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Preoperative Education for Total Knee Replacement

A National Survey of Orthopaedic Nurses

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BACKGROUND: Preoperative education aids in reducing the incidence of poor outcomes after total knee replacement (TKR) and increasing patient readiness for discharge home but is not well described in the literature.

PURPOSE: The purpose of the study is to describe the current design of preoperative education for TKR across the United States.

METHODS: A large, national sample of orthopaedic nurses completed an online survey to describe preoperative education at their facilities.

RESULTS: Most participants provided preoperative education as part of interprofessional teams in either a group format or combined group and individual education. Verbal instruction was the most common educational delivery method, followed by written instruction. Education typically lasted between 1 and 1.5 hours, was delivered in a single session, and included a variety of topics.

CONCLUSION: Results of this study describe preoperative educational practices and can support future research to improve patient outcomes following TKR surgery.

Background

It has been projected that approximately 1,375,574 annual total knee replacements (TKRs) will be conducted this year (2020) (American Academy of Orthopedic Surgeons, 2014; Kurtz, Ong, Lau, & Bozic, 2014). The majority of patients report being satisfied with the outcomes of their TKR surgery (Bourne, Chesworth, Davis, Mahomed, & Charron, 2010; Choi & Ra, 2016; Kahlenberg et al., 2018). Following TKR surgery, patients typically acquire functional knee range of motion and report increased quality of life and improved performance in daily life activities (Shan, Shan, Suzuki, Nouh, & Saxena, 2015). However, a portion of the population does not achieve optimal outcomes in the postsurgical phase and may experience falls, reduced function, and readmission to hospital. As many as 11.8% of patients fall in the months after undergoing TKR surgery (Swinkels, Newman, & Allain, 2009). Hospital readmission following TKR surgery has been reported to occur in 5%–8% of this population (Belmont et al., 2016; Schairer, Vail, & Bozic, 2014; Welsh et al., 2017). Falls and readmission are concerning because they may increase patient risk for hospital-acquired infections and lead to further functional declines. Preoperative education may be a mechanism for reducing the incidence of poor outcomes after TKR as well as increasing readiness for discharge home.

Although preoperative education programs for patients scheduled for TKR surgery are relatively common, outcomes vary and aspects of program design have not been fully described in the literature as a standard of care. Researchers have found that education prior to TKR surgery reduced falls while inhospital (Clarke, Timm, Goldberg, & Hattrup, 2012), decreased anxiety (Spalding, 2003), increased preparation for surgery (Kearney, Jennrich, Lyons, Robinson, & Berger, 2011), improved pain control (Chen, Chen, & Lin, 2014), and also reduced length of stay (Jones, Alnaib, Wilkinson, St Clair Gibson, & Kader, 2011), among other positive outcomes. However, larger systematic reviews found no difference between patients who attended preoperative education and those who did not, or only minor differences such as small variations in anxiety levels (Louw, Diender, Butler, & Puentedura, 2013; McDonald, Hetrick, & Green, 2004; McDonald, Page, Beringer, Wasiak, & Sprowson, 2014).

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Components of preoperative education for TKR such as length, timing, content, or healthcare provider vary considerably across settings. Length of education has been reported to vary from 12 minutes to half a day (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). In some programs, patients participated in one session or completed the education independently, whereas others received multiple preoperative education sessions (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). Educational delivery methods vary from receiving only video or booklet materials to receiving in-person, multimodal education. Providers of the education are often interprofessional and can include disciplines such as nursing, physical therapy, occupational therapy, case management, and dietetics (Louw et al., 2013). Nurses and physical therapists were the most frequent providers reported in the literature (Louw et al., 2013; McDonald et al., 2014). The composition of the preoperative education team may impact the structure of the education program, such as content covered during education sessions. Evidence supporting education prior to TKR is variable and there is not currently a standardized protocol for best practice.

A thorough description of preoperative education is needed to illustrate current national practice trends. This description can also serve as a basis for future research that may examine the effectiveness of educational programs to support improved patient outcomes. Therefore, the purpose of this research study is to describe the current design of preoperative education for TKR across the United States.

Methods

Research Design

This study utilized an online survey to describe the current structure of preoperative education in the United States. A second portion of the study used a qualitative transcendental phenomenological approach to describe orthopaedic nurses' perceptions of preoperative education prior to TKR surgery. Only the results from the quantitative survey portion are presented in this article. The study was approved by a university institutional review board through expedited review in the fall of 2017. This research was financially supported by a university-funded scholarship grant and was conducted in partial fulfillment of a doctoral program.

Recruitment

Participants were orthopaedic nurses whose position called for them to provide education for patients prior to TKR surgery. Potential participants were members of the National Association of Orthopaedic Nurses (NAON). A comprehensive list of all members of NAON was condensed by excluding individuals who were retired, identified pediatrics (rather than adults) as their practice area, or reported practicing outside of the United States; this process left a total of 3,955 members. National Association of Orthopaedic Nurses compiled and maintained the final list allowing participants to remain anonymous to the researchers. Potential participants were contacted directly via e-mail by the NAON office. The recruitment e-mail included a description of the study, contact information for the primary researcher, information regarding informed consent, and a link to complete the survey. Text instruction at the beginning of the online survey stated that completion of the survey was considered as providing informed consent. Participants were advised that participation was voluntary and could be stopped at any time.

Data Collection

Survey questions were uploaded to the Research Electronic Data Capture (REDCap), which is a secure system that supports web-based data collection for research studies that is accessed through a university affiliation (Harris et al., 2009). The primary investigator sent the e-mail recruitment letter and link to the survey to the NAON office, and the organization distributed these to the individuals on the e-mail list for the study.

Data Collection Instrument

The survey was developed by the primary researcher on the basis of a thorough review of the literature and review of three preoperative education programs at hospitals local to the researcher. Literature and program review was used to identify common content, design, and delivery methods for preoperative education to guide question and answer options on the survey. The survey was also piloted with seven healthcare providers including two nurses, one physical therapist, and four occupational therapists (Causey-Upton, Howell, Kitzman, Custer, & Dressler, 2018). The pilot survey included 16 questions related to demographic information, current program design, perceptions regarding ideal program design, and feedback on the design of the survey itself. Revisions were made to the survey on the basis of participant feedback and responses on the pilot survey including adding more answer options for some questions, adding additional questions, and providing clarification for one survey item. The final survey consisted of 24 items and included questions regarding demographics, current design of preoperative education, and perceptions regarding ideal program design for preoperative education (see Appendix). Twenty-three items were provided in a closed-ended, multiple choice format and 1 question was open-ended. Questions regarding the current program design described the existing structure of preoperative education at participants' facilities, whereas items related to ideal program design asked participants what changes they would make, if any, to create the ideal program.

Data Analysis

Quantitative data were analyzed using SPSS (Version 24; IBM Corp, Armonk, New York) and the "Data Exports, Reports, and Stats" feature from REDCap (Vanderbilt University, Nashville, Tennessee). Descriptive statistics were used for data analysis to determine frequency and percentages for any closed-ended responses on the survey, whereas open-ended survey responses (such as "other" answer options) were collated from all participants.

Results

Survey Findings

The following sections present survey response rate, a description of respondents, and prevalent responses on survey items. Responses are reported by content area from the survey.

Response Rate

Of 3,955 individuals contacted for participation in this survey, 600 responded by opening the survey, completing a portion of the survey, or completing the entire survey. One person entered and submitted the survey but did not complete any question items, so they were not included in the sample size for calculating response percentages. Eight individuals were excluded from further participation on the survey after the first question item where they indicated that they were not currently practicing as a nurse within the United States. This resulted in 591 participants who completed additional survey questions for a 15% response rate. Reports for survey response rates vary in the literature, but a recent 2016 study examining multiple modes of survey delivery found an overall response rate of 27.9% with general web-based survey response rates at 17.1% (Guo, Kopec, Cibere, Li, & Goldsmith, 2016), and the response rate of this study falls within this range. Survey respondents are described in the following section.

Participant Demographics

The vast majority of participants had been working in the nursing field for more than 10 years (n = 488; 82.6%) and most respondents had obtained a bachelor's degree as their highest level of education (n = 276; 46.7%; see Table 1). Participants represented 44 states of primary regions of practice for the 586 nurses who completed this question item, and there were no respondents who indicated the following as their primary state of practice: Vermont, Montana, Nevada, North Dakota, Oklahoma, and West Virginia.

Table 1. Respondent Demographics

	Respondent Frequency	Respondent Percent
Nursing experience		
>10 years	488	82.6
>5 to 10 years	65	11
>2 to 5 years	35	5.9
1 to 2 years	3	0.5
<1 year	0	0
Education		
Doctorate	6	1
Master's	200	33.8
Bachelor's	276	46.7
Associate's	91	15.4
Other	16	2.7

Note. N = 591 eligible to respond, n = 589 completed the survey items. Percentages calculated from overall N = 591.

Table 2. Preoperative Education Experience

Experience	Respondent Frequency	Respondent Percent
>10 years	169	36.0
>5 to 10 years	115	24.5
>2 to 5 years	105	22.4
1 to 2 years	57	12.2
<1 year	23	4.9

Note. N = 469 eligible to respond, n = 469 completed the survey item. Percentages calculated from overall N= 469.

Preoperative Education

Of the 591 participants, 469 (79.4%) currently provided preoperative education for TKR. Most respondents had been involved in preoperative education with this population for more than 10 years (n = 169; 36.0%; see Table 2). Answering yes to providing preoperative education before TKR permitted participants to complete the remainder of the survey, as this was the intended sample. The remaining percentages of responses on survey items are calculated out of 469 participants to reflect the number of respondents who continued survey participation, even if some individuals skipped an individual survey item, to more accurately reflect the proportion of characteristics among providers and their facilities. This provision will also prevent the results from overestimating the prevalence of responses among the participants who completed the remainder of the survey. The structure of preoperative education at participants' facilities is described in the sections that follow.

Current Program Design

Healthcare Providers

There were 396 (84.4%) participants who provided preoperative education as part of an interprofessional team with at least one other provider involved in addition to nursing. Nursing department was the most common provider involved in preoperative education (n = 450; 95.9%; see Table 3). Sixty participants (12.8%) responded "other" to this question item and identified several additional providers such as pharmacist, anesthetist, and physician assistant. Because only 450 out of 469 participants responded that nursing was involved in preoperative education, it is possible that some participants identified only providers besides themselves, rather than including all members of the preoperative education team. In addition, this may have accounted for some providers whose program was delivered only online and not in-person.

Preoperative Education Program Structure

Preoperative education was most commonly provided in a group format (n = 236; 50.3%), followed by combined group/individual education (n = 187; 39.9%). Providing education in individual format (n = 42; 9.0%) and online format only (n = 3; 0.6%) was less common. One individual skipped this question item. Participants most frequently reported educating patients with planned TKR

Table 3. Healthcare Providers Currently Involved in Preoperative Education

Healthcare Providers	Respondent Frequency	Respondent Percent
Nursing	450	95.9
Physical therapy	387	82.5
Occupational therapy	200	42.6
Case management	192	40.9
Social work	99	21.1
Home healthcare	75	16.0
Other	60	12.8
Pain management	55	11.7
Dietetics	34	7.2
Hospital concierge	10	2.1

Note. $N = 469$ eligible to respond, $n = 467$ completed the survey item. Percentages calculated from overall $N = 469$.

together with other surgical patients ($n = 287$; 61.2%), whereas others educated TKR patients alone ($n = 147$; 31.3%). For others, this question did not apply because they provided only individual education ($n = 24$; 5.1%) or educated patients only online ($n = 4$; 0.9%). Seven participants did not complete this question item. When patients with planned TKR were educated with patients who had other planned surgeries, total hip replacement was the most common ($n = 283$; 98.6% for those who educated patients with multiple diagnoses together, 60.3% of all TKR education participants), followed by total shoulder replacement ($n = 61$; 21.3% of those who educated patients with multiple diagnoses together, 13.0% of all TKR education participants), rotator cuff repair ($n = 8$; 2.8% of those who educated patients with multiple diagnoses together, 1.7% of all TKR education participants), and back surgery ($n = 15$; 5.2% of those who educated patients with multiple diagnoses together, 3.2% of all TKR education participants).

Educational Topics

How to prepare for surgery was most frequently included as an educational topic for preoperative education ($n = 466$; 99.4%), followed by the recovery process ($n = 460$; 98.1%) and what to expect while in the hospital ($n = 458$; 97.7%). See Table 4 for frequency of participants' responses for all content areas.

Educational Delivery Methods

There were 461 (98.3%) participants who used multiple modes of educational delivery, consisting of two or more delivery approaches. Participants identified that verbal instruction was the most common method for delivering preoperative education ($n = 453$; 96.6%), followed by written instruction ($n = 420$; 89.6%). See Table 5 for frequency of responses for all delivery methods.

Timing of Preoperative Education

There were 431 (91.9%) orthopaedic nurses who provided preoperative education within 4 weeks prior to

Table 4. Educational Topics Currently Included in Preoperative Education

Educational Topic	Respondent Frequency	Respondent Percent
How to prepare for surgery	466	99.4
The recovery process	460	98.1
What to expect while in the hospital	458	97.7
Managing pain	452	96.4
Exercise before and/or after surgery	423	90.2
Home safety	418	89.1
Adaptive equipment	388	82.7
Self-care (such as dressing, bathing, toileting) for the postoperative phase	375	80.0
Precautions	370	78.9
Home modifications	367	78.3
Functional mobility (such as transfers)	355	75.7
Expected functional outcomes	312	66.5
Weight-bearing status	312	66.5
Nutrition (such as increased protein and fiber intake)	302	64.4
Details of the surgical procedure	266	56.7
Edema management	264	56.3
Instrumental activities of daily living (such as completing laundry and caring for the home) for the postoperative phase	245	52.3
When to resume normal activities at home	237	50.5
Anatomy of the knee joint	230	49.0
Caregiver training	226	48.2
Information about the continuous passive movement machine	115	24.5
Other	52	11.1

Note. $N = 469$ eligible to respond, $n = 468$ completed the survey item. Percentages calculated from overall $N = 469$.

scheduled TKR. The majority of respondents provided preoperative education 2 weeks before the planned surgery ($n = 209$; 44.6%). Sessions scheduled closer or farther in advance of the surgery date were less common (see Table 6). Sixteen participants (3.4%) indicated that they were unsure how long before the planned TKR surgery the patients attend the course.

For most education programs, patients attended one preoperative education session total ($n = 407$; 86.8.%). Some participants reported having patients attend two preoperative education sessions ($n = 25$; 5.3%), one participant (0.2%) reported that patients attended three or four sessions before surgery, and a few ($n = 10$; 2.1%) reported having patients attend five or more education sessions prior to surgery. Four (0.9%) participants responded not applicable to indicate that education was

Table 5. Current Preoperative Educational Delivery Methods

Educational Delivery Method	Respondent Frequency	Respondent Percent
Verbal	453	96.6
Written	420	89.6
PowerPoint	346	73.4
Demonstration	270	57.6
Workbook	197	42.0
Video	127	27.1
Client demonstration	121	25.8
Online	118	25.2
Other	6	1.3

Note. $N = 469$ eligible to respond, $n = 467$ completed the survey item. Percentages calculated from overall $N = 469$.

provided online instead of in-person. Twenty-one participants did not complete this question item. There were 372 (79.3%) participants who reported providing preoperative education sessions lasting one or more hours. Most participants reported that preoperative education sessions at their facility lasted 1 hour to less than 1.5 hours ($n = 168$; 35.8%). See Table 7 for frequency of responses for length of education sessions.

Perceived Ideal Program Design

Healthcare Providers

There were 260 (55.4%) participants who identified at least one additional provider they wanted to add to the preoperative education team. Respondents most commonly identified that they would like to add case management as an additional provider to their current preoperative education team ($n = 138$; 29.4%), followed by pain management ($n = 105$; 22.4%). A few participants ($n = 19$; 4.1%) responded "other" to this question item, identifying providers such as anesthetist, pharmacist, and diabetes educator. Although many professionals were identified as important to add to the current preoperative education team, 157 (33.5%) respondents felt that they did not need to add any additional providers. See Table 8 for response frequency.

Table 6. Weeks Education Currently Provided Before Surgery

Weeks Education Provided Before Surgery	Respondent Frequency	Respondent Percent
<1 week	5	1.1
1 week	46	9.8
2 weeks	209	44.6
3 weeks	102	21.7
4 weeks	74	15.8
5 weeks	3	0.6
6 weeks	8	1.7
7 weeks	0	0
≥8 weeks	3	0.6

Note. $N = 469$ eligible to respond, $n = 466$ completed the survey item. Percentages calculated from overall $N = 469$.

Table 7. Length of Current Preoperative Education

Length of Preoperative Education	Respondent Frequency	Respondent Percent
<15 minutes	3	0.6
15–29 minutes	6	1.3
30–59 minutes	46	9.8
1 to <1.5 hours	168	35.8
1.5 to <2 hours	121	25.8
2 to <2.5 hours	62	13.2
2.5 to <3 hours	18	3.8
>3 hours	3	0.6

Note. $N = 469$ eligible to respond, $n = 427$ completed the survey item. Percentages calculated from overall $N = 469$.

Educational Topics

When asked what additional topics were not currently included in their preoperative education program that would be valuable for patients prior to TKR, nutrition was the most commonly desired topic to add ($n = 95$; 20.3%), followed by caregiver training ($n = 68$; 14.5%). More than half of participants felt that there were topics that would be beneficial to add to their current preoperative education program but 199 (42.4%) did not identify any topics to add to their program. Some additional content areas reported by participants for the "other" response option included anesthesia, addressing difficulty with sleep, mental health issues, and driving after surgery. See Table 9 for response frequency.

Educational Delivery Methods

Respondents most frequently wanted to add online education as an additional delivery method for their preoperative

Table 8. Providers to Add to Preoperative Education

Healthcare Providers	Respondent Frequency	Respondent Percent
None	157	33.4
Case management	138	29.4
Pain management	105	22.4
Home healthcare	77	16.4
Social work	74	15.8
Dietetics	73	15.6
Physical therapy	67	14.3
Occupational therapy	61	13.0
Other	19	4.1
Hospital concierge	15	3.2

Note. $N = 469$ eligible to respond, $n = 459$ completed the survey item. Percentages calculated from overall $N = 469$.

Table 9. Educational Topics to Add to Preoperative Education

Educational Topic	Respondent Frequency	Respondent Percent
None	199	42.4
Nutrition (such as increased protein and fiber intake)	95	20.3
Caregiver training	68	14.5
Edema management	58	12.4
Instrumental activities of daily living (such as completing laundry and caring for the home) for the postoperative phase	53	11.3
Expected functional outcomes	52	11.1
When to resume normal activities at home	43	9.2
Anatomy of the knee joint	38	8.1
Self-care (such as dressing, bathing, toileting) for the postoperative phase	35	7.5
Details of the surgical procedure	30	6.4
Functional mobility (such as transfers)	27	5.8
Weight-bearing status	26	5.5
Exercise before and/or after surgery	25	5.3
Home modifications	24	5.1
Home safety	21	4.5
Adaptive equipment	20	4.3
The recovery process	17	3.6
Managing pain	16	3.4
Other	12	2.6
How to prepare for surgery	10	2.1
What to expect while in the hospital	9	1.9
Precautions	8	1.7

Note. $N = 469$ eligible to respond, $n = 434$ completed the survey item. Percentages calculated from overall $N = 469$.

class ($n = 222$; 47.3%). Video ($n = 137$; 29.2%) and client demonstration or the teach back method ($n = 104$; 22.2%) was also commonly identified. The following other methods were also reported by respondents to add to their current program design: workbook ($n = 48$; 10.2%), healthcare provider demonstration ($n = 22$; 4.7%), verbal instruction ($n = 12$; 2.6%), and written instruction ($n = 11$; 2.3%). The majority of participants ($n = 349$; 74.4%) wanted to add at least one additional delivery method to their current program. Seventeen participants did not complete this question item.

Preoperative Education Program Structure

Participants were almost evenly split regarding their preference for educating patients with planned TKR separately from other diagnoses ($n = 233$; 49.7.%), or together with patients who were scheduled to have other surgeries such as total hip replacement ($n = 222$; 47.3%). Fourteen participants did not complete this question item. The majority of participants preferred educating patients with planned TKR in either group format ($n = 178$; 38.0%) or in a combination of group and individual education ($n = 253$; 53.9%), which was most commonly reported. Thirty (6.4%) participants preferred individual only and six (1.3%) participants felt that online education was the ideal design for preoperative education. Two individuals did not complete this question item.

Table 10. Ideal Time Frame to Provide Education Before Surgery

Weeks to Provide Education Before Surgery	Respondent Frequency	Respondent Percent
<1 week	4	0.9
1 week	41	8.7
2 weeks	192	40.9
3 weeks	89	19.0
4 weeks	113	24.1
5 weeks	0	0
6 weeks	19	4.1
7 weeks	0	0
≥8 weeks	6	1.3

Note. $N = 469$ eligible to respond, $n = 464$ completed the survey item. Percentages calculated from overall $N = 469$.

Timing of Preoperative Education

Participants most commonly identified that having patients attend preoperative education 2 weeks before surgery was ideal ($n = 192$; 40.9%), followed by 4 weeks ($n = 113$; 24.1%). See Table 10 for frequency of responses.

The majority of participants felt that attending one session before surgery was ideal ($n = 372$; 79.3%), followed by attending two sessions ($n = 82$; 17.5%) or three sessions ($n = 6$; 1.3%). No respondents selected four sessions, but one (0.2%) individual recommended five or more preoperative sessions and another recommended that participants have only online sessions and no in-person education. Seven individuals did not complete this question item.

Most participants indicated that having education sessions last between 1 hour and less than 1.5 hours was ideal ($n = 189$; 40.3%), followed by 1.5 hours to less than 2 hours ($n = 121$; 25.8%). See Table 11 for response frequency regarding ideal program length.

Discussion

This study sought to provide a detailed description of preoperative education prior to TKR surgery in the United States. Results demonstrated that preoperative education varied across facilities, although some aspects of program design were common among settings. Practices identified in this study and a review of the literature, led to the development of recommendations for the structure of preoperative education and are presented in the sections that follow.

Table 11. Ideal Length of Preoperative Education

Ideal Length of Preoperative Education	Respondent Frequency	Respondent Percent
<15 minutes	3	0.6
15–29 minutes	9	1.9%
30–59 minutes	84	17.9
1 to <1.5 hours	189	40.3
1.5 to <2 hours	121	25.8
2 to <2.5 hours	41	8.7
2.5 to <3 hours	11	2.3
>3 hours	1	0.2

Note. $N = 469$ eligible to respond, $n = 459$ completed the survey item. Percentages calculated from overall $N = 469$.

Interprofessional Practice and Preoperative Education

The majority of participants reported providing preoperative education as part of an interprofessional team. Nursing was the most frequently reported provider, followed by physical therapy and occupational therapy. Previous literature has found nursing and physical therapy to be most often involved in preoperative education before TKR; however, occupational therapy has not been reported as one of the more common preoperative education providers for this population, which contradicts findings from this study (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). More than half of the participants reported that they wanted to add at least one additional provider to the preoperative education team, indicating that interprofessional practice was valued by respondents.

Interprofessional practice has been associated with many positive benefits such as improving patient outcomes, reducing length of stay, and decreasing readmissions (White et al., 2013; World Health Organization, 2010). It is recommended that multiple disciplines participate in providing education before surgery, with essential members including nursing, physical therapy, and occupational therapy, among other providers. A common role for nursing includes coordinating care with a wide variety of disciplines (American Nursing Association, 2017), and this positions the profession to be a lead provider of preoperative education. Nurses are essential for organizing and guiding preoperative education and should be supported with the participation of other healthcare providers. For facilities where it is not possible for some providers to participate in-person, it is recommended that providers use other methods to participate such as assisting with developing written materials for the education program, creating videos that can be shown in class regarding important areas of disciplinary instruction, providing patients an avenue to ask questions for specific providers outside the class, and contributing in other ways such as assisting with developing online education materials.

Preoperative Education Program Format

Group education was the most common educational format in this study, followed by a combination of group and individual education. Previous research has reported that education sessions were more evenly divided between programs that provided individual education or group education, rather than a combination of both approaches (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). In addition, more than half of participants in this study reported educating patients with TKR together with patients with other diagnoses. Research is needed to determine the optimal format of preoperative education, such as group or combination approaches, in relation to patient outcomes after surgery. Education may be best provided in a combination of group and individual format when possible to allow participants to benefit from both program designs (Edwards, Mears, & Barnes, 2017). It is also recommended that patients either be educated separately from other patient diagnoses before surgery, or that combined education classes be mainly limited to only including those who are scheduled for total hip replacement, as surgical recommendations and precautions to support the postsurgical phase can vary significantly for other surgeries.

Educational Topics

Previous research has reported the following common topics being addressed in preoperative education for TKR, which aligns with a higher frequency of reported inclusion in this study: preparing for surgery, the recovery process, what to expect while in the hospital and after surgery, self-care, functional mobility, adaptive equipment, managing pain, safety at home, exercise, and precautions (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). Although these topics are often addressed in preoperative education, previous research has shown that patients do not have accurate expectations regarding some of these areas, such as pain levels after surgery and expected functional performance (Goldsmith et al., 2017; Westby & Backman, 2010). Patients may need additional instruction regarding difficult content areas to be better prepared for surgery and the recovery phase.

Providers reported important topics that were currently included in education as well as content areas that should be added to their current program design. These responses provide a beginning foundation for recommended content areas to include in education before surgery; however, education must also be individualized per patient. Shared content areas could be covered in group education whereas information for specific patients could be provided during an individual portion. Other options include adding a decision tree to online components of education where patients are asked to respond to questions about their circumstances that would lead them to specific educational information. Workbooks provided to patients before surgery could follow a similar format, with patients being guided toward certain sections of the workbook based on their personalized needs. Further research is needed to determine the best topics that should be included in preoperative education as a baseline to support readiness to

return home after surgery, as well as how to accurately relay expectations regarding difficult concepts such as pain intensity and short length of stay with expected discharge to home.

Educational Delivery Methods

Most participants in this study reported using multiple instructional methods to deliver preoperative education at their facilities. Verbal instruction was most common, followed by the use of written educational materials, which aligns with previous research (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). Patients have previously reported verbal education, followed by video, as their main preferred educational delivery format (Chetty & Ehlers, 2009). Some studies have examined the combination of video and verbal education but did not find improved outcomes compared with verbal instruction alone (Rastogi, Davis, & Chesworth, 2007; Leal-Blanquet et al., 2013). Although the evidence varies, offering multiple methods of educational delivery, such as online education, may address the needs of individuals who have different preferred learning styles or those who may be unable to attend preoperative education due to pragmatic barriers such as geographic distance or work schedules. The best combination of methods for providing preoperative education prior to TKR has not been determined in the literature and should be examined in future research.

Timing of Preoperative Education

The majority of participants reported providing preoperative education within 4 weeks of the scheduled surgery, similar to previous systematic reviews that have documented the timing of preoperative education for included studies (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). In this study, 2 or 3 weeks was most commonly reported, but the range of time frames varied from less than 1 week in advance of surgery to 8 weeks or more. However, most participants reported on the survey that 2 weeks prior to surgery was ideal, followed by 3 weeks. Based on these responses, it is recommended that education be provided between 2 and 3 weeks before surgery and no more than 1–4 weeks in advance of the scheduled procedure. The 2- to 3-week time frame would allow enough time for patients to implement suggestions, begin achieving strength gains from exercise, and purchase needed adaptive equipment but may not be so far in advance that patients would be likely to forget important information. The length of time before surgery that education should be provided has not been examined previously and presents an area for future research to determine the best time frame for this education.

Most preoperative education sessions were provided in a single visit and lasted between 1 and 2 hours. Descriptions of program length reported in the literature have varied from 12 minutes to half a day (Louw et al., 2013; McDonald et al., 2004; McDonald et al., 2014). Most participants reported through survey responses that education sessions should last 1 hour or more but that longer sessions were not ideal. It is recommended that education sessions last between 1 and 1.5 hours to allow enough time to cover important content and provide patients opportunities to ask questions, as well as to avoid overwhelming patients or causing discomfort due to stiffness from osteoarthritis that could limit learning. Education may also be best provided in a single session or a maximum of two sessions along with providing additional resources for patients to continue learning outside the course, in order to limit the burden of travel for patients. The length and number of optimal sessions for education prior to TKR surgery should be examined to determine guidelines for best practice.

Limitations

Because the survey link was universal (to maintain anonymity), it was possible that participants could have forwarded the survey to another provider outside the nursing field, although not initially targeted for the sample. Participants were advised not to forward the survey link to others in the recruitment e-mail to allow the researchers to determine an accurate response rate for the survey. It is also possible that some participants may have taken the survey more than once because multiple e-mails were sent to increase response rate; however, instructions stated that the survey should be completed only once. Participants from 44 states completed the survey, but preoperative education programs in the remaining six states could differ from the study sample. All geographic regions of the United States were included in this research, limiting the impact of missing locations. Finally, recommendations from this study were developed from data regarding the current design of preoperative education; this does not indicate best practice or efficacy of the program design and is an area for future research.

Summary

This study was needed to provide a thorough description of preoperative education programs across the United States. A total of 599 participants completed a portion of the survey, with 469 participants providing detailed information about the program at their facility as providers of preoperative education for TKR. Previous descriptions of preoperative education programs in the literature are limited and present variable program designs. This large, national survey was needed to fully describe the content, providers, and delivery methods of preoperative education for TKR patients across the United States with a representative sample. Results of the quantitative portion of this study could inform future research to examine the effectiveness of various program designs in order to develop programs that will support better postoperative outcomes. Patient and provider perceptions of the adequacy of preoperative education for various diagnoses should also be explored to guide changes to program design to better meet patient needs.

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Appendix

A Survey of the Content, Providers, and Delivery Methods of Preoperative Education for Persons Undergoing Total Knee Replacement

Thank you for your participation. Completion of this survey will be considered as providing informed consent to participate in this research.

Demographics:

1. Are you currently practicing as a nurse within the United States?
- ☐ Yes
- ☐ No (end survey participation)

2. How long have you been working in the nursing field?
- ☐ Less than 1 year
- ☐ 1–2 years
- ☐ More than 2 years to 5 years
- ☐ More than 5 years to 10 years
- ☐ More than 10 years

3. What is the highest level of education that you have completed?
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Clinical doctorate
- ☐ Research doctorate
- ☐ Other (please list)

4. In what state do you primarily practice as a nurse? *Drop down box of all 50 states

5. Do you currently provide preoperative education prior to total knee replacement surgery?
- ☐ Yes
- ☐ No (end survey participation)

6. For what other conditions besides total knee replacement do you currently provide preoperative education?
- ☐ Total hip replacement
- ☐ Total shoulder replacement
- ☐ Rotator cuff repair
- ☐ Back surgery
- ☐ None
- ☐ Other (please list)

7. How long have you been involved in providing preoperative education for patients with planned total knee replacement?
- ☐ Less than 1 year
- ☐ 1–2 years
- ☐ More than 2 years to 5 years
- ☐ More than 5 years to 10 years
- ☐ More than 10 years

Current design of preoperative education at your facility:

8. What disciplines or providers are involved in the preoperative education program at your facility for total knee replacement, *including yourself*?
- ☐ Nursing
- ☐ Physical therapy
- ☐ Occupational therapy
- ☐ Social work
- ☐ Case management
- ☐ Dietetics
- ☐ Pain management
- ☐ Home healthcare
- ☐ Hospital concierge
- ☐ Other (Please list):

9. In what format is preoperative education typically provided at your facility for total knee replacement?
- ☐ Individual
- ☐ Group
- ☐ Both group and individual
- ☐ Not applicable (if education does not occur in-person)

10. Are patients with planned total knee replacement educated separately from other orthopaedic diagnoses in the preoperative education class?
- ☐ Yes
- ☐ No (automatic skip to 10B)
- ☐ Not applicable because education is provided to individual patients rather than in a group

10B. What other orthopaedic diagnoses are included in the preoperative education class?
- ☐ Total hip replacement
- ☐ Total shoulder replacement
- ☐ Rotator cuff repair
- ☐ Back surgery
- ☐ Other (please list)

11. What topics are covered in the preoperative education program at your facility for total knee replacement?
- ☐ How to prepare for surgery
- ☐ Details of the surgical procedure
- ☐ What to expect while in the hospital
- ☐ The recovery process
- ☐ Self-care (such as dressing, bathing, toileting) for the postoperative phase
- ☐ Functional mobility (such as transfers) for the postoperative phase
- ☐ Weight-bearing status
- ☐ Edema management
- ☐ Information about the continuous passive movement machine
- ☐ Instrumental activities of daily living (such as completing laundry and caring for the home) for the postoperative phase
- ☐ Adaptive equipment
- ☐ Home modifications
- ☐ Home safety
- ☐ Managing pain
- ☐ Caregiver training
- ☐ Exercise before and/or after surgery
- ☐ Precautions
- ☐ Anatomy of the knee joint
- ☐ When to resume normal activities at home
- ☐ Expected functional outcomes
- ☐ Nutrition (such as increased protein and fiber intake)
- ☐ Other (please list)

12. What instructional methods are used to deliver preoperative education at your facility for total knee replacement? Check all that apply.
- ☐ Verbal instruction
- ☐ PowerPoint
- ☐ Healthcare provider demonstration
- ☐ Written instruction (such as handouts)
- ☐ Video
- ☐ Workbook
- ☐ Client demonstration/teach back
- ☐ Online education
- ☐ Other (please list)

13. How long before the planned total knee replacement does preoperative education most often occur at your facility?
- ☐ Less than 1 week
- ☐ 1 week
- ☐ 2 weeks
- ☐ 3 weeks
- ☐ 4 weeks
- ☐ 5 weeks
- ☐ 6 weeks
- ☐ 7 weeks
- ☐ 8 or more weeks
- ☐ Not sure

14. How many preoperative education sessions do clients typically attend at your facility for total knee replacement?
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more
- ☐ Not applicable (if education does not occur in person; automatic skip to 16)

15. How long do preoperative education sessions for total knee replacement typically last at your facility?
- ☐ Less than 15 minutes
- ☐ 15 minutes to less than 30 minutes
- ☐ 30 minutes to less than 1 hour
- ☐ 1 hour to less than 1.5 hours
- ☐ 1.5 hours to less than 2 hours
- ☐ 2 hours to less than 2.5 hours
- ☐ 2.5 hours to less than 3 hours
- ☐ More than 3 hours

Recommended design of preoperative education at your facility

16. What additional disciplines or providers who are not currently involved in the preoperative education program for total knee replacement at your facility do you feel would be beneficial to add to the program?
- ☐ Nursing
- ☐ Physical therapy
- ☐ Occupational therapy
- ☐ Social work
- ☐ Case management
- ☐ Dietetics
- ☐ None
- ☐ Other (please list)

17. What topics are not currently covered in the preoperative education program for total knee replacement at your facility that you feel would be beneficial to add to the program?
- ☐ How to prepare for surgery
- ☐ What to expect while in the hospital
- ☐ The recovery process
- ☐ Self-care (such as dressing, bathing, toileting)
- ☐ Functional mobility (such as transfers)
- ☐ Instrumental activities of daily living (such as completing laundry and caring for the home)
- ☐ Adaptive equipment
- ☐ Home modifications
- ☐ Home safety
- ☐ Managing pain
- ☐ Caregiver training
- ☐ Exercise before and/or after surgery
- ☐ Precautions
- ☐ Anatomy of the knee joint
- ☐ When to resume normal activities at home
- ☐ Expected functional outcomes
- ☐ None
- ☐ Other (please list)

18. What instructional methods are not currently being used to deliver preoperative education at your facility for total knee replacement that you feel would be beneficial to add to the program?
- ☐ Verbal instruction
- ☐ PowerPoint
- ☐ Healthcare provider demonstration
- ☐ Written instruction (such as handouts)
- ☐ Video
- ☐ Workbook
- ☐ Client demonstration/teach back
- ☐ Online education
- ☐ Other (please list)

19. When preoperative education for total knee replacement is provided in a group format (either partly or in full), which structure do you think is best for providing this education?
- ☐ Educating patients with planned total knee replacement separately from other diagnoses
- ☐ Educating patients with planned total knee replacement together with other orthopaedic diagnoses

20. What format do you feel would be best for providing preoperative education before total knee replacement?
- ☐ Individual
- ☐ Group
- ☐ A combination of group and individual

21. How long before the planned total knee replacement do you feel that preoperative education should occur?
- ☐ Less than 1 week
- ☐ 1 week
- ☐ 2 weeks
- ☐ 3 weeks
- ☐ 4 weeks
- ☐ 5 weeks
- ☐ 6 weeks
- ☐ 7 weeks
- ☐ 8 or more weeks
- ☐ Not sure

22. How many preoperative education sessions do you feel that patients should attend before total knee replacement surgery?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more
- ☐ Not applicable (if education does not occur in person)

23. How long do you feel that preoperative education sessions should last for total knee replacement?

- ☐ Less than 15 minutes
- ☐ 15 minutes to less than 30 minutes
- ☐ 30 minutes to less than 1 hour
- ☐ 1 hour to less than 1.5 hours
- ☐ 1.5 hours to less than 2 hours
- ☐ 2 hours to less than 2.5 hours
- ☐ 2.5 hours to less than 3 hours
- ☐ More than 3 hours

24. Are there any other additions or alterations needed to the current preoperative education program at your facility for total knee replacement that you feel would be beneficial for your clients? If so, please list these additions or alterations.