


Why Do People Undergo THR and What Do They Expect to Gain—A Comparison of the Views of Patients and Health Care Professionals

Journal of Patient Experience
2020, Vol. 7(6) 1778-1787
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2374373520956735
journals.sagepub.com/home/jpx


Shayan Bahadori, BEng(Hons), MSc¹ , Sarah Collard, BA, MSc, PhD², Jonathan Mark Williams, BSc (Hons), PGCertEd, PhD², and Ian Swain, BSc(Hons), PhD C.Eng FIET C.Sci FIPEM¹

Abstract

Little concerted effort has been made to understand why individuals undergo total hip replacement (THR) surgery and their rehabilitation goals. Similarly, insight of views and perspective of health care professionals' (HCPs) regarding surgery and what objective measures help them with decision-making is lacking. This patient and public involvement report aimed to explore both patients' and HCPs' perspectives of THR surgery. Twenty patients, 10 pre-THR, 10 post-THR, 9 physiotherapists, and 6 surgeons took part. Results suggest a consensus among patients and HCPs on pain reduction being the main reason for undergoing THR. The inability to carry out simple daily activities such as dog walking and sleep deprivation had a significant effect on patients' mental and physical well-being. This article is the first to explore the views of THR patients and HCPs on reasons behind THR surgery amalgamated into a single report. As walking is important, wearable activity monitors are suggested as a possible motivator to enhance patient compliance to self-care rehabilitation and increase quality of life. A future research project on the use of such wearable activity monitors in enhancing mobility post-THR is therefore planned.

Keywords

patient and public involvement, patient experience, health care professionals, total hip replacement

Introduction

Patient and public involvement (PPI) in research has expanded rapidly, both nationally and internationally, with the aim of improving all aspects of the research process from commissioning to dissemination and evaluation (1). A PPI approach is recommended where researchers collaborate with the patient and/or public to help plan research projects, particularly where the focus is “new” knowledge about the lived experience (2,3). The aim of this article is to explore both patients' and HCPs' perspectives of THR surgery and the potential use of a simple, commercially available activity monitors in rehabilitation by advocating a PPI approach.

Theoretical Underpinnings

Total hip replacement (THR) is an effective treatment for most individuals who suffer from pain and loss of function due to end-stage symptomatic osteoarthritis (OA) of the hip (4). By 2030, the incidence of THR for OA is predicted to

rise by 208% in Australia (2) and 174% in the United States (5). Studies from the United Kingdom, Canada, Taiwan, and Denmark also predict increases in hip replacement surgery, although estimates vary widely (6–9). Eighty percent of those affected by hip OA report some degree of functional limitation and 25% cannot perform routine daily living activities such as getting dressed (10). The prevalence of hip OA is set to rise, along with its economic burden, both from high direct and indirect costs (11).

¹ Orthopaedic Research Institute, Bournemouth University, Bournemouth, Dorset, United Kingdom

² Faculty of Health and Social Sciences, Bournemouth University, Bournemouth, Dorset, United Kingdom

Corresponding Author:

Shayan Bahadori, Orthopaedic Research Institute, Bournemouth University, Bournemouth, Dorset, United Kingdom.
Email: sbahadori@bournemouth.ac.uk



In 2016, the typical hip replacement patient in the United Kingdom was 69.8 years old (female) or 67.6 years old (male), and had a body mass index of 28.8 (12). Few studies have used PPI to explore a patient's decision to undergo THR (13,14). Dosanjh et al (13) conducted interviews with patients regarding their decision to undergo hip replacement, concluding that decisions to undergo surgery were based upon increasing severity of limitations affecting their basic quality of daily living, relationships, and psychological well-being (13).

Efforts to aid decision-making have centered on clinicians providing information to patients to make trade-offs between costs and benefits. Recent qualitative studies (15,16) have explored patients' unwillingness to consider total joint replacement (TJR) surgery due to negative pre-surgery perceptions. These studies highlighted the lack of patient knowledge and how discussions about TJR might be initiated (and by whom) as a major influence on patient unwillingness to consider TJR surgery (15,16).

Perspectives of orthopedic surgeons on patients' appropriateness for TJR have also been a subject of interest (17). In a qualitative study, surgeons were asked (1) what their criteria is for TJR; (2) do they use support tools to assess appropriateness for surgery; and (3) what role the patient plays in their decision-making (17). Surgeons agreed that pain and its impact on quality of life is key to determine appropriateness, however they also agreed that these concepts are complex, multifactorial, and do not always correlate with joint radiographs (17). Some surgeons used a wider range of criteria, including assessments of patient expectations, ability to cope, and readiness for surgery (17). While age was not a factor for decision-making, surgeons acknowledged that criteria may differ between younger and older patients (17). Most also agreed that there is a need for an appropriate decision-making tool, albeit that the final decision will always be based upon surgeons' discretion within the context of the doctor-patient relationship (17).

Concepts and Theory Development

Patient-reported outcome measures (PROMs) have been introduced by national health systems and quality networks to ensure clinical standards and to supervise outcome after THR (18). Despite concerns over standardization (19), studies have shown an association between presurgical values and postoperative outcomes (20–22). However, discrepancies between PROMs and performance-based function are seen (23) and a number of studies have suggested caution when only using subjective data as the measure of recovery (23–25). Additionally, compared with preoperative function, postoperative activity levels are low and many individuals become socially isolated following surgery (26,27). Specht et al (28) explored the experience of individual undergoing THR during 12 weeks postdischarge from hospital. They found that there was a feeling of uncertainty among THR

patients at being left on their own after discharge, which affected their self-management and recovery at home (28).

A paradigm shift in the management of patients pre- and postsurgery toward self-management has been advocated to improve patient surgical pathways (29). Thewlis et al (29) objectively measured 24-hour activity profiles (ie, walking activities and sleep) before and after THR, using a wrist-worn accelerometer (29). They found patients were inactive and slept poorly prior to THR and showed no improvement in 24-hour activity profiles 6 months postoperation. Commercial activity trackers and smartphone apps have been explored for monitoring and enhancing physical activity following surgery (30–34). However, very little evidence was found to support long-term efficacy of the technology in enhancing quality of life and patient monitoring post-THR (35).

Aim

Overall, there is a lack of evidence surrounding an individuals' pre and post-THR views and perspectives (36). No concerted effort has been made to advocate partnership with individuals undergoing THR to understand their reasons for undertaking surgery and their ultimate rehabilitation goals. Similarly, insight is lacking on the views of HCPs, such as surgeons and physiotherapists, to understand their perspectives on surgery and what objective measures will assist with decision-making. The aim of this article is to obtain HCPs' and patients' perspectives of THR surgery and the use of simple commercially available activity monitor in rehabilitation by advocating a PPI approach.

Methods

This article is reported with reference to the Guidance for Reporting Involvement of Patients and the Public (37) checklist.

Engagement Strategy and Individuals Involved

With a focus on digital technologies, it was decided to publish the "invitation to get involve" advert through a social media platform (Twitter). The lead author had Twitter followers, including local hospitals, local universities, NIHR INVOLVE, Chartered Society of Physiotherapy, British Orthopaedic Association, and International PPI and therefore reached a large number of patients, surgeons, and physiotherapists across a wide geographical area. An online approach was taken to recruit those who already use smartphone apps in their daily routine to minimize the gap between digital technology and the typical demography of those having received THR (over 65 years old). Moreover, there is evidence to support an increase in orthopedic patients (38), orthopedic surgeons (39), and physiotherapists (40) using social media. A topic guide, informed by previous literature (28) and

Before Surgery Patients

Age:

Gender:

Roughly how long you have had the hip pain:

1. In regards to your physical activity, what sort of things did you do prior to your hip arthritis?
2. What are your top three limitations?
3. How do you cope with these limitations?
4. Have you had professional help to manage these limitations (i.e. are you seeing a physiotherapist or others)? If so what have they suggested?
5. Are you or would you consider hip replacement surgery?
6. What do you hope that surgery will accomplish for you?
7. Would you like to be more active? How?
8. Do you have or use a smartphone or a mobile phone?
9. Have you owned an activity monitor or know anyone who owns one? If no, would you consider one to help you get more active? If yes, How do you find using one?
10. Any other comments:

Figure 1. Topic guide example—before total hip replacement group.

designed by the project team, was used to explore each group's thoughts on surgical and recovery pathways and their perspectives on the use of a simple commercially available activity monitor in rehabilitation (patients) and diagnosis (surgeons and physiotherapist). Figures 1–4 detail an example of topic guide questions.

Inclusion and Exclusion Criteria

The post-THR group included individuals who had undergone one or both hip replacements within a year. A year was chosen to represent the time frame to recovery post-THR. The group yet to receive THR included those who were diagnosed with symptomatic arthritis and were on the hospital list to have operation within a year. The surgeons group included were orthopedic specialists with over 5 years of experience and having performed at least 200 cases of THR surgery. The physiotherapist group included those who had over 2 years of experience working with patients within an orthopedic setting.

Results

Demographics

A total of 35 people were invited to take part in the PPI groups. Depending on participant preference, location, and availability, the lead author conducted face-to-face ($n = 15$) and telephone ($n = 20$) discussions lasting between 25 and 35 minutes with each individual group member between 4th and 30th of August 2019. Notes about the interactive discussion were made during the conversation by the lead author and subsequently transcribed. Demography and relevant information of all group members are summarized in Table 1.

Outcomes of PPI

The core concepts that emerged for each of the PPI groups are summarized below.

The views of individual yet to undergo THR ($n = 10$)

Physical activity. Seven group members reported pain was the trigger to decrease physical activity. The majority of the

Post Surgery Patients

Age:

Gender:

Date of surgery:

1. In regards to your physical activity, what sort of things did you do prior to your hip arthritis?
2. What weren't you able to do after your hip arthritis worsened?
3. What were your top three limitations?
4. How did you cope with these limitations?
5. What factors led to your decision to consider the option of hip replacement?
6. What has surgery changed for you?
7. Have you been able to accomplish your goals post-surgery?
8. Do you feel more active? Would you like to be more active? How?
9. Do you have or use a smartphone or a mobile phone?
10. Have you owned an activity monitor or know anyone who owns one? If no, would you consider one to help you get more active? if yes, How do you find using one?
11. What would you change (if any) from your rehabilitation journey?
12. Any other comments:

Figure 2. Topic guide example—after total hip replacement group.

individuals (8 members) lived an active lifestyle which involved walking, carrying out professional/family-related activities, and sport.

Limitations and goals. Individuals had a strong sense of wishing to “help themselves” in the early stages of hip pain, but at the point of formal diagnosis, most could not carry out simple daily activities which required bending (ie, wearing socks), were unable to walk for long periods of time, and felt their sleep was affected. Anti-inflammatory painkillers were a common solution to managing the pain. Prior to undergoing THR, patients were treated with physiotherapy, hip block injections (a combination of a synthetic steroid and a local anesthetic), and a cycling program. Individuals particularly sought out THR with the goal to return to walking, become active, and generally get their “normal life back.”

Activity monitors. All participants, except 2, currently use a smartphone, 4 people had wearable activity monitors, and 1 used a smartphone activity monitor app. There was agreement

that they were unsure of safe levels of activity. Individuals wanted to know what they could do to help themselves and, in particular, what simple task they could carry out before the THR operation to serve as prehabilitation.

Views of individuals after their THR (n = 10)

Physical activity. All group members were active individuals with the top 3 activities including walking, swimming, and playing golf. However, as their symptomatic hip arthritis worsened, their activities were reduced significantly. Their inability to carry out simple activities such as dog walking, moving around the house, and even engaging in sexual activities were affecting mental and physical well-being. The increasing restrictions upon their life were a main factor for them considering THR surgery.

Limitations and goals. The top 3 reported limitations were pain, the inability to walk, and lack of quality sleep. All group members had to compensate by stopping some of their activities or cope with the pain by taking anti-inflammatory

Orthopaedic Physiotherapists

Job Title:

Number of years working as a physiotherapist:

1. When do you see patients after surgery?
2. What *percentage* of patients would you say attend pre-surgery physiotherapy clinic?
3. What is the initial assessment you carry out in the first clinic post-surgery?
4. What are the questions you tend to ask post-surgery?
5. How often do you see the patients and for how long?
6. Is there a common approach/check list to assess patient's rehabilitation pathway?
7. Do you encourage self-care? What are your recommendations?
8. What is an ideal yet simplest activity that you would recommend to your patients? Are they something we can measure with simple activity monitor (think Fitbit, Garmin etc.)?
9. Do you change your post-surgical rehabilitation to fit individual's goals? If so what are they?
10. Any other comments:

Figure 3. Topic guide example—physiotherapists group.

painkillers. However, for 9 group members, surgery was a revelation in terms of pain free movement, returning to work, being able to walk again, and regaining some level of normalcy. Three members still experienced some pain a year after their THR, but 6 said that they had fully accomplished their presurgery goal of mainly pain-free movement. All group members agreed that, a year after surgery, they are more active compared to the year before surgery, yet they would like to progress from “*pain free*” to “*do more*.” This “do more” phrase referred to activities such as playing tennis, playing golf regularly, going hiking, and power walking.

Activity monitors. All group members, except 1, currently use smartphones. Three used an activity tracker for cycling and running prior to their operation. In general, they were not adverse to having an activity monitor but they felt there were limited opportunities to ask health professionals about what level of activity they are allowed to engage in, with 1 participant feeling that at times they were “*fobbed off*.” Having a personalized rehabilitation program was the only thing they would change from their rehabilitation pathway.

Views of orthopedic surgeons ($n = 6$)

Patient demography. All surgeons described the most common demographic of those who attend their clinic as females

aged 65 to 80 years. All surgeons identified pain as the most common complaint from the patients, followed by loss of mobility and sleep deprivation.

Surgeons' approach and decision-making. All surgeons mentioned carrying out a physical assessment, in particular the Trendelenburg test (41), during their patient's visit to clinic. Surgeons expressed the opinion that as pain was difficult to measure and assess, pain scores needed to correspond with significant radiographic abnormalities. Similarly, a poor radiographic result was not deemed as the ultimate decision-maker, unless significant pain and limitations were being expressed. One surgeon expressed the decision-making as: *It is a 'joint' decision between the patient and I. It's a journey we embark upon together. There is no single factor, but a culmination of a sensible discussion with the patient based on understanding the risk/benefit and the options available.*

Furthermore, quality of life was mentioned by all surgeons but was interpreted differently. Three surgeons expressed it as performance of activities of daily living, while the other 3 surgeons included additional considerations, such as hobbies/sport.

Preoperative and postoperative service. None of the surgeons who took part in our group have a routine

Total Hip Replacement Surgeons

Job Title:

Number of years working in Orthopaedics:

Number of hip replacements:

Assisted:

Performed:

1. Could you please describe the most common demographic of the individuals who attend your clinic?
2. What are the most common complaints that you hear from patient?
3. Do you test patients in your clinic? If so how?
4. What are the factors most important to you when it comes to making a decision on whether or not an individual needs a THR surgery?
5. Do you have pre-surgery programme for your patients? If so what are they?
6. When do you see your patients after surgery (follow up clinic time-scale)?
7. Do you perform any tests in the follow up clinic? If so what test?
8. What is an ideal yet simplest activity that you would recommend to your patients? Are they something we can measure with simple activity monitor?
9. Is digital rehabilitation (e.g. apps or wearable's etc...) something that you would consider in your future patient pathways?
10. Any other comments:

Figure 4. Topic guide example—orthopedic surgeons group.

preoperative program for patients. One surgeon said he recommends weight loss and hip friendly exercises such as cycling, yoga, or walking. Five surgeons see the patients up to 6 weeks postsurgery in which they prominently focus on checking the wound for infection. One surgeon does not see his patients until 3 months postsurgery. Three surgeons said that they do a physical examination, such as watching patients walk.

Activity monitor. Because of difficulties quantifying patients' pain, surgeons tended to focus on the impact of pain on patient mobility or sleep. All surgeons agreed walking was a measurable activity which can be quantified with a simple activity monitor. Surgeons also recognized the benefit that simple activity monitors could have on improving

patient engagement, reassurance, and motivation. Moreover, they expressed their interest in using technology to monitor patients postoperatively.

The views of orthopedic physiotherapists (n = 9)

Preoperative management. Physiotherapists agreed that preoperative physiotherapy is not a usual pathway in the health care system and 6 said only 10% to 30% attended preoperative sessions. They also agreed that those sessions are normally around THR education and expectation during discharge.

Postoperative management. Postoperative management usually starts 1 day postsurgery for the patients. This normally takes around 30 minutes and involves review of the

Table I. Demography and Relevant Information of all Group Members.

Group	Gender	Age	Date of surgery	Suffering from hip pain	Job title	Years in orthopedic	THR performed
After total hip replacement (THR) surgery	Female	81	May 2018				
	Female	61	Feb 2018				
	Female	71	Sep 2018				
	Male	66	Nov 2018				
	Male	74	Mar 2018				
	Male	44	Jul 2018				
	Male	69	Jan 2018				
	Male	69	Nov 2017				
	Male	70	Nov 2018				
Before total hip replacement (THR) surgery	Male	79	Nov 2018				
	Female	59		3 Years			
	Female	57		4 Years			
	Female	51		2 Years			
	Female	55		3 Years			
	Female	45		3 Years			
	Male	66		2.5 Years			
	Male	71		4 Years			
	Male	64		1 Year			
Surgeon	Male	61		2 Years			
	Male				Consultant orthopedic surgeon	>10	>600
	Male				Hip fellow	10	453
	Male				Consultant orthopedic surgeon	10	800
	Male				Consultant orthopedic surgeon	16	823
Physiotherapist	Male				Hip fellow	8	260
	Male				Consultant orthopedic surgeon	15	400
	Female				Senior orthopedic physiotherapist	8	
	Female				MSK/orthopedic physiotherapist	2	
	Female				Senior physiotherapist	11	
	Female				MSK/orthopedic physiotherapist	2	
	Female				Senior orthopedic physiotherapist	16	
	Female				Junior orthopedic physiotherapist	6	
	Female				Senior orthopedic physiotherapist	40	
Male				Senior orthopedic physiotherapist	22		
Male				Senior orthopedic physiotherapist	15		

Abbreviation: MSK, musculoskeletal.

operation notes, checking for infections, checking for signs and symptoms of blood clots in the leg, and carrying out basic functional assessment. Functional assessment includes gait and range of joint movement. Two members said that they discuss long-term goals and expectations with their patients at this point.

A further postoperative session is arranged from days 10 to 14. This session is a more comprehensive discussion to understanding an individuals' goals. Understanding pain levels, sleep deprivation, functional restrictions and precautions, short-term goals, long-term goals, and realistic expectations of physiotherapy is sought. A follow-up session is set up for weeks 5 to 6. Only 1 physiotherapist had a protocol, modified Iowa (42), for the follow-up sessions. All physiotherapists agreed that the current system only enables 10 to 30 minutes with each patient per visit, which they consider is insufficient and therefore there is a great reliance on patients' self-care and home exercises.

Activity recommendations and monitoring. A common recommendation from physiotherapists to patients is to “*get active, stay active and exercise regularly but always listen to your body*”, “*listen to your body*,” refers to hip pain, as pain is to be expected if patients have “exceeded” their exercises. All members agreed that walking is the best exercise to recommend. All members also agreed that activity monitors are very effective in self-management, facilitating compliance to home exercises.

Discussion

Outcomes

This is the first PPI report to explore THR patients' and HCPs' perceptions about THR surgery as well as the use of activity monitors as a tool for surgical decision-making and rehabilitation. The findings from this PPI report indicate an overall recognition of the importance of physical activity

and that engagement in activity can be greatly improved by the use of activity monitors. In the absence of pain postsurgery, patients described their wish “to do more” to achieve personal enjoyment. These findings are in line with the study by Harding et al (43), which also recognizes individual beliefs and perceptions as important influencers to THR recovery and they should be given a high level of priority by HCPs when developing rehabilitation plans.

Shared decision-making is increasingly presented as the preferred model for patient care (44,45). However, HCP members suggested that the current health care setting makes this difficult, mainly due to lack of consultation time suggesting that service constraints drive clinical decision-making. In association with lack of preoperative programs from HCPs, patients are normally left with a level of psychological distress (45). It is important to recognize that patients want to help themselves, and a simple activity such as walking could enable them to feel involved and encourage compliance in home care rehabilitation (46).

All HCP members agreed that activity monitors could positively complement their role and enhance their relationship with patients. Perceived benefits of activity monitors included monitoring patients’ progress, treatment evaluation, monitoring compliance, and informing clinical decision-making. Objective data on a simple activity such as walking could be used alongside PROMs to achieve goals and allow patients to take ownership of their treatment.

Impact

The impact of PPI can be divided into several categories. Firstly, partnership with THR patients and HCPs to understand their perspective is established for the first time in a single report. Secondly, it is now understood that the main reason for undergoing THR surgery is relief of pain and desire to gain normal life activities. Thirdly, there is need for an objective tool to facilitate clinical decisions between HCPs and patients. Walking ability was recognized as a factor that would assist in better understanding patients’ expectations and standardizing indications for surgery and rehabilitation. Fourthly, improving patient compliance and creating a patient centered program can be a positive intervention on the THR surgical pathway and the use of a simple activity monitor may be the path forward.

Reflections/Critical Perspective

There are limitations to this PPI report. The PPI group was recruited online and therefore responses in regard to the use of activity monitor are subject to bias. Nonetheless, recruiting online meant that group members were not limited. In order to achieve a broader generalization, in particular with patient groups, the findings may require more participants. Nevertheless, this report opens previously unexplored issues that could help develop new studies for THR patients.

Conclusion

This article is the first to explore the views of THR patients and HCPs on reasons behind THR surgery in a single report. As walking is important, wearable activity monitors have been suggested as a possible motivator to enhance patient compliance to self-care rehabilitation and increase chance of long-term quality of life. A future research project on the use of such wearable activity monitors in enhancing mobility post-THR is therefore planned.

Authors’ Note

As this article utilized an approach in line with governance procedures on PPI, the Health Research Authority (HRA) ethics database (47) confirmed ethics approval was not required and therefore was not sought.


Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Shayan Bahadori  <https://orcid.org/0000-0003-0201-9840>

References

1. National Institute for Health Research. Patient and Public Involvement in Health and Social Care Research: A Handbook for Researchers. National Institute for Health Research; 2014.
2. Staley K. ‘Is it worth doing?’ Measuring the impact of patient and public involvement in research. *Res Involve Engage*. 2015; 1:6. doi:10.1186/s40900-015-0008-5
3. Doria N, Condran B, Boulos L, Donna GCM, Laura D, Adrian L. Sharpening the focus: differentiating between focus groups for patient engagement vs. qualitative research. *Res Involve Engage*. 2018;4:19. doi:10.1186/s40900-018-0102-6
4. Kehlet H. Fast-track hip and knee arthroplasty. *Lancet (London, England)*. 2013;381:1600-2. doi:10.1016/s0140-6736(13)61003-x
5. Kurtz S, Ong K, Lau E, Fionna M, Michael H. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am*. 2007;89: 780-85. doi:10.2106/jbjs.f.00222
6. Kumar A, Tsai WC, Tan TS, Pei-Tseng K, Li-Ting C, Ming-Chou K. Temporal trends in primary and revision total knee and hip replacement in Taiwan. *J Chin Med Assoc*. 2015;78: 538-44. doi:10.1016/j.jcma.2015.06.005
7. Sharif B, Kopec J, Bansback N, Rahman MM, Flanagan WM, Wong H, et al. Projecting the direct cost burden of osteoarthritis in Canada using a microsimulation model. *Osteoarth Cartil*. 2015;23:1654-63. doi:10.1016/j.joca.2015.05.029
8. Culliford D, Maskell J, Judge A, Cooper C, Prieto-Alhambra D, Arden NK, et al. Future projections of total hip and knee arthroplasty in the UK: results from the UK clinical practice

- research datalink. *Osteoarth Cartil.* 2015;23:594-600. doi:10.1016/j.joca.2014.12.022
9. Pedersen AB, Johnsen SP, Overgaard S, Kjeld S, Henrik TS, Ulf L. Total hip arthroplasty in Denmark: incidence of primary operations and revisions during 1996-2002 and estimated future demands. *Acta Ortho.* 2005;76:182-89. doi:10.1080/00016470510030553
 10. World Health Organization. *The Burden of Musculoskeletal Conditions at the Start of the New Millennium: Report of a WHO Scientific Group.* World Health Organization; 2003.
 11. Chen A, Gupte C, Akhtar K, Smith P, Cobb J. The global economic cost of osteoarthritis: how the UK compares. *Arthritis.* 2012;2012:6. doi:10.1155/2012/698709
 12. Evans JT, Evans JP, Walker RW, Ashley WB, Michael RW, Adrian S. How long does a hip replacement last? A systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up. *Lancet.* 2019;393:647-54. doi:10.1016/S0140-6736(18)31665-9
 13. Dosanjh S, Matta JM, Bhandari M. The final straw: a qualitative study to explore patient decisions to undergo total hip arthroplasty. *Arch Ortho Trauma Surg.* 2009;129:719-27. doi:10.1007/s00402-008-0671-1
 14. Llewellyn-Thomas HA, Arshinoff R, Bell M, Williams JL, Naylor CD. In the queue for total joint replacement: patients' perspectives on waiting times. Ontario hip and knee replacement project team. *J Eval Clin Pract.* 1998;4:63-74.
 15. Clark JP, Hudak PL, Hawker GA, Coyte PC, Nizar NM, Hans JK, et al. The moving target: a qualitative study of elderly patients' decision-making regarding total joint replacement surgery. *J Bone Joint Surg Am.* 2004;86:1366-74.
 16. Hudak PL, Clark JP, Hawker GA, Peter CC, Nizar NM, Hans JK, et al. "You're perfect for the procedure! why don't you want it?" elderly arthritis patients' unwillingness to consider total joint arthroplasty surgery: a qualitative study. *Med Decis Making.* 2002;22:272-78. doi:10.1177/0272989x0202200315
 17. Frankel L, Sanmartin C, Hawker G, De Coster C, Michael D, Eric B, et al. Perspectives of orthopaedic surgeons on patients' appropriateness for total joint arthroplasty: a qualitative study. *J Eval Clin Prac.* 2016;22:164-70. doi:10.1111/jep.12449
 18. Dawson J, Doll H, Fitzpatrick R, Crispin J, Andrew JC. The routine use of patient reported outcome measures in healthcare settings. *BMJ.* 2010;340:c186.
 19. Siljander MP, McQuivey KS, Fahs AM, Lisa AG, Kevin JS, Mark SK. Current trends in patient-reported outcome measures in total joint arthroplasty: a study of 4 major orthopaedic journals. *J Arthro.* 2018;33:3416-21. doi:10.1016/j.arth.2018.06.034
 20. Weber M, Craiovan B, Woerner ML, Timo S, Joachim G, Tobias FR. Predictors of outcome after primary total joint replacement. *J Arthro.* 2018;33:431-35.
 21. Ostendorf M, Van Stel H, Buskens E, Schrijvers AJP, Marting LN, Verbout AJ, et al. Patient-reported outcome in total hip replacement: a comparison of five instruments of health status. *Bone Joint J.* 2004;86:801-8.
 22. Weber M, Zeman F, Craiovan B, Max T, Moritz K, Michael W, et al. Predicting outcome after total hip arthroplasty: the role of preoperative patient-reported measures. *BioMed Res Int.* 2019;2019:9. doi:10.1155/2019/4909561
 23. Luna IE, Kehlet H, Peterson B, Wede HR, Hoevsgaard SJ, Aasvang EK. Early patient-reported outcomes versus objective function after total hip and knee arthroplasty: a prospective cohort study. *Bone Joint J.* 2017;99-b:1167-75. doi:10.1302/0301-620x.99b9.bjj-2016-1343.r1
 24. Holl S, Blum A, Gosheger G, Ralf D, Corinna W, Dieter R. Clinical outcome and physical activity measured with step watch 3 activity monitor after minimally invasive total hip arthroplasty. *J Ortho Surg Res.* 2018;13:148. doi:10.1186/s13018-018-0775-4
 25. Bandholm T, Wainwright TW, Kehlet H. Rehabilitation strategies for optimisation of functional recovery after major joint replacement. *J Exp Ortho.* 2018;5:44. doi:10.1186/s40634-018-0156-2
 26. Harding P, Holland AE, Delany C, Rana SH. Do activity levels increase after total hip and knee arthroplasty? *Clin Ortho Relate Res.* 2014;472:1502-11. doi:10.1007/s11999-013-3427-3
 27. Smith T. "On their own": social isolation, loneliness and chronic musculoskeletal pain in older adults. *Qual Ageing Older Adults.* 2017;18:87-92. doi:10.1108/QAOA-03-2017-0010
 28. Specht K, Agerskov H, Kjaersgaard-Andersen P, Rebecca J, Birthe DP. Patients' experiences during the first 12 weeks after discharge in fast-track hip and knee arthroplasty - a qualitative study. *Int J Orthop Trauma Nurs.* 2018;31:13-19. doi:10.1016/j.ijotn.2018.08.002
 29. Thewlis D, Bahl JS, Fraysse F, Curness K, Arnold JB, Taylor M, et al. Objectively measured 24-hour activity profiles before and after total hip arthroplasty. *Bone Joint J.* 2019;101-B:415-25. doi:10.1302/0301-620x.101b4.bjj-2018-1240.r1
 30. Toogood P, Abdel M, Spear J, Cook SM, Cook DJ, Taunton MJ. The monitoring of activity at home after total hip arthroplasty. *Bone Joint J.* 2016;98-B:1450-54. doi:10.1302/0301-620x.98b11.bjj-2016-0194.r1
 31. Van der Walt N, Salmon LJ, Gooden B, Lyons CM, O'Sullivan M, Kaka M, et al. Feedback from activity trackers improves daily step count after knee and hip arthroplasty: a randomized controlled trial. *J Arthro.* 2018;33:3422-28. doi:10.1016/j.arth.2018.06.024.
 32. Wang J, Tong Y, Jiang Y, Hongxia Z, Hui G, Rong W, et al. The effectiveness of extended care based on Internet and home care platform for orthopaedics after hip replacement surgery in China. *J Clin Nurs.* 2018;27:4077-88. doi:10.1111/jocn.14545
 33. Crizer MP, Kazarian GS, Fleischman AN, Jess HL, Mitchell GM, Antonia FC. Stepping toward objective outcomes: a prospective analysis of step count after total joint arthroplasty. *J Arthroplasty.* 2017;32:S162-65. doi:10.1016/j.arth.2017.02.058
 34. Bahadori S, Wainwright TW, Ahmed OH. Readability of information on smartphone apps for total hip replacement and total knee replacement surgery patients. *J Patient Exp.* 2020;7:395-98. doi:10.1177/2374373519844266.

35. Bahadori S, Collard S, Williams J, Ian S. A review of current use of commercial wearable technology and smartphone apps with application in monitoring individuals following total hip replacement surgery. *J Med Eng Technol*. 2020;1-10. doi:10.1080/03091902.2020.1797917
36. Dore-Smith E, Killing back C. What are the postoperative experiences of patients who have undergone hip and knee joint replacement? A literature review. *Phys Ther Rev*. 2018;23:250-58. doi:10.1080/10833196.2018.1482989
37. Staniszewska S, Brett J, Simera I, Seers K, Mockford C, Goodlad S, et al. GRIPP2 reporting checklists: tools to improve reporting of patient and public involvement in research. *BMJ*. 2017;358:j3453. doi:10.1136/bmj.j3453
38. Duymus TM, Karadeniz H, Cacan MA, Baran K, Abdullah D, Sinan Z, et al. Internet and social media usage of orthopaedic patients: a questionnaire-based survey. *World J Ortho*. 2017;8:178-86. doi:10.5312/wjo.v8.i2.178.
39. Curry E, Li X, Nguyen J, Elizabeth M. Prevalence of internet and social media usage in orthopedic surgery. *Ortho Rev*. 2014;6:5483. doi:10.4081/or.2014.5483
40. Chartered Society of Physiotherapy. Social media guidance for CSP members; 2019. Retrieved August 2020, from: https://www.csp.org.uk/system/files/publication_files/csp-social-media-guidance-may-2019-v02.pdf.
41. Hardcastle P, Nade S. The significance of the Trendelenburg test. *J Bone Joint Surg Br*. 1985;67:741-46. doi:10.1302/0301-620x.67b5.4055873
42. Elings J, Zoethout S, Ten Klooster PM, van der Sluis G, van Gaalen SM, Van Meeteren NLU, et al. Advocacy for use of the modified Iowa level of assistance scale for clinical use in patients after hip replacement: an observational study. *Physiotherapy*. 2019;105:108-13. doi:10.1016/j.physio.2018.06.002
43. Harding PA, Holland AE, Hinman RS, Clare D. Physical activity perceptions and beliefs following total hip and knee arthroplasty: a qualitative study. *Physiother Theory Pract*. 2015;31:107-13. doi:10.3109/09593985.2014.959581
44. Kriston L, Scholl I, Hölzel L, Daniela S, Andreas L, Martin H. The 9-item shared decision making questionnaire (SDM-Q-9). Development and psychometric properties in a primary care sample. *Pat Edu Counsel*. 2010;80:94-99. doi:10.1016/j.pec.2009.09.034
45. Driever EM, Stiggebout AM, Brand PLP. Shared decision making: physicians' preferred role, usual role and their perception of its key components. *Patient Educ Couns*. 2020;103:77-82. doi:10.1016/j.pec.2019.08.004
46. Nasr N, Enderby P, Parry A. Redefinition of life experience following total hip replacement: a qualitative study. *Disabil Rehabil*. 2012;34:802-10. doi:10.3109/09638288.2011.620404
47. Medical Research Council. Do I need NHS REC approval? 2019. Retrieved July 2019, from: <http://www.hra-decisiontools.org.uk/ethics/>

Author Biographies

Shayan Bahadori is a biomedical engineer, and is a research project manager at Bournemouth University.

Sarah Collard is a lecturer in psychology at Bournemouth University.

Jonathan Mark Williams is a physiotherapist and is a senior lecturer in physiotherapy at Bournemouth University.

Ian Swain is a professor in technology and design at Bournemouth University.