

Health Care Professionals' Perceptions of the Arthroplasty Patient Experience: Planning Phase in the Development of a Patient-Reported Outcome Measure

Louise H. Strickland, BN, MSc, RN, Laura Kelly, BA, MSc, DPhil (Oxon),
Thomas W. Hamilton, MBChB, BSc (Hons), MSc, MRCS,
David W. Murray, MA, MD, FRCS (Orth),
Hemant G. Pandit, MBBS, MS (Orth), DNB (Orth), DPhil (Oxon), FRCS (Orth),
Crispin Jenkinson, BA, MA, MSc, DPhil

Purpose: *The aim of this study was to explore health care professionals' perceptions and perspectives of surgery and early recovery for patients undergoing lower limb arthroplasty.*

Design: *Thematic analysis with semi-structured qualitative interviews.*

Methods: *Following ethical approval, interviews were performed with recovery room nurses (n=3), ward nurses (n=2), surgeons (n=5), anaesthetists (n=5), physiotherapists (n=5), and occupational therapists (n=2). Data were analyzed using an in-depth narrative thematic analysis method. NVivo qualitative data analysis software was used.*

Findings: *Three main themes evolved from the interviews: immediate patient recovery issues, discharge criteria, and priorities during hospitalization from health care providers' perspectives.*

Conclusions: *The early postoperative recovery period can be a challenging time for health care providers and patients alike. However, identifying key areas of importance can provide insight and guide focus in clinical practice, thus improving patient recovery.*

Keywords: *orthopaedics, patient care team, qualitative nursing research, perioperative period.*

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Louise H. Strickland, BN, MSc, RN, Oxford Orthopaedic Engineering Centre (OOEC), Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS), Botnar Research Centre, University of Oxford, Headington, Oxford, England, United Kingdom; Laura Kelly, BA, MSc, DPhil (Oxon), Nuffield Department of Population Health, University of Oxford, Headington, Oxford, England, United Kingdom; Thomas W. Hamilton, MBChB, BSc (Hons), MSc, MRCS, OOEC, NDORMS, Botnar Research Centre, University of Oxford, Headington, Oxford, England, United Kingdom; David W. Murray, MA, MD, FRCS (Orth), OOEC, NDORMS, Botnar Research Centre, University of Oxford, Headington, Oxford, England, United Kingdom; Hemant G. Pandit, MBBS, MS (Orth), DNB (Orth), DPhil (Oxon), FRCS (Orth), OOEC, NDORMS, Botnar Research Centre, University of Oxford, Headington, Oxford, England, United Kingdom, and Leeds Institute of Rheumatic and Musculoskeletal Medi-

cine, University of Leeds, Chapel Allerton Hospital, Leeds, England, United Kingdom; and Crispin Jenkinson, BA, MA, MSc, DPhil, Nuffield Department of Population Health, University of Oxford, Headington, Oxford, England, United Kingdom.

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Address correspondence to Louise H. Strickland, Oxford Orthopaedic Engineering Centre, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Botnar Research Centre, University of Oxford, Windmill Road, Headington, Oxford OX3 7LD, United Kingdom; e-mail address: louise.strickland@ndorms.ox.ac.uk.

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WORLDWIDE, ARTHRITIS IS INCREASING in incidence every year. Arthritis is the fourth most common cause of disability in the United States.¹ One-third of people older than 65 years present with symptoms of arthritis in the United Kingdom.² In 2017, the World Health Organization recognized arthritis as one of the world's ten most disabling conditions.³ Hip and knee arthroplasty are established procedures for symptomatic arthritis that has not responded to medical management.⁴ The main goals of these surgeries are to restore movement and function, improve quality of life, and decrease pain.⁵ With the increasing incidence of these surgeries, perianesthesia professionals will continue to see increases in the number of patients undergoing these procedures. The latest figures report that around 160,000 total hip arthroplasties (THAs) and total knee arthroplasties (TKAs) are performed in the United Kingdom annually⁴ and approximately 1 million per year in the United States.^{6,7}

Despite the extent of surgical procedures for arthritis, there exists a lack of research in the early recovery period (the first few days and weeks) after surgery,⁸ and no gold standard exists in terms of a care pathway or outcome measure to evaluate recovery.^{9,10} In an attempt to provide answers to some of these important questions, the James Lind Alliance was formed. This collective patient and clinician research initiative from the UK National Institute for Health Research has devised a "Top Ten" priority list for arthroplasty patients and their care providers. The James Lind Alliance found that the number one research priority for the lower limb arthroplasty population is identification and measurement of patient and clinical outcomes after both THA and TKA.¹¹ In research it is important to attempt to answer not only unanswered questions but also, in particular, those questions, which are important to both patients and clinicians alike. In addition, these top ten research priorities comprised many immediate perioperative concerns including pain management, modifiable factors, and timing of interventions and follow-up.

Optimizing patient recovery after surgery holds benefits for everyone, including patients, health care providers, and hospital trusts. Enhanced recovery protocols (ERPs) aimed at reducing the surgical stress response have now evolved to

address many of the factors involved in a patient's short-term recovery from surgery.

These ERPs use multimodal techniques, from pre-operative education to surgical site local anesthetic wound infiltration. They have been found to reduce perioperative pain and opiate consumption and are also associated with significant financial savings to the hospital system through reduced length of stay (LOS) and a reduction in the associated costs of extended in-patient hospitalization. Short-term benefits of their use have been reported to result in reduced long-term patient morbidity and mortality, as well as improved functional outcomes. The introduction of early postoperative physiotherapy on the day of surgery has also been reported to decrease LOS. ERPs are a multifactorial process, and the individual success of their component parts is still not fully understood.¹² In spite of these improvements, 40% of arthroplasty patients experience severe acute postoperative pain preventing their progress in the early recovery period.¹³ Pain is also a common cause of delayed discharge and readmission.¹⁴

Reduced LOS is not necessarily an indication of a positive outcome for the patient. A shortened LOS can be achieved by the use of increased opiate medication, which can bring additional challenges for the patient and health care provider. In addition, LOS does not represent whether patients have positive or negative experiences of health services.

Patient-reported outcome measures (PROMs) are questionnaires used to measure long-term health improvement in patients and have been used in patients undergoing hip and knee arthroplasty¹⁵. They have been in routine use within the National Health Service (NHS) since 2009. NHS patients receiving varicose vein and hernia surgeries also have their long-term outcomes recorded with PROMs.¹⁵ Most often PROM data are collected in the mid-term to long-term recovery periods of 6 months and longer. However, they are rarely used in the early recovery period. As mentioned previously, improving early recovery is believed to have long-term implications. At the present time, there are no fully validated tools to assess early postoperative recovery during the first week

after lower limb arthroplasty. A brief, easy-to-complete, reliable patient-reported tool could be of great use. It could not only aid in the assessment of recovery but also could be used to evaluate the efficacy of perioperative interventions such as drugs or surgical technique and provide a foundation for evidence-based care.

As a precursor to this study, a systematic review of measures used to evaluate recovery after lower limb arthroplasty was carried out⁹. Twenty-three articles related to the development, assessment, and validation of 15 tools were found. Instruments demonstrated varying levels of quality based on following recognized criteria: appropriateness, acceptability, precision, reliability, validity, and responsiveness to change over time.¹⁶ None of the tools found were specific to both the orthopaedic arthroplasty population and early recovery time periods. The available tools were not sufficiently sensitive to evaluate quality of recovery in the early perioperative period. Sensitivity to change, or responsiveness, in outcome measures, refers to the ability to detect the often subtle changes that can be of importance clinically and to the patient.¹⁶ The findings of this systematic review led to the current qualitative work with the goal of developing an early recovery PROM.

PROM development is a multiphased iterative process.¹⁷ The Food and Drug Administration has developed a guidance document for best practice development of outcome measures. The five stages in the development of a PROM are as follows:

- Hypothesize conceptual framework.
- Adjust conceptual framework and draft instrument.
- Confirm conceptual framework and assess other measurement properties.
- Collect, analyze, and interpret data.
- Modify instrument.

This study falls within the initial phase of hypothesizing the framework for the PROM. This includes defining the study group, literature review, and expert consultation. The expert interviews provide the developers with potential topics, layout, or structure of the measure. The next steps in the study will involve in-depth interviews with the patients'

themselves to fully explore the patient-reported issues directly.

Objectives

The aim of this study was to explore the health care professionals' perceptions of surgery and early recovery, particularly the first days and weeks after surgery, for patients undergoing lower limb arthroplasty. These professional interviews formed the planning phase of the study. As potential users of the tool, their experience with the early recovery period will be used to enhance the PROMs' structure and possible layout.

Materials and Methods

Design

The study used a qualitative thematic analysis design. Semistructured interviews were used to explore health care professionals' experience and perspective of early recovery for patients undergoing THA or TKA.

Setting and Sample

The study was conducted at a 160-bed specialist orthopaedic hospital within the NHS, England, United Kingdom. The hospital performs elective orthopaedic surgeries. All participants were recruited from the hospital. All participants were purposively sampled¹⁸ health care professionals who care for THA or TKA patients. Participants found out about the study through word of mouth. Inclusion criteria for the participants in the study were as follows:

- Willing and able to give informed consent for participation in the study.
- Able to communicate in English.
- An employee of the hospital.
- In one of the health care provider groups.
- Provides care for lower limb joint replacement surgery patients.

Exclusion criteria for the study were age less than 18, lacking the capacity to consent, or unable to comprehend or provide informed consent.

A multidisciplinary group of health care professionals who provide care across the

perioperative continuum were interviewed. The individuals participating represented a vast range in terms of experience to allow for the maximum possible generation of ideas. They included consultant surgeons and anaesthetists, nurses, physiotherapists, and occupational therapists. Twenty-two participants were recruited to the study with years of experience caring for orthopaedic patients ranging from 1 to 35 years (Table 1).

Ethical Consideration

Ethics approval was obtained (Reference 16/NW/0236) from the Health Research Authority North West—Liverpool East Research Ethics Committee. If interested in possible participation, eligible participants were approached by a member of the research team and given information about the study and time to consider whether they wished to take part in the study. Time was also given for any questions or concerns. Written informed consent was then obtained.

Data Collection

After ethical approval and the informed consent, interviews were performed with health care providers. The aim of these interviews was to identify

factors pertinent to patients in their early surgical recovery. Interviews were semistructured in nature with prompts and open-ended questions. These prompts and questions encouraged exploration of the health care providers' experience, role, and how they viewed their patients' early surgical recovery (Table 2). Interviews were audio recorded. The duration was approximately 30 minutes or less for each interview. On completion of each interview, field notes were recorded to document particular details about the process. These notes included reflection on participant responses, the physical environment, and the researcher's personal reflections. The interviews were then anonymously transcribed. Interviews were transcribed from the audio recordings by a member of the research team within the university. Any identifying contextual names were removed.

Analysis

Data were analyzed using a thematic analysis method¹⁹ and using NVivo software (NVivo qualitative data analysis Software; QSR International Pty Ltd, Version 11, 2015). Anonymized transcripts were used. At the time of transcription, all identifying details were removed. Analyses were performed on an ongoing basis and as part of an

Table 1. Characteristics of Participants

Parameter	Gender Male/Female	Length of Time in Career (Range)
Male/female (% male)	10/12 (45.45)	
Ethnicity (n/%)		
Arab people	1 (4.54)	
White British	14 (63.64)	
African	1 (4.54)	
Indian	1 (4.54)	
Other white	4 (18.18)	
Irish	1 (4.54)	
Employment role (n/%)		
Registered nurse	0/5	1-24
Orthopaedic surgeon	5/0	8-21
Anaesthetist	5/0	15-22
Physical therapist	0/5	5-33
Occupational therapist	0/2	12-35
Length of time in career overall (y; mean/SD/range)		16.39 (9.23) 1-35

Ethnicity categories from Office for National Statistics, census 2011.

Table 2. Participant Interview Prompts

-
- Hello, introduction
 - Explanation of why I'm speaking with you today
 - What is your role?
 - Length of time in career?
 - What are the main concerns you see with your patients?
 - What are your main concerns? Why?
 - What are your discharge criteria for patients?
 - What are the priorities for patients during hospitalization from your perspective?
 - Any other ideas or anything else you'd like to add?
-

iterative process as the interviews were being completed. The sample size was guided by data saturation,²⁰ which is the time at which subsequent interviews did not produce any new themes. Interviews were coded based on the participants' words and context (Table 3). Topics that are important to professionals in patient recovery were recorded. Themes evolved from recurring words and ideas from the participants.²¹ Independent analyses of the interviews were performed by the first reviewer, a member of the research team. Initial coding of the first few interviews was performed independently by two reviewers to ensure thorough coverage of the work and discussed. The coding sheet was developed and refined as the analysis progressed. Any unresolved concerns were taken to a third researcher, an expert in qualitative research, for resolution.

Rigor

Validity and reliability are important issues to address in both quantitative and qualitative research.²² As such, acknowledging the potential for interviewer bias in this area of research is necessary. To minimize the risk of bias, the interviewer examined his own motivation before commencing the project. During the study, extensive interviewer field notes and reflection on methods and practice were used. As mentioned previously, confirmatory analysis with both the first and second reviewers was performed to assist in strengthening the reliability of the work. Member checking was performed on an ongoing basis to confirm or discuss emerging themes.²³ The reporting of this study was carried out in accordance

with recognized guidelines and standards for qualitative research.²⁴

Research Team

The research team consisted of a registered nurse who was a doctoral student, a qualitative researcher, an orthopaedic trainee and doctoral student, two orthopaedic surgeons who are also professors of orthopaedic surgery, and a psychometrician (health measurement scientist) and professor of health sciences research. The registered nurse on the team had more than 20 years of experience in nursing, research, and orthopaedic surgery. The qualitative researcher and orthopaedic trainee/doctoral student on the team both have more than 10 years of experience in orthopaedic surgery, outcome measurement, and pharmacology. The two orthopaedic surgeons have more than 20 years of experience in orthopaedic surgery, patient outcome measurement, and research. The psychometrician on the team has more than 20 years of experience in statistics, research, patient outcomes, psychological measurement techniques, and development.

All members of the team have been involved in the research concept, writing of the protocol, ethics application, and analysis.

Results

Participants and Demographics

A total of 22 participants were included in the study: 12 women (55%) and 10 men (45%) (Table 1). The sample consisted of nurses (n = 5), surgeons (n = 5), anesthetists (n = 5), physiotherapists (n = 5), and occupational therapists (n = 2). Ethnicities of the group were predominantly white British (64%) but also included Arab people, African, Indian, other white, and Irish. All have been working in the care of the arthroplasty patient for an average of 16.39 years (SD = 9.23). All participants work in the same orthopaedic hospital setting. Specifically, within the nursing participants, four were of white British and one of African ethnicity. The surgeon group consisted of three white British, one other white (Australian), and one Arab person. The anesthetists were represented by two white British, two other white (Russian and South African), and one

Table 3. Planning Phase Coding Sheet V3

1. Demographics
1.1 Sex
1.2 Employment role
1.3 Length of time in career
1.4 Specialty area
2. Immediate patient recovery issues
2.1 Pain
2.2 Nausea and vomiting
2.3 Bladder and bathroom
2.4 Anxiety
2.5 Complications
2.6 Medications
2.7 Mobility and range of motion
2.8 Mental health
2.9 Expectations, motivation, and goals
3.0 Discharge
3.1 Home situation: support and family at home
3.2 Other
4. Discharge criteria
4.1 Physiotherapy satisfaction
4.2 Physician satisfaction
4.3 Patient satisfaction
4.4 Patient safety and ability to resume tasks at home
5. Priorities from health care providers' perspective
5.1 Pain
5.2 Nausea and vomiting
5.3 Range of motion and ability to mobilize
5.4 Eating and drinking
5.5 Home environment and support networks
5.6 Patient safety
5.7 Patient expectations and education
5.8 Anesthetic
5.9 Postoperative environment and care
6.0 Satisfaction and feeling of well-being

Indian. The physiotherapy group consisted of three white British, one Irish, and one other white (Portuguese). The occupational therapists were both white British. The surgeon and anesthetist group were all male. The other three groups were all female.

Three main themes evolved from the interviews: immediate recovery issues ($n = 22$), discharge criteria ($n = 22$), and priorities during hospitalization from health care providers' perspective ($n = 22$).

Immediate Patient Recovery Issues

Within this broad overall theme, following sub-themes emerged: pain and medications; nausea

and vomiting; bladder or bathroom; anxiety and mental health; mobility and range of motion; expectations, motivation and goals; and discharge and home situation.

All participants recognized pain as the primary postoperative issue for patients. "The main issue is pain" (participant 4, surgeon). They expressed in detail how it affects the overall recovery and well-being of the patient in the early recovery period. Pain can limit postoperative mobilization and physiotherapy and can lead to complications and increased LOS for some patients, which can in turn affect patient satisfaction and their long-term recovery. One participant felt that patients undergoing TKA seemed "to suffer a little bit more" than THA (participant 3, nurse). Another felt that "generally they are the same across the board but obviously it varies in extent depending on the type and duration of surgery" (participant 8, anesthetist). Pain management was seen as something that can be "extremely variable and can be difficult to manage particularly in people who are on a lot of strong analgesia before they come in" (participant 10, surgeon). Medications were also viewed as challenging for patients. Prior medication use, side effects, and getting the balance right between being overmedicated and in pain were expressed. "More so I would say that we would seem to be over giving them stuff that some individuals maybe don't need as much analgesia as some of the others so it knocks them for six" (participant 3, nurse). Medication delivery and pain management were reported to be "very dependent on the expertise of people who are around at the time" (participant 10, surgeon). As a direct result of medication use, at times, patients had been seen to "get more constipated, dehydrated and they feel worse in the whole process" (participant 10, surgeon).

Nausea and vomiting and issues around using the bathroom were also seen as significant issues in the immediate postoperative phase. Anxiety was reported in relation to many of the other issues discussed. Some providers reported that patients demonstrated a sense of relief that the surgery was over, but concern and some worry over just how their recovery would progress. If a patient had prior experience with surgery, this could either alleviate some of the anxiety or worsen it depending on experience. "They worry about how

their pain is going to be maintained and controlled and will they be able to have the comforts they desire" (participant 7, nurse). A patient's mental health and appropriate allocation of care for it was considered as a concern in the early recovery period (participant 2, nurse).

Participants described how patients face challenges with regaining postoperative mobility and range of motion. Participants felt that patients are mostly "functional goal oriented" (participant 20, physiotherapist) and keen to know what they "can and can't do" (participant 14, physiotherapist) after surgery. "Often we get the knees affected by block. You don't see patients not mobile because they are in pain" (participant 2, nurse). Being "able to do stairs" (participant 16, physiotherapist) is a commonly reported goal.

Expectations, motivation, and goals were found to be of importance by participants for the patient as they embarked on recovery. These were observed to affect many different aspects in the early recovery period. "People have lives, you know. People want to go back to dancing. They want, you know—you have got youngsters wanting to rock climb. They've got their jobs. They have got their mortgage to look after. They have a life and we need to be proactive in saying this is how you manage life with a joint replacement—yes" (participant 2, nurse).

The timing and concept of discharge home from hospital were a cause for both concern and relief for patients. Health care providers reported that while some patients were keen for a speedy discharge, to recover in their home environment, others were content to stay in hospital for an extended period of time. The issue of patient dissatisfaction with delay in discharge because of lack of timely drugs arriving from the pharmacy was considered. Participants noted that work was underway to improve the length of time it took for medication to reach the patient from the pharmacy.

A patients' home situation, including the level of support and family members at home, was also found to be relevant. Patients were reported to have concerns over "how are they going to cope at home if they live on their own" (participant 17, physiotherapist) or how they would manage

if they are the primary "carer for others" (participant 21, occupational therapist).

One professional felt that as health care professionals it is important to maintain a holistic view of the recovery period. "We get over obsessed about pain and not look at the other things that patients might have a better stay though" (participant 9, anesthetist).

Discharge Criteria

As the interviews and ongoing analysis evolved, participants addressed specific criteria in relation to what they wanted to see before the patient would be discharged home. This comprised physiotherapy satisfaction, physician satisfaction, patient satisfaction, patient safety, and ability to resume tasks at home.

All participants reported that successful assessment by the physiotherapist was one of the most important criteria for discharge. "The physio has said they can go home and the doctor is happy with them" were seen as definitive markers of a patient's readiness for discharge (participant 3, nurse). Patient satisfaction was seen to be closely linked with discharge. "Patient expectation is very key with regard to discharge planning" (participant 21, occupational therapist). "It's the thing that people care about and whether they feel like they have been supported and facilitated" (participant 13, surgeon). Participants noted that a shared understanding of the anticipated discharge was important. "Our expectations are the same, that you know that we are very clear" (participant 3, nurse). "Safety and mobility are the key things in terms of discharge for patients" (participant 20, physiotherapist). "We can teach them safe techniques and if you teach them correctly it empowers them" (participant 2, nurse). "So the main things, very much back to the basics of what we need to do as humans on a daily basis is what we look at. We scratch the surface sometimes in terms of younger patients who want to return to work, but on the whole, with such a short length of stay, it is very much kind of washing, dressing, domestic mobility, transfers and that's pretty much what we look at. Obviously, if they are needing support we can look at onward referrals to care services or for rehab beds" (participant 22, occupational therapist).

Priorities During Hospitalization From Health Care Providers' Perspective

This theme displayed some interesting subthemes from the health care professionals' perspectives: pain; nausea and vomiting; range of motion and ability to mobilize; eating and drinking; home environment and support networks; patient safety; patient expectations and education; anesthetic; postoperative environment and care; and satisfaction or feeling of well-being.

"The main issue is pain relief. Second I would put nausea and vomiting, Third I would put is mobility, eating and drinking and, although I am not a surgeon, most patients ask me when will I be able to go home" (participant 8, anesthesiologist). "They get nauseated from the morphine and things and this can be a bit of a knock on effect" (participant 5, nurse).

One participant saw patients who had "adapted to strong pain relief so managing that is something that is very dependent upon the expertise of people who are around at the time and how well that is managed. Sometimes if you bring them an ice pack and put it over the wound that is just as effective if not more so than a big slug of an opiate analgesia that will make you feel horrible" (participant 10, surgeon).

Again the ability to effectively negotiate the stairs was seen as essential. "If they need to do stairs, some people don't have stairs and say I never come across them and don't do them, but yes of course that's important. Sit to stand; you have to be able to get out of a chair. It's the whole overall picture" (participant 18, physiotherapist). "When you are in hospital you have quite a lot of time on your hands" (participant 5, nurse). Using this time was seen as important.

The home setting and resumption of activities of daily living on return home were also seen as a priority. "Where they are, what is their home environment, what support networks do they actually have, the accessibility to shopping, what community support have they already got in place. Their medical history, their activity levels now, are they already able to get out shopping and be able to drive again? Being able to do the activities of daily living—yes—I think that's really important in assessing the patients" (participant 2, nurse).

Other priority issues included variability among the type of anesthetic and anesthesiologist. "In the postoperative phase the thing you really notice is which anaesthetist you have" (participant 4, surgeon). The difference in individual technique and type of anesthetic given, general or spinal, were reported to have major impact on patients and their immediate recovery.

Many professionals described the importance of repetition and reinforcement of information given to patients and families throughout the perioperative period. "What we do know is that patients only normally take in about 10% of the information you give them each time you see them so it is about giving them repetitive information and giving them information in different forms, not just verbally, but papers or websites and things like that to go to. It's just about reinforcing; it's very important about reinforcing the same message. I mean that's where a lot of the difficulty comes, where people start saying slightly different things" (participant 15, surgeon).

Discussion

Pain has long been seen as a postoperative issue.²⁵ Many participants in the study recognized pain as the most significant factor in recovery, particularly after knee replacement. The concept of patients with TKA experiencing more severe pain has been reported in the literature.^{26,27} In relation to pain management, nurses described their concern for patients receiving the correct medications. Some surgeons noted that it was important to acknowledge individual requirements for pain management as one standardized program does not work for all.

Anxiety, as discussed by the participants, has been identified in the early postoperative period, particularly in first few days²⁸ and was noted to affect many different aspects of a patients' recovery journey including pain and mobility. The anesthesiologist was seen by other team members as an important component of the multidisciplinary team. Anesthesiologists were also reported to factor, sometimes strongly, in individual patient recovery. In discussion, participants felt, anecdotally, that this was possibly because of a combination of factors. These factors included regularly caring for this specific patient population, skill as an anesthesiologist, and bringing a certain art to the science itself. This is in

agreement with prior research looking at postoperative recovery challenges.²⁹

Patient satisfaction is thought to be linked to a higher quality of recovery postoperatively.²⁶ It has also been shown that how the patient feels can be directly related to their level of satisfaction for the care received.³⁰ Patient satisfaction and improved outcomes do seem to be related in arthroplasty patients.

Interestingly, similarities were seen among the disciplines in terms of discharge criteria and priorities in care. Work performed by Broos and Fourneau³¹ demonstrated the importance of a patient's home situation in recovery and outcomes of surgery after discharge home from the hospital or rehabilitation center. Those with strong networks and families were found to have improved recoveries. Satisfaction in the care and relationship with hospital professionals was reported to improve not only a patients' outcome but also the ability to deal with affairs after discharge home.³² Pain has also been recognized as a cause for delay in discharge and readmission in arthroplasty patients.¹⁴

Participants felt that patients needed reinforcement of their changing requirements to prepare for discharge and the days following. Repetition and printed instructions with specific information including medications, wound care, and physical changes assisted with this. This need for reinforcement coincides with previous work after arthroplasty surgery.³³ Preoperative education has long been considered to be beneficial in the recovery process and timely discharge of patients after arthroplasty surgery,³⁴ a sentiment that was echoed in these findings.

Improvement in function and mobility are some of the key reasons for arthroplasty surgery. Having key skills such as managing the stairs and having confidence in the ability to do so were recognized as important. The physical recovery paired with self-efficacy that participants observed has been reported in the literature.³⁵

This study has shown key areas of focus for health care professionals in the early postoperative phase: immediate recovery issues, discharge

criteria, and priorities during hospitalization from health care providers' perspective. A patient's immediate physical symptoms in this perianesthesia phase become the health care providers' priority. When these immediate concerns are stabilized and under control, attention then turns to the imminent discharge and ensuring a safe transition into the home area.

Study Limitations

The demographic distribution of participants was somewhat mixed. However, it is important to acknowledge that cultural differences may exist between other groups. As this study was carried out in the United Kingdom and in an NHS hospital, it may only be applicable in the NHS. The lack of open-ended questions is another limitation. In addition, all participants in the study were recruited from and employed by the same institution in the United Kingdom. This may be a limitation in terms of external validity.

Conclusions and Relevance to Clinical Practice

Understanding the issues that health care professionals observe can provide insight into how to best care for the patient. With current trends in health care moving toward enhanced early recovery, this work shows key issues for the hip and knee patient directly from the front line. This study has also served as exploratory work in the development of a questionnaire, which may be used to assess interventions in the lower limb arthroplasty population. The ability to measure improvement in patient-reported issues after arthroplasty could be of great benefit in clinical trials involving medication, care pathways, and implant selection. It could also potentially work to optimize routine care. Patient-identified issues can give vital insights into a patients' perspective through the perioperative experience and can allow provision of appropriate, safe, timely care, and interventions.

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