A Patient Satisfaction Survey Investigating Pre- and Post-Operative Information Provision in Lower Limb Surgery

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Abstract

Background

Planned lower limb surgery is common, with over 90,000 hip replacements, 95,000 knee replacements and 15,000 anterior cruciate ligament reconstructions performed in the UK each year. Patient satisfaction an important element of healthcare provision that is usually measured by functional outcomes but influenced by many other factors. Few studies have assessed patients’ views on the information given to them pertaining surgery and patients are infrequently consulted when designing leaflets and information packs which can lead to confusion during the recovery period and poor long-term outcomes. We aimed to assess if patients were satisfied with the information they received around their operations and identify potential improvements.

Methods

Set in a major trauma centre in the West Midlands, a multiple choice and free-text answer survey was administered to patients who used the orthopaedic service over the course of one month. Surveys were designed in Qualtrics and administered face-to-face on paper. Thematic content analysis was performed.

Results

Eighty patients completed the survey, of which 88.8% of patients were satisfied with the information they received. Discussions with surgeons were the most useful resource and 53% of patients requested more internet resources. Post-operative patients were statistically more likely to be dissatisfied with information provision. Over 20% of patients requested more information on post-op pain and recovery timelines.

Conclusions

Although patients were satisfied in general, areas for change were identified. Suggested improvements take the form of webpages, a mobile platform or forum for asking healthcare professionals questions. Extra resources could contain educational videos, patient experiences and an interactive recovery timeline. These suggestions may enable NHS Trusts to “get into the digital age”, however, more research on patient satisfaction around information provision and the impact it has on recovery and decision making is needed.

Background

Planned lower-limb operations, such as knee and hip replacement, can be very effective treatments which are becoming increasingly commonly used.\(^1\)\(^–\)\(^3\) Over 92,000 hip and 98,000 knee arthroplasty operations were performed across the UK in 2018, an increase of 53% and 37% respectively since 2007.\(^4\) However, patient dissatisfaction after knee arthroplasty is high, estimated to range between 8–17%.\(^5\)\(^,\)\(^6\)
Non-joint replacement operations are also common in the lower limb. It is estimated that over 15,000 ACLR (Anterior Cruciate Ligament Reconstruction) operations are performed in the UK each year. Additionally, approximately 40,000 meniscal injuries requiring meniscectomy occur in the UK per year. These procedures have also been impacted by overly optimistic expectations, which may lead to long-term dissatisfaction with their outcomes.

Previous studies have measured satisfaction as well as functional outcomes or Patient Reported Outcomes (PROs) in lower limb surgery, concluding that three elements are key in maintaining high levels of satisfaction. These include meeting preoperative expectations, adequate pain relief and the patient’s subjective hospital experience. The strongest predictor of dissatisfaction after a total knee replacement has been found to be the failure to meet patients’ preoperative expectations, this has also been a factor in ACLR procedures. This demonstrates a lack of information being passed on the patient or a lack of understanding of the information being given.

Measuring outcomes has become an increasingly important tool in the field of medicine, however satisfaction largely remains an undefined and difficult to measure parameter, especially regarding information provision within a clinical setting. Whilst PROs have become established, with a multitude of validated tools for healthcare quality measurements, patients are sometimes disappointed that questionnaires often do not ask the right questions from the patient's perspectives. Even though evaluators use satisfaction as a single measure to reflect quality, the concept is multifactorial and requires capturing patient views more comprehensively than just the simple satisfaction scales frequently used in surveys. To fully capture the patient experience, open ended questions and a more detailed assessment are needed to enable patients to offer a holistic view on the information and care they received.

It has been suggested that by ensuring adequate patient education and realistic goal setting, patient satisfaction could be improved. Additionally, with the WHO’s global strategy on people-centred care and integrated health models becoming more prevalent, a simple yet effective method of ensuring the patient is at the heart of clinical decisions must be identified and utilised. This must provide relevant, effective and tailor-made information in the medium best suited to or requested by the patient, to ensure they are able to make the most informed decision possible. To achieve both these targets, we must first ascertain if patients are satisfied with the information they receive, pertaining their operations.

Currently, information wise, patients receive a consultation with a surgeon, and an appointment with a physio prior to their operation, they may also receive a leaflet relevant to their operation. Patients undergoing joint replacement procedures will be invited to a group session to discuss exercises and extra support options. Post-operatively, all patients are given further appointments with their surgeon, and an appointment with a physiotherapist. With there being limited research in this field, the primary aim of this project is to evaluate patient satisfaction with the information given to them whilst under the care of the lower limb surgical team service within a tertiary orthopaedic centre in the West Midlands and identify
ways to improve it. The project also aims to assess whether sub-groups of the patient population require different resources, in order to propose ways of achieving more effective information provision.

Methods

Study design:

The study utilised a patient survey, designed by the team with input from expert patients and experienced healthcare professionals (see supplementary information). It included both closed and open-ended questions and was administered face-to-face to patients attending the orthopaedic department at a major trauma centre in the West Midlands (UK).

Questionnaire design:

No previous study had assessed the satisfaction of the information given to patients and so the questionnaires were based on existing literature as well as expert clinician’s input and existing practices and procedures. The questionnaire was designed in Qualtrics (Qualtrics International Inc., Utah, U.S.) and had three parts entitled demographics, pre-op questions and post-op questions. Demographic data was collected to identify if certain characteristics could be related to the level of satisfaction or information needs. Identical questions were given to both pre- and post-operative patients where possible. In some instances, changes to question wording was required. Where similar questions and responses were recorded, the responses were amalgamated during analysis. Open-ended questions were used to give the opportunity for patients to write their own suggestions, guided by previous literature. Questions were structured in various styles including tick boxes, matrixes and free-text boxes. Satisfaction was scored by the patients using a Likert scale with five options. Paper copies of the questionnaire were given to patients and was the preferred method of data collection as poor mobile signal in hospital sites made online questionnaires impracticable.

Sample:

Patients were identified by the referring surgeon, contacted by the researcher and invited to participate in the survey on the day of their procedure or during a follow-up appointment. Patients were given a patient information leaflet informing them of how to take part as well as the risks and benefits of doing so and a contact in case of queries or problems. They were informed that completion of the questionnaire and returning it was taken to mean that they consented to the study, they were also given an information leaflet containing details of data use and how to withdraw. Convenience based sampling was used, whereby those who turn up during the data collection timeframe and accept will be included. The survey was anonymous. No patient identifiable data were collected. Patients could not withdraw their data after completing the survey as no identifiers were used.

Inclusion Criteria:
Patients must have had lower limb surgery or be on the waiting list for surgery of the hips or knees. Example procedures included but were not limited to joint replacements, cruciate ligament repair, meniscal repair or labral repairs. Patients were excluded if they had to undergo a non-elective surgical procedure. To be eligible for the pre-operative section, patients must have been approached on the day of the surgery. Post-operative patients should ideally have been three to six weeks follow-up but must have been within one year of having their operation.

**Data collection, storage and analysis:**

Patients were given a hard copy of the questionnaire and asked to complete and return it. The results were then transcribed by the researcher to the Qualtrics database. At the end of the four-week data collection period, the results data were downloaded, analysed and any hardcopies shredded. The questionnaire was piloted prior to wider use. Questions that had similar themes were aggregated if possible and scores of “extremely satisfied” or “satisfied” were counted as “satisfied”, with “neither satisfied or dissatisfied”, “dissatisfied and “extremely dissatisfied” counted as dissatisfied with the service received. Quantitative data was analysed in SPSS (V26, IBM, New York, U.S.) and relevant statistical tests were performed. Where percentages are given in the results section, this demonstrates the number of respondents who ticked the associated box. Free text boxes were included within the questionnaire and a thematic content analysis was performed on these responses whereby qualitative data was coded in themes relating to the question asked using NVivo (V12, QSR International, Melbourne, Australia). During survey administration, field notes were made. These were included within the patients’ responses and themed accordingly during analysis.

Statistical analysis included Chi-squared testing for binary data in two by two tables. Where a value within the table was less than five, Fisher’s exact tests were performed. These parametric tests were chosen to adequately assess the equality of fit and proportional distribution between categories to identify statistically significant results. In this exploratory analysis, multiple testing corrections were not employed. Therefore, the statistical analysis should be interpreted as exploratory in nature and not confirmatory.

**Results**

**Demographics**

Eighty patients filled out a questionnaire, with 35 (44%) filling in the pre-op section and 45 (56%) filling in the post-op section. Overall, 71 out of 80 patients (88.8%) indicated they were satisfied or extremely satisfied with the information they had received pertaining their operation. Demographic information can be seen in the Table 1, there were no statistically significant characteristics that influenced satisfaction. When taking into consideration the nature of the operation, 41 of 47 (87%) patients undergoing joint replacement therapy were satisfied with the information they received and 30 of 33 (90.9%) patients undergoing reparative procedures indicated the same. There was a statistically significant difference between the satisfaction of patients pre- and post-operatively. Patients were more likely to be satisfied
with the information provision pre-operatively ($P = .036$, Fisher’s exact test) and post-operative patients were less likely to be satisfied with the care they were provided ($P = .004$, Fisher’s Exact test).

Patient satisfaction with the care they received followed the same pattern with 71 of all patients (88.8%) indicating they were satisfied or extremely satisfied with the care they had received and the subgroup values also reflecting similar results as the information evaluation data.

### Usefulness of resources

Patients were asked to rate the usefulness of specific resources they were given before their operation. These results can be seen in Table 2.
Table 2

| Resource (n = 80)       | Useful n= (%) | Not useful n= (%) | Did not use/ receive n = (%) |
|------------------------|---------------|-------------------|------------------------------|
| Leaflet                | 58 (72.5)     | 10 (12.5)         | 12 (15.0)                    |
| Internet Pages         | 18 (22.5)     | 12 (15.0)         | 50 (62.5)                    |
| Discussion with surgeon| 68 (85.0)     | 6 (7.5)           | 6 (7.5)                      |
| Friends and family     | 45 (56.3)     | 17 (21.3)         | 18 (22.5)                    |
| Mean                   | 47.3 (59.1)   | 11.3 (14.1)       | 21.5 (26.9)                  |

Sub-group analysis indicated three significant results from Chi squared tests. Friends and family (patients with similar operative experiences) were significantly more useful when consulted for reparative procedures as opposed to joint replacement $X^2 (3, n = 80) = 8.16, P = .017$. They were also rated to be more useful by post-operative patients $X^2 (2, n = 80) = 17.52, P < .001$. Leaflets were rated significantly more useful in post-operative patients than pre-operative ones $X^2 (2, n = 80) = 10.02, P = .007$.

**Resource medium:**

Before their operations, patients were asked what internet resources, if any, they had consulted. Of the 35 pre-op patients, 14 (40%) had looked at an “NHS website” and five (14%) had visited “WebMD”. They were also asked what resources they would have wanted to have access to before their operation, if they were to undergo it again, results can be seen in Table 3. Twenty pre-operative patients (57%) suggested they would have liked to have had a one to one with a patient who has previously undertaken the operation. Although three suggested that discussions with other patients, family and friends about their operation were negative experiences and proposed it might not be directly useful and more confusing. Four patients also suggested that if they were to have exposure to patients before their operation, it would be useful for these to be realistic and not just negatives or positives. Two patients suggested that blogs would be useful for them.
Table 3

 Frequency, percentage of answers and free-text responses related to suggestions

| Answer (n = 35)                                                                 | n = (%) |
|--------------------------------------------------------------------------------|---------|
| 1 to 1 with another patient who has had the procedure                        | 20 (57) |
| Leaflets                                                                        | 19 (54) |
| 1 to 1 with a healthcare professional                                        | 19 (54) |
| Group session with other patients                                              | 16 (46) |
| Internet page                                                                  | 15 (43) |
| App on phone                                                                   | 13 (37) |

Frequent free-text responses (n = 23):

| Internet | Positive (n = 4)                                                                 | “Most of the information found out about recovery was from webpages, including YouTube” – Pt 30 |
|-----------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
|           |                                                                                 | “Used internet to find out about surgeon and surgery. Videos for condition and pathophysiology” – Pt 20 |
|           | Negative (n = 3)                                                                | “Internet resources were very gory, too much information for me” – Pt 7                         |
|           |                                                                                 | “[The] internet had lots of information and confused me, especially the American sites.” – Pt 11 |

| Friends and family | Positive (n = 6)                                                                 | “Learnt from others about how to recover and what to expect” – Pt 32                           |
|                    |                                                                                 | “[My] Friend's husband had one some time ago and told me how good it was, he still golfs and bowls” – Pt 8 |
|                    | Negative (n = 3)                                                                | “Chatting with others gave me conflicting ideas that might not apply directly to my circumstances” – Pt 33 |

Question asked: “We have thought of a few ways to improve the service we provide, please tick those that would help you. If you had the procedure again”. Patient numbers and percentages are included next to their quote. Includes only pre-operative patients.

Post-op patients were asked by what means they received information after their operation and then by what means would they have liked to receive information. See figure one for results. In total, across both pre- and post-operative patient populations, 42 out of 80 (53%) patients requested more internet resources.

Figure 1) Received vs requested methods of receiving information for post-operative patients (n = 45)
Free text answers included six relating to E-resources and eight on patient interactions, with the majority suggesting timelines and videos to be posted on the web and requesting that if they were to speak with other patients, they would like a realistic representation of what the process will be like and even these may not be helpful to all.

**Additional information requests:**

All patients were asked if they were satisfied with specific topics relating to their surgery and which ones they would like more information on, the results can be seen in Table 4, below. Sixty five of the 80 patients (81%) identified at least one topic they would wanted to have received more information on.

*Table 4*

| Topic (n = 80)                                      | n = (%)          |
|----------------------------------------------------|------------------|
| Post-Op Pain                                       | 22 (27.5)        |
| How long to recover                                | 20 (25.0)        |
| How long before can work                           | 16 (20.0)        |
| Who will be in the operating room with you         | 8 (10.0)         |
| Pain medication                                    | 8 (10.0)         |
| Support available                                  | 7 (8.8)          |
| The procedure                                      | 6 (7.5)          |
| How to care for wounds                             | 6 (7.5)          |

**Frequent free-text responses (n = 47):**

**Recovery**

n = 16

“More information on recovery timelines and milestones” – Pt 38

“Specific restrictions - e.g. can I ever do breaststroke or lean over?” – Pt 78

“Medium to long term rehab - information dropped off after the first few weeks” – Pt 69

**Procedure**

N = 11

“How long would the surgery take?” – Pt 22

“What sort of hip it will be. (material)” – Pt 8

“How long the scar will be and where specifically it will be.” – Pt 7

**Physiotherapy**

n = 5

“More physio exercises/videos in the initial recovery phase” – Pt 80

“Consistency between physios” – Pt 4

**Driving**

n = 3

“More on driving - unsure if I can or not” – Pt 53
Readiness and recovery:

Of the 35 pre-operative patients, 25 (71%) did not have any questions on the day of their procedure and 30 (86%) felt the information they had been given was tailored to them and their procedure. Forty-one (91%) of the 45 post-operative patients indicated they were confident they knew what was involved for them to recover and 44 (98%) felt ready for their procedure on the day.

Other comments:

The questionnaire ended with “Do you have any other comments about the information you were given that could be improved?” Seventeen of the 80 patients discussed the resources given to them here. Fifteen of these patients made reference to electronic resources, suggesting improved access to videos, exercises and online timelines, with all of this in one place, potentially using an app to refer to instead of paper leaflets. One suggested using E-learning modules for patients, another suggested using blogs to inform patients of the process and another ended with the phrase “get into the digital age”, highlighting the frustration with paper. Six patients mentioned delays before being diagnosed and treated. A further patient admitted to not remembering much after the anaesthetic and was confused, pertaining to recovery and exercises, at home.

Discussion

The primary aim of this project was to evaluate patients’ satisfaction with the information received during their operative experience. In general, patients were satisfied with the information and care they received. Some resources were found more useful than others and leaflets appear to no longer meet all the needs of the patient population. Very few patients received or viewed webpages pertaining their procedure, but it was clear that many patients would value this. Speaking to other people who have undergone the same operation had a variable impact, with some individuals finding it useful and others less so. Patients have reported that they want more specific and succinct information that applies to them and the procedure they are undertaking. Information was requested on the topics of post-operative pain, recovery, the procedure and who would be in theatre with them. Ideally, they would like electronic resources that they can refer to throughout their recovery period.

Resources

The majority of pre-operative patients would have liked a one to one with patients who have had the same operation previously. However, patients suggested that such exposure came with downsides, including negatives being overplayed, which was unhelpful. Patients undergoing reparative procedures found patient exposure more useful. This could be due to the subjective results of replacement therapy outcomes or over reporting of negative post-op occurrences, such as pain and initially reduced functional outcomes. Patients requested access to regulated and realistic patient experiences, which could take the form of a blog or vlog (video blog). With YouTube being used already for recovery ideas, videos appear to be a positive way of informing patients. Blogging has been demonstrated to be effective in teaching
professionals although its effect on patient education has not been explored adequately yet.\(^{20}\) It may, however, be a good way to manage and influence patients’ expectations.

The study population also requested more use of the internet, specifically asking for webpages about their procedures, online recovery timelines and a method of leaving questions for the surgeons to respond to in due course. A systematic review has evaluated the effectiveness of web based resources in orthopaedic patients and showed that they can improve both the knowledge of patients and satisfaction with their surgery but should not be used in place of interactions with healthcare providers.\(^{21}\) Another study suggested that all patients be directed to online resources, which would augment their knowledge and improve their informed status when consenting for procedures.\(^{22}\) This suggests it may be worth investing in E-resources to engage patients more.

Interestingly, due to the standardisation of procedures, patients undergoing replacement operations received the most literature and support from physios and other healthcare professionals but were less satisfied than the HTO patients, who do not receive any leaflets at present (one is in development) or group sessions at all. One reason behind this could be bias from the surgeons, who spend more time and are more enthusiastic about these procedures as they are more challenging and “interesting”. By spending more time with the patient, you could subconsciously improve the patient’s perception of their care and ensure more accurate post-operative expectations. This may achieve higher satisfaction scores than more routine operations, a point that has been proposed in the literature previously.\(^{10,11}\)

The variability of the results could demonstrate that patients have differing values, highlighting that patients may wish be treated differently in order to identify and address their varied needs, similar to previous literature.\(^{23}\) Resources must be of high quality and pitched at the right health literacy level.\(^{24}\) This evaluation also showed that patients need different resources pre and post-operatively, similar to another which identified that tailored patient information, pain management and the use of other mediums such as social media and the internet may be useful in improving patients’ understanding of procedures and recovery.\(^{25}\) This mirrored another study pertaining lung cancer surgery patients.\(^{26}\)

Although the majority of current literature has not evaluated patient satisfaction of information, a previous study suggested NHS provide varied and conflicting literature to patients, which does not have a standard readability score, concluding that patient involvement in the designing of resources is important.\(^{27}\) Moreover, the resources given to patients should be accurate and of high quality.\(^{28}\) By giving information packs, in advanced of procedures, surgeons could offer consolidated, pre-organised information for the patient to assimilate more easily and allow for a more informed decision making process.\(^{29,30}\)

**Information topics**

Common additional information requests reflect previous studies, with some identifying that patients want more information on activity levels post-operatively.\(^{23}\) This is a common theme in literature, with another study suggesting the literature that patients receive around post-op pain management, such as
weaning off medication and misconceptions around disturbing side-effects, is lacking.\textsuperscript{(25)} Another frequently missed topic of patient concern was returning to work, which was a requested topic in our population.\textsuperscript{(27)} Others want more information on how to cope at home.\textsuperscript{(31)} Although there is a core set of topics that patients are requesting more information on, literature suggests that patients hold different priorities and a medium best suiting to addressing multiple questions has not yet been found.\textsuperscript{(23)} Solutions could take the form of a “Frequently Asked Questions” section on a website, whereby patients could seek out the answers to questions they hold individually.

This evaluation further demonstrated that patients receive conflicting or repeated information. Key pieces of information about a patient’s recovery are often given directly after they have been aroused from anaesthesia.\textsuperscript{(27)} This poses problems as patients memory function is impaired directly after surgery, during which time important recovery instructions are delivered.\textsuperscript{(32)} By delaying information provision until right before the patient is discharged, or at least 40 minutes after waking up from anaesthetic, retention could be drastically improved.\textsuperscript{(32)}

\textbf{Patient involvement}

Post-operative patients were statistically more likely to be dissatisfied with the information and care they had received than post-operative patients. Although there is no literature suggesting why this might be, it could be because patients are unsure what they want (information wise) before their operations, or that we do not include what they would have found useful in the resources we give to them. Equally, most patients were questioned in the three to six week window post-operatively, the period in which patients have the most pain without noticeable functional benefit. A recurring theme throughout previous literature is the importance of engaging patients in the production of resources, but this is something rarely done in clinical practice.\textsuperscript{(23, 27, 30)} A review around this topic suggested that patients’ coping strategies are all different and employing needs based information provision, where patients are asked what information they might like to receive prior to a consultation, would enhance satisfaction and reduce pre-surgical anxiety.\textsuperscript{(33)} An implication of this finding is that patients should actively be involved in designing materials for other patients, at least in the drafting phase. This should also be a continual evaluative process, whereby patients are asked to evaluate their functional outcomes as well information they received routinely. This could ultimately improve patient readiness, outcomes and satisfaction with the service provided.

\textbf{Strengths & Weaknesses}

Strengths of this project included the addition of free-text answers in the questionnaire so patients could reflect on what they felt was important for us to know. The project also evaluated a range of surgeons, evaluating the majority of the service. Limitations include the sample population size being relatively small and not ensuring that all patients answered the same questions. Additionally, there was not an equal distribution of procedure types and ages, meaning some groups may be under- or over-represented. Post-operative patients were interviewed up to a year after their operation, meaning that some had forgotten about the specifics of their procedure, potentially enabling recall bias. Finally, the same patients
were not interviewed before and after their procedures. This means that comparison between post and pre-operative patients should be interpreted with caution, although having a variety of patients allows more voices to be heard throughout the process.

**Conclusion**

In general, patients were satisfied with the information and care they received but not all elements of the information were found useful. This could be improved by the production of webpages that include educational videos, patient experiences and an interactive recovery timeline, or a mobile information portal platform that is tailored to each procedure and has the ability to ask healthcare professionals questions, as they recover. Patient involvement in the development and delivery of resources would be worthwhile and would enhance the resources developed. These suggestions may enable NHS Trusts to “get into the digital age”, however, more research on patient satisfaction around information provision and the impact it has on recovery as well as decision making is needed.

**Abbreviations**

ACLR
Anterior Cruciate Ligament Repair
HTO
High Tibial Osteotomy
PRO
Patient Reported Outcomes
THR
Total Hip Replacement
TKR
Total Knee Replacement

**Declarations**

**Ethics approval and consent to participate:**

This project required and received ethical approval by Warwick University’s Biomedical & Scientific Research Ethics Committee, reference number: BSREC-CDA-SSC2-2019-39, as well as registration with the Research and Development department at University Hospitals Coventry & Warwickshire, reference: SE0189. Informed consent was gained from the patients, each patient received a patient information leaflet and had the opportunity to opt-out prior to data submission.

**Consent for publication:**

Not applicable
Availability of data and material:
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests:
None to declare

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Author contributorship:
MR designed the study and questionnaire, collected the data and produced the first draft. AM provided the patient cohorts within the trust, modifying the questionnaire and re-drafting the manuscript. DE assisted in drafting the questionnaire and providing statistical advice as well as drafting the methods section. DD helps in arriving at the correct research question adding to the questionnaire and developing the analysis. All authors have read and approved the manuscript.

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Figures

![Figure 1](image_url)

**Figure 1**

Received vs requested methods of receiving information for post-operative patients (n = 45)

**Supplementary Files**

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