasty. Finally, we had high followup rates and surveys tested for various psychometric properties.

One of the most striking findings in both trials was the influence of the standard class. Several factors may have contributed to this. First, based on the nurses' prior experiences, it was anticipated some patients would ask about longer-term recovery. Before the trials started, we decided that if control patients asked about longer-term recovery, the existing practice would be maintained and their specific questions would be answered. Thus, some control patients received some information that intervention patients received. Second, the socially supportive group dynamic of the class probably increased patients' confidence and expectations about recovery. Obviously, the group dynamic also affected the intervention patients, but given baseline expectation scores were already high, this cointervention may have made it more difficult for the surveys to discern a larger difference between groups. The impact of the control state also has clinical implications because it shows, after consulting with their surgeons, patients are influenced by other patients and staff as they proceed through the routine preoperative process.

Another important finding was expectation scores were high at baseline in both trials. This finding supports the position that patients elect to undergo these procedures because they believe their situation will markedly improve

in various ways [8, 9, 12]. In both trials, many patients at followup had expectations that coincided with surgeons' general recommendations and it was reassuring to find this proportion was greater in the intervention groups. Compared with the findings of other researchers, we identified only one recent study in which surgeons anticipated better results than patients undergoing arthroplasty [24], whereas most studies reported patients having higher expectations than generally would be recommended [9, 14, 20].

Why did the intervention result in greater change in patients undergoing TKA than in patients undergoing THA? There are several possibilities. First, control patients having THA asked about long-term recovery more often than control patients having TKA; thus, control patients having THA received elements of the intervention more often than control patients having TKA. This would have led to smaller differences between THA intervention and control groups and, by comparison, larger differences between TKA intervention and control groups. Another possible reason for the difference is patients undergoing TKA had symptoms longer and more of them had prior joint surgery. Therefore, patients undergoing TKA probably had discussed their condition with more healthcare providers and thus were accustomed to hearing more points of view. In addition, given recovery from TKA is more variable than recovery from THA, the TKA module conveyed to patients a wider range of typical 12-month conditions. Some patients undergoing TKA may not have been aware of this variability before the class and therefore were more likely to change their expectations.

Why were the patients undergoing TKA more likely to change in the direction of fewer expectations? There are several possibilities for this. First, given the greater rehabilitation challenges generally associated with TKA, the TKA module informed patients the majority would have a moderate amount to a lot of improvement for most symptoms and functions, whereas the THA module informed patients the majority would have a lot to complete improvement. Thus, the more moderate projected recovery conveyed in the TKA module probably led to decreased expectations. Another possibility relates to functional status. For both trials, worse physical function was associated with a decrease in expectations. This effect was more marked in the TKA trial because, compared with patients undergoing THA, patients undergoing TKA had worse function measured by the SF-36 and the WOMAC.

We found more baseline expectations, worse pain and function, and older age (for the TKA group) associated with greater change in expectations. Some studies have reported differences in preoperatively cited and postoperatively recalled THA symptoms and expectations [11, 16]. Relationships between expectations and patient characteristics from several cross-sectional studies are inconclusive.

For example, two studies reported patients undergoing THA with worse function had higher expectations [12, 18], whereas another study found no correlation between function and expectations of THA and TKA [14].

Our trials show expectations of patients undergoing THA and patients undergoing TKA can be modified by classes administered before surgery. An educational module focusing on 12-month recovery decreased expectations in patients undergoing TKA and resulted in more patients having expectations that coincided with surgeons' recommendations.

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