DANISH MEDICAL JOURNAL

Original Article

Patient-reported outcome measures in orthopaedics

Stine Thestrup Hansen[1, 2], Rasmus Stig Jensen[3], Henriette Appel Holm[4] & Anette Liljensøe[3, 5]

1) Department of Plastic- and Breast Surgery, Zealand University Hospital, Roskilde, 2) Department of Regional Health Research, University of Southern Denmark, 3) Procordo, 4) Research Unit of Orthopaedics, Vejle Hospital, Lillebælt Hospital, 5) Orthopaedic Research Unit, Department of Orthopedic Surgery, Aarhus University Hospital, Denmark

Dan Med J 2024;71(11):A03240193. doi: 10.61409/A03240193

ABSTRACT

INTRODUCTION. The Patient Activity Treatment Outcome Scale (PATOS) is a novel patient-reported outcome measure (PROM). This study explored patients' and orthopaedic surgeons' experiences with PATOS as part of a PROM battery. It aimed to investigate its influence on patient involvement and healthcare decisions about knee or hip osteoarthritis patients scheduled for knee/hip arthroplasty.

METHODS. A qualitative research design was adopted using semi-structured interviews with 19 patients and nine orthopaedic surgeons at a Danish orthopaedic surgery department. Thematic analysis was used to develop key themes from interview transcripts.

RESULTS. This study adds nuanced insights related to the use of PROMs in routine orthopaedic clinical practice. Home-based completion of PROMs prompted patients to reflect on their situations, priorities and goals regarding potential hip or knee arthroplasty, leading to better-prepared discussions with surgeons. The integration of PATOS with other PROMs made it challenging to discuss PATOS exclusively. Therefore, the results relate to the full PROM battery. The experiences of patients and surgeons were organised into four themes: 1) Patient involvement is key, 2) Questionnaire load, 3) Meaningful home-based completion and 4) PROMs were not used in the decision-making process.

CONCLUSIONS. The questionnaire load and limited integration into healthcare decision processes raised concerns about the application of the PROM battery. The results emphasise the importance of refining the application of PROMs in orthopaedic practice from the perspectives of patients and surgeons alike.

FUNDING. This work was supported by Innovation Fund Denmark [0172-01258B]

TRIAL REGISTRATION. Not relevant.

In Denmark, there is increasing emphasis on incorporating patient perspectives in health policy through patient-reported outcome measures (PROMs) [1, 2]. Orthopaedic departments spearhead using PROMs to enhance patient care, quality evaluation and research [3, 4]. Patient completion of PROMs and clinician feedback improve communication, care processes, patient involvement [5] and health outcomes [3]. Various PROM tools in orthopaedics primarily support clinical research **[3].**

The Patient Activity Treatment Outcome Scale (PATOS) is a newly developed PROM aiming to advance patient involvement in clinical practice [6]. PATOS was developed for orthopaedic surgery and has potential in planning hip or knee arthroplasty in patients diagnosed with osteoarthritis in the hip or knee (see **Table 1**) [7]. This study aimed to investigate how using PATOS as part of a PROM battery for surgeons (see **Table 2**) influences patient

involvement and healthcare decisions in orthopaedic surgical outpatient settings, specifically for patients considered for hip or knee arthroplasty. In this study, patient involvement was defined as "the relationship between patients and healthcare providers as they work together to promote and support active patient and public involvement in health and healthcare and to strengthen their influence on healthcare decisions" [8, 9]. Henceforth, PROMS refers to the specific PROM battery investigated.

TABLE 1 Facts and considerations about the Patient Activity Treatment Outcome Scale.

Rationale
An essential element of a patient-centred healthcare system is that only the patients themselves can know what they value. Existing PROMs are based on validation by patient groups and do not provide fully individualised value measures for the individual patient's treatment wishes and expectations. To assess whether a treatment fulfils the patient's wishes and expectations, these must be made visible. The rationale for the development of PATOS is a demand from surgeons to develop an individualised PROM with a patient-defined goal regarding the patient's own trajectory in relation to a specific condition, in this case knee or hip osteoarthritis
About PATOS
The hypothesis regarding the use of PATOS in clinical practice is that patients identifying their most important daily activities will enhance their involvement in their treatment. PATOS is a PROM developed for clinical practice, focusing on individual issues. PATOS enables the patient to identify and prioritise specific areas of daily life affected by their current state of health and to explicate possible improvements related to the stated issues after treatment. PATOS focuses on the everyday activities that patients find difficult due to their condition, allowing patients to specify which activities they want the treatment to address PATOS was designed to be completed in 2 steps: The patient identifies and prioritises activities of daily life of importance to the intervention to come The patient indicates how they perceive the ability to perform previously stated activities on a scale of 1-10[a], as well as their pain and discomfort when performing the activities, also assessed on a scale of 1-10[b]
Development and validation
PATOS was developed by clinicians and scholars in Danish language as part of a PROM project conducted at Aalborg University Hospital in 2017 and was subsequently piloted on patients who underwent either knee or hip arthroplasty procedures [6]. The development of PATOS was inspired by literature on the COPM, an interview-based measurement within occupational therapy. PATOS was developed as an electronic questionnaire The validation process comprised the following 3 steps: A total of 24 patients scheduled for knee arthroplasty completed the PATOS and OKS questionnaires prior to surgery at Aalborg University Hospital. These patients were also interviewed using the COPM before the operation. 3 months after surgery, the patients completed the PATOS and OKS questionnaires again, along with anchor questions to determine the minimal clinically important difference Furthermore, 25 patients scheduled for hip arthroplasty completed the PATOS and OHS questionnaires prior to surgery at Aalborg University Hospital. These patients underwent a re-test of the PATOS and OHS questionnaires one week after the initial administration before surgery. Ten of these patients participated in a cognitive debriefing interview. 3 months after surgery, the patients completed the PATOS and OKS questionnaires again, along with anchor questions to determine the minimal clinically important difference A total of 25 patients, who had undergone knee arthroplasty five years earlier and had been interviewed using the COPM before surgery at Gentofte Hospital, completed the PATOS questionnaire. The pilot testing of PATOS demonstrates positive values in the measured psychometric parameters. However, due to the limited patient sample size in this study, further investigations on a larger scale are necessary. PATOS has recently been investigated on a large scale regarding its psychometric properties, quality and reliability. The process and results are pending publication

COPM = Canadian Occupational Performance Measure; OHS = Oxford Hip Score; OKS = Oxford Knee Score; PATOS = Patient Activity Treatment Outcome Scale; PROMs = patient-reported outcome measures.
a) From "cannot perform" to "can perform very well".
b) From "has sincere pain and discomfort" to "has no pain and discomfort".

TABLE 2 The Patient-reported Outcome Measures battery used for patients diagnosed with osteoarthritis in the hip or knee at the orthopaedic departments.

		Items		
Tool	**Objective**	**description**	**scale**	**Reference[a]**
Oxford Knee/Hip Score	Measures pain and function (activities of daily living) related to the knee/hip	12 items, each rated at 5 levels	0-4: severe-none	Murray et al, 2007
EQ-5D-5L	Measures the generic quality of life	Five items with Likert response options and a VAS to rate own health	VAS 0-100: worst-best imaginable health	Reenen et al, 2019
UCLA Activity Scale	Measures physical activity level in patients undergoing hip or knee arthroplasty	A single-item 10-level-scale	Level 10: a highly physically active patient, level 1: a patient who is dependent on others and unable to leave home	Petersen et al, 2021
Forgotten Joint Score	Measures artificial prosthesis awareness during daily activities following total hip arthroplasty	12 items scored on a 0-100 scale	The higher the score, the less the patient is aware of their affected joint when performing daily activities	Thomsen et al, 2016
Pain Catastrophizing Scale	Measures past painful experiences	A 13-item self-report questionnaire with 5-point Likert scale The total score is the sum of the scores for the individual items	0-4: never-always 0-52	Kjøgx et al, 2014
Patient Activity Treatment Outcome Scale[b]	Individual outcome measures	The patient prioritises up to 3 outcomes regarding predefined areas related to their hip or knee osteoarthritis diagnosis: self-care work, duties, hobbies, and pastime The patient rates the prioritised issues with current status plus indication of pain or discomfort on a 10-point Likert scale	1: not important at all 10: extraordinarily important	[11]

EQ-5D-5L = EuroQol, 5 dimensions, 5-level version; VAS = visual analogue scale.
a) Please contact the authors for further information.
b) Initially, PATOS was the abbreviation of Patient-adapted Treatment Outcome Score, as published in [6]. During its development, the tool was renamed to the Patient Activity Treatment Outcome Scale.

Methods

A qualitative research design inspired by Braun and Clarke [10] with semi-structured interviews was adopted to investigate participants' experiences with PATOS. PATOS was created as an electronic PROM to be used in stages. Preoperatively, patients identify daily activity issues related to self-care, work and hobbies (see Table 2). Postoperatively, patients repeat scores at three and six months for outcome evaluation. In December 2021, PATOS was introduced at one orthopaedic surgery department at a public Danish hospital to increase patient involvement and underpin preoperative patient–surgeon discussions and post-operative outcome assessment during consultations at the orthopaedic outpatient clinics [11]. For visual representations of the patient interface and the surgeon interface, see the Supplementary Material. PATOS was introduced as an addition to the departments' existing PROMs in an electronic database that has been used since 2017. This was facilitated by the last author and included an information meeting with the surgeons during which PATOS was presented and demonstrated.

Participants were patients and orthopaedic surgeons purposively sampled [10] from the clinic where PATOS was introduced. The participating patients were diagnosed with knee or hip osteoarthritis and scheduled for either knee or hip arthroplasty at the orthopaedic surgical department. The sample size was determined to generate rigour and nuanced answers to the research question [10]. The first author developed a semi-structured, open-ended interview guide including prompts and probes inspired by Braun and Clarke to explore the aim (Supplementary Material). The guide was reviewed and revised by the author group until a consensus on appropriate contents had been reached. Interviews were conducted 11 months after the introduction of PATOS at the department. All surgeons in the department were informed about the study at a meeting and invited to participate via email. Patients were approached during their scheduled consultations at the department and invited to participate by a clinical nurse. In total, 19 patients and nine surgeons were included in interviews, see **Table 3.** The participants (all male) comprised all the surgeons employed at the department. Five patients declined to participate for lack of time; none dropped out. Interviews were conducted from 16 February 2022 to 17 March 2022. The interviews lasted 8-28 minutes. All interviews were conducted in person by the last author (a

female senior clinical advisor, registered nurse, PhD) with whom none of the participants were acquainted. Interviews were audio-recorded on a digital voice recorder and transcribed verbatim. The participants were anonymised using codes. The first author inductively analysed the interview transcripts using Braun and Clarke's reflexive thematic analysis. This involved familiarisation with data, initial semantic and latent code generation, including interpretation of underlying meanings, theme identification, theme review and definition/naming of themes [12]. The analyses underwent critical revision by the co-authors until a consensus had been reached. NVivo software was used for the analysis, organising data, coding it into themes and extracting citations.

TABLE 3 Characteristics of the participants who were interviewed (N = 28).

	Patients		Surgeons	
	n	mean (range)	n	mean (range)
Gender[a]				
Male	8		9	
Female	11		0	
Age, yrs[b]		71 (53-84)		55 (37-67)
Location of osteoarthritis				
Knee	8			
Hip	11			
PROMs completion[c]				
Home	16			
Hospital	3			

PROMs = patient-reported outcome measures.
a) Information based on participants' information.
b) The age of 1 participant is missing.
c) Information about 1 patient is missing.

The study was reported according to the Consolidated Criteria for Reporting Qualitative Research guideline [13]. Participants provided informed consent, and the study was conducted in compliance with the Declaration of Helsinki [14]. ChatGPT 4 assisted in translating Danish citations into English for **Table 4**. The first author confirmed the accuracy of the intended meaning.

TABLE 4 Citations from patients and surgeons categorized under each of the four themes to support themes.

ID	Citation
Theme 1: Patient involvement is key	
P-ID5	"I felt included in the decision-making process for my knee replacement because the surgeon mentioned that there was no rush to decide immediately. He suggested I could take some time to think it over. My main consideration is that I'll need to make certain compromises. I am passionate about kayaking, mountain biking and keeping fit. I understand that I might not be able to pursue all these activities to the same extent, but I would prefer to be good at a few of them without enduring pain. I believe I have gathered enough information to make an informed choice. The surgeon even gave me a moment to ponder over it. After a few minutes of reflection, I felt confident that undergoing surgery was the right decision"
P-ID7	"I felt engaged in the decision-making process because I had no doubts myself. I would have been extremely disappointed if the surgeon had said the surgery wasn't possible. He listened to my wishes and we came to a mutual agreement that a hip replacement was the best course of action. Overall, I feel that I received excellent care"
P-ID13	"I feel that we thoroughly discussed what mattered most to me. We talked about potential improvements for my knee, addressing the three main challenges I had identified and what he thought could be improved. Additionally, I received information about other patients in similar situations, detailing their experiences and the extent of their improvements. This gave me factual insights based on comparable cases, which I found very helpful. The decision we arrived at was a collaborative one. He didn't pressure me in any way; in fact, it was almost the opposite. I attempted to seek his opinion, but with limited success, as he emphasised, 'It's your choice'. Ultimately, it was up to me to make the final decision"
S-ID26	"In our discussions with patients, we need to determine where we can make a significant impact. It's also about understanding the patient and identifying what's important to them. We can't perform miracles, so it's essential to set realistic expectations. Particularly in my conversations with potential surgery candidates, we quickly assess whether surgery is the appropriate option. During these talks, I focus on the challenges the patient is facing. I typically ask, 'What are your thoughts?' and 'Do you have any questions?' as well as 'What issues are you currently experiencing with your hip?'. They usually describe their specific problems, which often leads to questions like, 'Will I be able to walk longer distances?' or 'Will I experience less pain?' At this stage, it's crucial to align expectations and be cautious about not overpromising"
S-ID27	"I can only schedule a patient for surgery if they consent to it. Although I have the authority to deny their request for surgery if it seems inappropriate, in such instances, it's my responsibility to explain the situation as clearly as possible. This enables them to decide whether they're willing to accept the inherent risks associated with the surgery. While I can't make decisions for them, I can offer advice based on what I would recommend if they were a member of my own family. Consequently, this approach is highly inclusive of the patient, empowering them to make an informed decision with the best available information"
S-ID28	"I consistently prioritise patient involvement as it is a critical aspect of the process. 1 of the first things I do is to ask patients about their expectations for today's examination, which I believe is vital. It's crucial to understand the patient's own expectations regarding both the outcome and the results of a potential operation. Therefore, I dedicate a significant amount of effort to this aspect of patient care"
Theme 2: Questionnaire load	
P-ID1	"I find the questionnaire confusing and believe it could be much simpler with fewer questions. For instance, a question about a scale was asked both on the computer at home and again at the hospital, making me wonder why I needed to answer it twice. This redundancy is frustrating. Take the question about cleaning, for example – What exactly does it refer to? It's enough to say that my performance is hindered because a bad knee affects everything. The survey could be more straightforward, perhaps with a statement like, 'I am hindered in many activities and wish for improvement'. If you're hindered in walking long distances, carrying things, or if you experience knee pain while gardening, it's likely that the pain affects both work and other activities. However, I'm not sure if it's challenging to design a questionnaire that covers everything comprehensively. It would be better to ask about these issues just once instead of repeating them as the repetition makes me uncertain about how to answer"
P-ID5	"While answering the questions, I felt like I was going around in circles, but maybe that process helped in clarifying my priorities, so perhaps it was beneficial in a way. However, at one point, it seemed overly detailed, almost like splitting hairs over whether something took 5 or 10 minutes. I thought the questions were too specific. But if this level of detail is useful for surgeons and researchers, then I suppose it's fine"
P-ID18	"I feel that the questionnaire was overly lengthy. There seemed to be an excessive number of questions, and it just kept expanding with more and more to answer"
S-ID23	"The questionnaire series seems quite extensive, particularly since the addition of PATOS. Many of the questions appear similar, which might not be very patient-friendly as I see it. However, to accurately determine this, it might be beneficial to conduct a more thorough investigation. We could create two sets of questionnaires, have a group of patients respond to them, and then collect their feedback. This would allow us to compare responses, asking questions like 'Do you think the length is excessive?' and evaluate the benefits and value of these additional questions. Another important consideration is the usability of the information we collect. As surgeons, we should ensure that we only ask patients for information that we actually use. Having patients fill in unnecessary information would be a mistake on all fronts. Therefore, it's crucial to determine whether patients find the questionnaires burdensome"
S-ID24	"When patients are required to answer numerous questions, it's crucial to coordinate these questionnaires to avoid having them answer the same questions repeatedly. It's important to be aware of any overlapping content that could be consolidated. Many patients often find it quite difficult to navigate through all these questionnaires"
S-ID25	"Generally, I've observed that patients at [hospital blinded] receive quite a lot of questionnaires. Sometimes, the number of questionnaires can be overwhelming, especially on the day of their appointment, which varies depending on how they're feeling. Filling out these questionnaires can be difficult for patients who have fluctuating good and bad days, and some even lose track completely. From my experience assisting them, I've noticed it's very challenging for them to answer the questions. Therefore, I believe we should aim to simplify the process as much as possible. Reducing the number of questions might be helpful. I think including a question like 'What three things are important to you?' is beneficial for the patient's perspective as we perform operations for their benefit, not ours. In fact, focusing on just that one question might be a good approach, considering that the current excess of questions tends to confuse many patients when they come to the outpatient clinic"
Theme 3: Meaningful home-based completion of questionnaires	
P-ID3	"Some parts of the form were challenging to complete because I couldn't simply tick them off as done. However, I was forced to check them off because there were no other options available. This situation was stressful, especially since my doctor was waiting for me. As I mentioned, I can't recall the specifics, but there were certain items I couldn't answer as required. The form demanded a checkmark, and if I didn't mark it, I was instructed to do so in order to proceed, so I felt compelled to fill it out"
P-ID7	"While completing the questionnaire, I was certain about which three things to prioritise. My reasoning was that if I could manage those activities, I could handle anything. The questions were thought-provoking and required some contemplation. I was relieved that I had completed it from home as this gavew me time to think about my responses"
P-ID12	"I discovered that the questions were beneficial in preparing me for the conversation. Yes, I definitely think so because they prompted me to consider some aspects I had not thought about before. I had the opportunity to sit at home and reflect on them for a while"
S-ID24	"It could be beneficial for patients to use the questions as an opportunity to take a moment at home and reflect on what bothers them. I actually think that's quite a good approach"
S-ID25	"I believe that PROMs are an excellent tool for patients as they encourage them to reflect on the issues they're experiencing with their hip. When planning surgery, the primary focus is on improving the patient's quality of life, rather than addressing life-threatening conditions. In this context, it's important for patients to be conscious of the challenges that make surgery necessary. So, in that regard, I think PROMs are a valuable tool. However, my communicative approach with patients hasn't changed since its introduction, because I cover the same content during our face-to-face discussions"
S-ID26	"I believe that the approach where patients select the most important item in each category is effective. This method allows patients to prioritise within the 3 categories, rather than simply mentioning three things. This is crucial because the first three things that come to mind may not always be the most important. The more time they have to think about it, the more relevant their answers are likely to be. Therefore, the option for them to complete the questionnaires from home is probably very meaningful and beneficial, in my opinion"

Continues >

TABLE 4 (CONTINUED) Citations from patients and surgeons categorized under each of the four themes to support themes.

ID	Citation
Theme 4: PROMs were not used in the decision-making process	
P-ID1	"There wasn't actually any discussion about the questionnaire; that wasn't the focus. We didn't talk at all about the activities I had listed, as there was no conversation regarding my capabilities and limitations. It was more along the lines of 'Can you bend it now?' and I could do that without experiencing any pain"
P-ID11	I expected to be referred for a hip replacement before coming here today because when I had my X-rays, my doctor contacted me and informed me that he had received the images from the radiology department. He then asked, 'What do you think about that?' I responded, 'Yes, I would expect them to replace my hip'. So, I had assumed that, and it was also my expectation that we would make a decision about it today"
P-ID12	"We discussed what was challenging for me in general, although not in great detail. The surgeon mentioned a score based on the criteria that would make me eligible for a new hip. While we didn't go into the specifics, it seemed sufficient for him to have no doubts. It felt like a mutual decision that I should receive a new hip - at least, that's how I perceived it"
S-ID21	"I don't use PROMs, and I intentionally avoid them because I don't personally find them beneficial. I don't believe I can rely on them as a decision-making tool. Instead, I prefer to engage in direct conversations with patients. I ask them various questions, many of which are similar to those in the questionnaire, such as 'How much pain are you experiencing?' 'Are you able to perform specific tasks?' and 'What limitations do you face?' These are the typical inquiries I make, and I prefer the open dialogue with patients over categorising their responses"
S-ID25	"I have three criteria that I communicate to my patients: 1) They must experience hip-related pain; 2) I need an X-ray showing an issue, and 3) I require an objective examination demonstrating an issue. If these three criteria align, then we come to an agreement on surgery. I hope that all surgeons follow the same approach because these three elements need to be in place. As a rule, I do not proceed with surgery after just one conversation. Even if the patient mentions, 'I have pain, but it's not bothering me much', I would respond with, 'Alright, we can always consider surgery'. In such cases, I might administer a blockade during the procedure, and then it's a matter of saying, 'See you later'"
S-ID28	"It's quite fascinating because some of the questions in PATOS, which are generated by the patients themselves, seem to be directed towards me, as if the patients had certain expectations they would like me to address. However, some of these questions don't align with factors that influence the decision for or against surgery, as I see it. The primary basis for engaging in a dialogue with the patient about a hip operation is their pain. It is crucial to clarify this with the patient because there is virtually nothing else we can promise, and we cannot even guarantee a 100% success rate. Some individuals may become dissatisfied because their pain doesn't completely disappear, often due to underlying back problems or hip-related issues that may not be immediately evident. However, emphasising this point is vital as it helps maintain a smooth patient flow and fosters effective interaction when we clarify what the patient hopes to achieve through the examination"

ID = identification number; P = patient; PATOS = Patient Activity Treatment Outcome Scale; PROMs = patient-reported outcome measures; S = surgeon.

Trial registration: not relevant.

Results

Four themes emerged from the analysis: 1) Patient involvement is key, 2) Questionnaire load, 3) Meaningful home-based completion of questionnaires, and 4) PROMs were not used in the decision-making process. In the following, references carrying an S-ID are surgeon quotes, whereas P-IDs are patient quotes.

Patient involvement is key

Both patients and surgeons emphasised that patient involvement was key to developing a trustful relationship between surgeon and patient. Surgeons found that involvement is crucial (S-ID28, Table 4) because the patient's expectations of potential surgery should align with the expected satisfactory outcome.

Patients had expectations of involvement as surgery involved their bodies, and they felt that surgery was a major decision. However, following their conversation, most patients trusted that the surgeon had the specialist knowledge needed to decide about surgery. Patients associated patient involvement with experiences of being listened to, seen and treated as human beings during the consultation.

The patients did not expect the surgeon to talk about their PROMs, even though they were introduced as an initiative to increase patient involvement in healthcare decisions related to potential surgery. Surgeons did not consider PROMs as a tool to increase patient involvement as they verbally asked patients some of the same questions. Surgeons preferred to ask about aspects such as pain during in-person patient interactions. This approach led some patients to question their need to complete the questionnaires. Thus, actions to foster patient involvement in the relationship overruled the application and potential of PROMs known from the literature, such as systematic assessment of patients.

Questionnaire load

The integration of PATOS with other PROMs made it difficult for surgeons and patients to exclusively discuss PATOS during the interviews. Most surgeons stated that they always read PROMs before seeing their patients, while some stated that they had stopped reading PROMs as they were too lengthy. However, following their

conversation, most patients trusted that the surgeon had the specialist knowledge to decide about surgery.

Patients mentioned the high number of questions (P-ID1, Table 4). They doubted whether they had answered the questions correctly as some questions seemed similar but were phrased differently. Patients took between 15 and 45 minutes to complete the PROMs, making it difficult for them to stay focused. Patients stated that it would be helpful to consider the repetition of contents in the PROM battery (see Table 1). Patients completed PROMs as part of the information needed for the hospital trajectory and research.

Surgeons agreed that PROMs might be relevant for both patients and surgeons by providing valuable data to inform quality work and research. However, PROMs should not lead to patient questionnaire overload, and some surgeons stated that more knowledge about the current PROM package is needed to clarify which PROMs should be used and how.

Meaningful home-based completion of patient-reported outcome measures

Most patients completed the PROMs at home. Patients who could not complete PROMs at home were asked to do so when arriving at the hospital for their consultation. Patients conveyed that completing the PROMs at home prompted them to reflect on their situation, priorities and goals concerning potential hip or knee arthroplasty. The questions helped them raise awareness of their current situation and realise that surgery may not fulfil their wishes for future daily activity abilities.

Surgeons stated that PROMs supported their consultations as patients who had completed them at home seemed clearer about their situation when attending their consultation (S-ID24, Table 4). The interviews revealed that completing extensive PROMs with numerous questions required a quiet context conducive to concentration for PROMs to be perceived as meaningful to patients.

Patient-reported outcome measures were not used in the decision-making process

According to patients and surgeons, although PROMs were available, they were rarely used. Few surgeons used PROMs to clarify patient expectations, whereas most preferred a more traditional conversation with patients. Surgeons stated that their assessment relied on objective information such as patient X-rays and a physical examination in the decision-making process and aimed to determine if a patient was a candidate for surgery (S-ID25, Table 4). Patient preferences were considered to form part of a dialogue, including information on the process, risks related to surgery and what to expect in terms of physical ability. Patients did not experience PROMs being used for decision-making as their self-reported measures were not verbalised during the conversation. Patients trusted the opinions of the surgeons in terms of their X-rays and how/if the condition of their hip or knee could be improved by an arthroplasty.

Discussion

This study identified four themes relating to patients' and surgeons' experiences with PATOS as part of PROMs and their influence on patient involvement and healthcare decisions. First, patients and surgeons agreed that patient involvement is key for a good consultation. Second, the interviews uncovered that the PROMs applied were cumbersome for patients to complete and for surgeons to apply. Third, PROMs positively affected patients who completed them at home, and surgeons found that these patients were better prepared for consultations. Fourth, patients and surgeons did not use PROMs to guide healthcare decisions. Minor themes not discussed in this paper are variations in patient satisfaction with consultations and the impact of PROMs on treatment adherence. Exploring these may potentially offer insights into how PROMs are best integrated into clinical practice.

A review from 2017 found that PROMs may potentially yield insights into orthopaedics and that PROMs will advance the field in a way that can contribute to science, improve patient care and save resources [3]. Our study has shed light on complexities related to using PROMs in routine orthopaedic clinical practice as the PROMs in this study failed to foster patient involvement or change procedures during healthcare decisions. According to the literature, clinicians' engagement with PROMs is of major importance and may be influenced by how clinicians are involved, introduced to and trained in the application and communication of PROMs [15-19]. In the orthopaedic department, introducing PATOS as part of a PROM battery was an initial step, which was not based on a theory-driven implementation strategy. This may explain the lack of adoption and why the results did not support the existing literature on the benefits of implementing PROMs in clinical care. Moreover, the results highlight pitfalls and quality indicators associated with PROMs [18]. They suggest that the PROMs might be too extensive, posing a barrier to practical implementation in clinical settings. This was evident in our study, particularly the importance of evaluating the length and purpose of the PROMs. Based on the insights from our qualitative study, the clinical use of PROMS was unclear based on the PROMs completed for the clinical databases, and the potential benefits of enhanced patient care through PROMs have yet to be fully realised.

This study's strengths include an in-depth qualitative approach and a large, diverse participant group. However, participants struggled to distinguish PATOS from the PROMs battery, making their experiences more reflective of the overall battery. Despite this, PATOS, alongside the full battery, helped patients prepare for consultations. A significant limitation is the lack of evidence on PATOS's development, testing or validation, despite claims of its validation [6], with no transparent quality criteria or methods [20].

Conclusions

This study investigated the experiences of patients and surgeons with PATOS as part of a PROM battery in the context of an orthopaedic surgical outpatient setting. The study results revealed that the integration of PATOS with other PROMs made it difficult to investigate PATOS exclusively because the clinical use of PROMS was unclear based on the PROMS completed for the clinical databases. Encouraging the home-based completion of PROMs helped patients reflect on their situations, priorities and goals relating to potential hip or knee arthroplasty, leading to better-prepared discussions with surgeons. However, the study raises concerns about the extensive nature of the applied PROM battery, which may constitute a barrier to clinical application. The results emphasise the importance of refining PROMs for orthopaedic practice and further investigate how PROMs may support orthopaedic clinical practice.

Correspondence *Stine Thestrup Hansen*. E-mail: sttha@regionsjaelland.dk

Accepted 27 June 2024

Conflicts of interest Potential conflicts of interest have been declared. Disclosure forms provided by the authors are available with the article at ugeskriftet.dk/dmj

Acknowledgements The authors acknowledge the invaluable contributions of the patients and surgeons whose participation enhanced the content of this study.

References can be found with the article at ugeskriftet.dk/dmj

Cite this as Dan Med J 2024;71(11):A03240193

doi 10.61409/A03240193

https://content.ugeskriftet.dk/sites/default/files/2024-06/a03240193-supplementary.pdf

REFERENCES

1. Egholm CL, Jensen S, Wandel A, Hørder M. The implementation of the 2017 national policy on patient-reported outcomes in Denmark: an overview of developments after six years. Health Policy. 2023;130:104755. https://doi.org/10.1016/j.healthpol.2023.104755
2. Eriksen J, Bygholm A, Bertelsen P. Exploring, describing, and mapping the constitutive elements of patient-reported outcomes (PROs) used in clinical practice. Tidsskr Forsk i Sygd og Samf. 2023;21:100-32. https://doi.org/10.7146/tfss.v21i39.133818
3. Gagnier JJ. Patient reported outcomes in orthopaedics. J Orthop Res. 2017;35(10):2098-2108. https://doi.org/https://doi.org/10.1002/jor.23604
4. Wilson I, Bohm E, Lübbeke A et al. Orthopaedic registries with patient-reported outcome measures. EFORT Open Rev. 2019;4(6):357-67. https://doi.org/10.1302/2058-5241.4.180080
5. Eriksen J, Bygholm A, Bertelsen P. The association between patient-reported outcomes (PROs) and patient participation in chronic care: a scoping review. Patient Educ Couns. 2022;105(7):1852-64. https://doi.org/10.1016/j.pec.2022.01.008
6. Sørensen NS, Bjerregaard HH, Hansen L et al. Udvikling af PRO inden for knæ- og hoftealloplastik i Region Nordjylland. Aalborg: Danish Center for Healthcare Improvements, Institut for Økonomi og Ledelse, Aalborg Universitet, 2019.
7. Meirte J, Hellemans N, Anthonissen M et al. Benefits and disadvantages of electronic Patient-Reported Outcome Measures: systematic review. JMIR Perioper Med. 2020;3(1):e15588. https://doi.org/10.2196/15588
8. Carman KL, Dardess P, Maurer M et al. Patient and family engagement: a framework for understanding the elements and developing interventions and policies. Health Aff (Millwood). 2013;32(2):223-31. https://doi.org/10.1377/hlthaff.2012.1133
9. Coulter A. Engaging patients in healthcare. Milton Keynes: Open University Press, 2006.
10. Luckman S, Braun V, Clarke V. Successful qualitative research: a practical guide for beginners. Fem Psychol. 2016;26(3):387-93. https://doi.org/10.1177/0959353515614115
11. 28th Annual Conference of the International Society for Quality of Life Research. Qual Life Res. 2021;30(suppl 1):1-177. https://doi.org/10.1007/s11136-021-02976-1
12. Braun V, Clarke V. Toward good practice in thematic analysis: avoiding common problems and be(com)ing a knowing researcher. Int J Transgender Health. 2023;24(1):1-6. https://doi.org/10.1080/26895269.2022.2129597
13. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57. https://doi.org/10.1093/intqhc/mzm042
14. World Medical Association Declaration of Helsinki: ethical proinciples for medical research involving human subjects. JAMA. 2013;310(20):2191-4. https://doi.org/10.1001/jama.2013.281053
15. Stover AM, Haverman L, van Oers HA et a. Using an implementation science approach to implement and evaluate patient-reported outcome measures (PROM) initiatives in routine care settings. Qual Life Res. 2021;30(11):3015-33. https://doi.org/10.1007/s11136-020-02564-9
16. Whitebird RR, Solberg LI, Ziegenfuss JY et al. What do orthopaedists believe is needed for incorporating Patient-Reported Outcome Measures into clinical care? A qualitative study. Clin Orthop Relat Res. 2022;480(4):680-7. https://doi.org/10.1097/CORR.0000000000002059
17. Austin E, LeRouge C, Hartzler AL et al. Capturing the patient voice&;: implementing patient&;reported outcomes across the health system. Qual Life Res. 2020;29(2):347-55. https://doi.org/10.1007/s11136-019-02320-8
18. Lavallee DC, Rothrock NE, Chen AF, Franklin PD. One report, multiple aims: orthopedic surgeons vary how they use patient-reported outcomes with patients. Qual Life Res. 2023;32(2):425-33. https://doi.org/10.1007/s11136-022-03251-7
19. Horn ME, Reinke EK, Couce LJ et al. Reporting and utilization of Patient-Reported Outcomes Measurement Information System® (PROMIS®) measures in orthopedic research and practice: a systematic review. J Orthop Surg Res. 2020;15(1):553. https://doi.org/10.1186/s13018-020-02068-9
20. Mokkink LB, Terwee CB, Patrick DL et al. The COSMIN checklist for assessing the methodological quality of studies on measurement properties of health status measurement instruments: an international Delphi study. Qual Life Res.

2010;19(4):539-49. https://doi.org/10.1007/s11136-010-9606-8

