

**Hip and knee arthroplasty – patient's experiences of pain and rehabilitation after discharge from hospital**

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# HIP AND KNEE ARTHROPLASTY- PATIENT'S EXPERIENCES OF PAIN AND REHABILITATION AFTER DISCHARGE FROM HOSPITAL

## Introduction

Osteoarthritis is among the ten most disabling diseases in western countries, and is associated with an ageing population (World Health Organization, 2017). Total hip- and knee arthroplasty (THA and TKA) is a recognized surgical treatment, and the implementation of fast-track clinical pathways has reduced hospital stay from 4-10 to 2-4 days (Kehlet, 2013). The principles of treatment consist of providing standardized pre-operative information, specific anaesthetic and surgical techniques, multimodal pain management and early mobilization. The aim is to limit morbidity and quickly restore the body's normal functions after surgery (Kehlet & Thienpont, 2013). This requires multidisciplinary collaboration and active involvement by the patient (Gordon, 2010).

According to Husted (2012) pain, dizziness and general muscular weakness are the main reasons why patients remain at the hospital after THA and TKA. Research shows connections between the length of postoperative stay in hospital and patient's age, gender, living conditions, pre-operative use of crutches, physical status and the need for blood transfusions. There is even a correlation which day of the week the surgery is carried out. Kehlet (2013) points out that these factors may be reasons for why fast-track patients also may need to stay at a hospital for 6-11 days.

A recent review (Aasvang, Luna & Kehlet, 2015) reports that future challenges are not related to even shorter hospital stay, but rather to pathophysiological mechanisms during recovery, as well as an improvement to patient functioning following discharge. 30% of the patients report moderate to severe pain 2-4 weeks after THA and TKA, and better designed studies on optimal multimodal techniques are required. Another review (Beswick, Wylde, Gooberman-Hill, Blom & Dieppe, 2016) indicates that long-term and unfavourable pain is reported after THA (7-23%) and after TKA (10-34%).

The risk for developing persistent pain following inadequate postoperative pain relief is also described in an earlier review (Kehlet, Jensen & Wolf, 2006).

A quantitative study (N=85) (Ramlall, Archibald, Robinson Pereira et al. 2010) indicates a lack of medical literature on how patients experience and manage pain after being discharged after arthroplasty surgery. They recommend further research into postoperative pain management at home and within the community care services to aid patients in the rehabilitation process.

Specht, Kjaersgaard-Andersen and Pedersen (2015) also stress the lack of research about patient experiences following fast-track THA and TKA. Their study explains both importance of how patients manage pain at the hospital, and how adequate information may help them managing pain after discharge home.

Egmond, Verburg, Vehmeijer and Mathijssen (2015) describe how patients living alone struggle to cope the first weeks after THA and TKA. This is mainly because of pain, loneliness and worrying about the prosthesis function. Another qualitative study (Reay, Horner & Duggan, 2015) explores how patients deal with early discharge and the transition to home after THA. They conclude that future research should focus on the discharge process and implementation of strategies to prepare patients for possible stress factors.

Fast-track clinical pathways for THA and TKA were implemented at a Norwegian hospital in 2009 (Table 1). Patients and family members meet with nurses, physiotherapists and orthopaedists for a preparation day prior to the admission. The purpose is to prepare the patients for surgery, encourage active participation in the postoperative pain management and rehabilitation process, as well as planning for discharge home.

Patients receive information about the 0-10 Numeric Rating Scale (NRS) for pain assessment (Breivik, Borchgrevink, Allen et al., 2008). After discharge the patients are followed up by their family doctor and a physiotherapist in the community. If necessary, the patients are offered a stay at a rehabilitation centre or visits by the community care services.

The hospital's guidelines for rehabilitation comply with international recommendations (Di Monaco & Castiglioni, 2013; Pozzi, Snyder-Mackler & Zeni, 2013). The patients are trained by physiotherapists at the hospital and instructed about which exercises they should do at home. Crutches should be used for six weeks after surgery until the patient can walk steadily without limping or pain. After THA the patients are told to sleep in a supine position at night for three to four weeks after surgery. They are also instructed to limit movement for 10-12 weeks to prevent hip luxation. After TKA pain is the only restriction for bending or putting weight on the joint.

Our previous study of this patient group showed that several patients experienced postoperative pain at the hospital, and worried about pain and rehabilitation after discharge (Sjøveian & Leegaard, 2015). The purpose of this follow-up study was to describe how patients experienced pain and how they managed the rehabilitation process during the first six weeks after discharge.

This led to the following research question:

1. *What is the patient's experience of pain after discharge?*
2. *How does the patient manage the rehabilitation process?*

## Method

### Design and setting

The study followed a qualitative descriptive design (Sandelowski, 2000; Polit & Beck, 2008). Semi-structured in-depth interviews were conducted from August to December of 2015 at an orthopaedic outpatient clinic in Norway.

We recruited a purposive sample of patients discharged to their homes after successful fast-track surgery. The outpatient clinic's office staff assisted in recruitment by first mailing letters to 12 potential participants and then by telephone.

The patients visited the outpatient clinic for a three-month check-up with the physiotherapist (Table 1). Participants with THA and TKA were included, since they received the same pain regimen. All 12 potential participants accepted to be interviewed, and no barriers with communication were detected.

The sample size was evaluated based on the participant's informational power, whereby each participant provided enough data to fulfil the requirements of the study (Malterud, 2016). Furthermore, the design of semi-structured, limited-focus interviews requires a smaller sample size than open-ended interviews (Morse, 2015).

## Ethical considerations

The study is approved by the Norwegian Centre for Research Data (NSD, 2017) and meets the requirements for voluntary informed consent and confidentiality (Fontana & Frey, 2005). The Regional Ethics Committee evaluated the study as a quality-improvement project, and further approval was not required (REC, 2017).

## Data collection and analysis

The first author conducted the interviews after the check-up by physiotherapist was completed. The timeframe was about 40-60 minutes and a hand-held recorder was used. The interview guide was developed from the research questions (Table 3). The analysis process started during the interview, in which the participants' understanding of their own situation was expressed (Kvale & Brinkmann, 2009). The participants were able to relate their experiences in retrospect.

The first author transcribed the interviews verbatim and carried out a "spot check" by reading sections of the transcripts whilst playing the recording (MacLean, Meyer & Estable, 2004).

A qualitative content analysis was conducted (Graneheim & Lundmann, 2004). Firstly, the first author carried out a rough categorization of each interview, and secondly text from each interview was sorted according to the questions from the interview guide. Significant sections in the text were marked, condensed and rewritten to preserve the main content (Kvale & Brinkmann, 2009). Some of the remarks were retained in their original form to illustrate the findings whilst protecting participant anonymity. The significant sections were sorted into descriptive categories (Table 4). The underlying meaning and recurrent theme's in the categories formed the sub-themes (Graneheim & Lundmann, 2004)

The second author contributed by controlling quality at all stages of the analysis process, beginning with the design stage when research questions and the interview guide were formulated, and continuing until the presentation of findings.

## Findings

The sample consisted of six women and six men, age range 45-79 years. Six had THA and six had TKA. Most of them lived with their spouses (Table 2).

All participants got physiotherapy and carried out various training exercises in the course of the first weeks. The following three subthemes are derived from the research questions and categories; pain while moving and resting, assisted daily living, and lack of continuity in pain assessment (table 4).

### Pain while moving and resting

In summary 11 of the participants, six with THA and five TKA, experienced pain the first week after discharge. The following weeks they experienced differing degrees of pain while moving and resting. After THA they reported diminished pain after three to four weeks, and after TKA diminished pain after three to five weeks (Table 5). Sleep disturbance, muscle pain, swelling and stiffness were described by both groups, while patients with knee prostheses more specifically described joint pain.

The pain experiences after THA was mainly related to muscle pain and swelling, and less to the prosthesis itself. Four participants managed to walk inside their homes, and walked short distances outdoors with crutches the first week. One of those needed to use the neighbour's stairlift the first week due to pain and swelling, while others supported themselves on the banister of the staircase because of weakness and stiffness. One missed advice from the physiotherapist about limitations to movements. He walked several hours a day outdoors which caused intense pain. Another wanted to get started as quickly as possible, but her condition *"went a bit up and down"* the first three weeks (P#10). During the physiotherapy exercises one described *"stiches in the groin, but no direct pain"* (P#3), while another experienced *"pain that diminished when the exercises was ended"*, and also described *"muscle pain in the tight and calf"* during the first weeks (P#2).

Two participants described difficulties with movement the first week. One experienced constant pain and unexpected swelling in the thigh muscles. He stated: *"I thought I never would be able to walk again. I felt shivers and pain running downwards from the wound and the thigh, and around my knee. It was a difficult time for me"* (P#5). He was readmitted in hospital after eight days, and experienced pain until the community physiotherapist gave him massage after the second discharge. Another experienced severe swelling around the hip and buttocks, which resulted in pain when sitting, laying, or getting in and out of a chair. She stated: *"It would be an advantage to walk all day, but I couldn't manage that... Using the toilet, especially bowel movements, was a torture"* (P#3).

Others experienced pain peaks at night, and found it uncomfortable to sleep on their back. One stated: *"I slept very badly in the beginning. It really hurt a lot. I had to lie on my back and that was not the best position for me"* (P#4).

The pain experiences after TKA was both related to the joint and the muscles. One described *“stinging pains and burning sensation”* (P#1), or *“the knee was sore.. there was some numbness”* (P#6), *“nagging and aching pain.. as a barbed wire inside the joint..radiating pain downwards the leg”* (P#9). Another described *“trembling in the muscle”* (P#8), and *“knee pain because of swelling”* (P#11).

Four of the participants walked inside their homes with crutches the first week, but some of them found it difficult to climb stairs without a banister, to sit on the toilet without support rail on the wall, or to climb stone stairs outdoors using crutches. They ascribed this to muscle weakness and joint pain. One managed to climb stairs without much trouble the first week. Two other participants experienced restricted movement the first week because of intense pain. One of them had a large accumulation of blood and swelling in the muscles, and experienced too rapid reduction off analgesics. He described severe pain and trembling of the muscles, and could not stretch out his leg the first two to three weeks. He stated: *“Bending the operated knee going down stairs, then moving the other leg to the next step, you get ALL the weight while bending the knee ... That is the worst part”* (P#8).

Another only experienced pain during the first weeks when she stood still for a long while, but felt no pain when moving. From the fifth to the seventh week she experienced pain peaks once or twice a week regardless of movement. One participant who described a NRS value of +7 the first week felt that pain was intensified by suffusion of blood behind the thigh. She stated: *“Most of the pain occurred while standing still, because you feel things more intensely in that position”* (P#9). This participant also experienced pain during and after physiotherapy exercises, even though she had taken Tramadol in advance. Her pain experience diminished after five weeks.

Three participants described difficulty finding a good sleeping position and experienced pain while sleeping at night. One was also bothered by night sweats and swelling of the knee.

### Assisted Daily Living

In summary eight participants, five with THA and three with TKA, got help from family members with personal hygiene, dressing or kitchen work. Using crutches while preparing food or standing in the shower was problematic. Participants with THA were also worried about damaging the joint.

After THA only one participant described himself as self-reliant for daily activities, and in that case the spouse worked part-time. The other five participants needed help from family members to dress and/or attend to personal hygiene. One of them also received public assistance for housework during the first weeks since the spouse also needed help. Some participants experienced in particular that donning socks on the operated leg was difficult. One stated: *“I can manage to put on my shoes with a shoe horn, but I had trouble with my sock. I bought a grabber to help don my sock, but I could not get it to work”* (P#2).

Another described how she was able to prepare food after two days, shower alone while sitting on a shower stool, but needed help donning her socks by her husband.

Two participants said they were afraid of moving their hip the wrong way, falling and injuring the joint, and to get infection around the prosthesis. One of these used a walker while her husband was at work, which also made it easier to prepare meals.

After TKA three participants described themselves as self-reliant for daily activities, and none of those lived alone. One only needed supervision from family members while walking in exterior stairs. When doing kitchen work another participant used a trundle chair because the crutches easily felt on the floor. Another rested on the good leg when making food, whilst leaning the crutches against the kitchen bench. One leaned on the good leg when showering, and used gym shoes or anti-skid socks to avoid slipping.

The three other participants relied on assistance or supervision from family members in respect of showering, dressing or preparing of food. One was afraid to slip while showering, and needed her husband nearby. Another stated: *"In fact, I think the first month was pretty awful. If my helpful family members were not around, then, well...I do not know how things would have gone"* (P#8). One was offered help from the community care services following a rehabilitation stay, but wanted her daughter to help instead. She stated: *"Making food, that was perhaps what was the worst for me... standing by the stove or at the kitchen bench making food with two crutches"* (P#11).

### Lack of continuity in pain assessment

The participants were satisfactory prepared with respect to further physiotherapy and practical aids, and received medical prescriptions prior to discharge (Table 5). Eight participants said they nevertheless could need more individualized information by the health care professionals in hospital about movement training, anticipated pain, use of analgesics and whom they should contact if unexpected incidents occurred after discharge. Some also experienced that the community care services failed to follow up on issues related to pain. One said: *"When you come home and you sort of ... Am I doing this right? What should I do? There is a little pain ... How is this? How shall I tackle this?"* (P#4). Another stated: *"I was simply told I should not do this or that with the knee, and that there were things I should make sure not to do"* (P#1). As for information about pain management and how long you should use analgesics, another replied: *"I really cannot remember because I was given some tablets that I should bring home because it was Sunday..so I should talk with the family doctor about it later"* (P#12).

Most had regular contact with the family doctor after discharge, but their pain was not registered unless the participant raised the topic. Three participants contacted the emergency ward, family doctor or hospital the first weeks to get new prescriptions for

analgesics, and two were given opioids by family members. One participant thought the standardized pain regimen had little effect, but did not contact the doctor about it. Two participants received help with medication from the community care services, but their pain was not registered. Another participant experienced that nobody at all from the health care services had assessed her pain after discharge.

The first week one participant experienced “*extreme pain*” (P#3) in her hip and buttocks while seated, and asked the community care services to give her a relief cushion. This application had to be formally approved by another entity, so she found her own solution using soft cushions instead. She stated: “*I think that the community care services are a bit disorderly, but that’s alright. I know they are busy and have many people to take care off. All the same, I think they could have followed up a bit better in this case*” (P#3).

## Discussion

The purpose of the study was to describe the participants' experience of pain and the rehabilitation process during the first six weeks after discharge. Participants described varying degrees of pain while moving and resting, affecting both rehabilitation and sleep. Several got help from family members to perform daily activities. Lack of individualized information prior to discharge, and need for more systematic assessment of pain by the community care services, were also important findings.

Pain intensity was not clearly linked to type of arthroplasty in our study, but the characteristics of pain seemed to vary between the groups. On the basis of previous research we can assume that patients with knee prostheses may need more analgesics. Egmond et al. (2015) reports that patients after TKA often experience more pain compared with THA, although they got appropriate pain therapy when discharged. Our study describes how pain, swelling and reduced muscular strength were limiting factors during rehabilitation. Some of the participants with a knee prosthesis experienced pain when applying full weight to the knee while climbing stairs, while those with hip prostheses emphasized how walking function was generally hindered by muscle weakness, swelling and stiffness. Two earlier studies emphasize that THA and TKA result in considerable reduction of strength to thigh muscles, and that physical rehabilitation should focus more on strengthening muscles at an early post-operative phase (Kehlet, 2013; Bandholm & Kehlet, 2012).

Some of the participants in our study did not anticipate swelling or suffusion of blood in the muscles. Aasvang et al. (2015) explain the pathological consequences of arthroplasty surgery which includes pain, oedema, infection, slowed reflexes and that muscular strength is regained more slowly by elderly persons than younger people.



Whilst the participants in our study with knee prostheses more directly described joint pain, the participants with hip prostheses spoke of restricted movement that affected rehabilitation. Some worried about putting weight on their hip in the wrong way. This corresponds with Reay et al. (2015), where restriction to movement resulting from THA was described as a burden for patients after discharge.

Our study showed that several participants experienced sleeping problems and pain at night. For participants with THA the problems were mostly related to lying on their side, whilst participants with TKA did mostly mention pain and swelling around the joint as a problem. This is supported by Aasvang et al. (2015) reporting that patients sleep more often at daytime due to more pain at night, and their activity is reduced for at least nine days after fast-track THA and TKA. Interventions for improving sleep are therefore decisive to reduce pain and promote recovery (Aasvang et al. 2015). Egmond et al. (2015) found that patients after THA complained of sleep problems the first few weeks after surgery because of restrictions to their sleeping position, whilst patients after TKA did not have sleep problems.

An important finding in our study was that eight of the participants received varying degrees of assistance from family members during the first weeks. Having a person in the same house seemed to contribute to safety and improved their ability to function in daily life. Limited assistance like help with dressing made it easier to perform different daily activities. The intention with fast-track clinical pathway is to let patients participate in the recovery process and help them to manage daily life better after discharge home (Specht, Kjaersgaard-Andersen & Pedersen, 2015). On the other hand, Egmond et al. (2015) emphasize that patients living alone may experience problems with using crutches. This is supported by Reay et al. (2015) who emphasize that patients with hip prostheses may experience loneliness and social isolation as a challenge. Another qualitative study from 2014 emphasizes how the family members of elderly persons in a fast-track clinical pathway offer practical and cognitive support during the hospital stay and after discharge. Family members may often become “nurses-light” after discharge, with the idea of not becoming an extra burden on community care services (Bertelsen, Lindhardt & Fredriksen, 2014). Several participants in our study said they felt individualized information was lacking prior to discharge in respect of pain therapy, mobilization, and whom they should contact. This patient perspective is also supported by Ramlall et al. (2010), who recommend more individualized information prior to discharge where pain management and medication are concerned. The need for adapted information is supported by an earlier study in which patients undergoing fast-track THA describe being worried prior to discharge about pain management, mobilization and need for more help (Hunt, Hall & Murthy et al., 2009). However, our study assumes that individualized information was given, but that new questions and challenges could arise after discharge. Kruzik (2009) stresses the problem that even if information is given, patients may have different coping strategies for absorbing the detailed information they receive.

Our study indicates that the participants generally followed the recommended rehabilitation programme and was followed up by physiotherapists. However the participants were more uncertain regarding advice on pain treatment from the community nurses and family doctors. An earlier study (Specht, Kjaersgaard-Andersen, Kehlet & Pedersen, 2015) emphasizes the importance of the nurses' communication skills when taking care of patients in fast-track clinical pathways. They describe how nurses have taken over several of the surgeon's and physiotherapist's tasks in hospital: instruction, providing information and motivating the patients. Our study illuminates that community nurses also need to be more involved in pain treatment, and must collaborate with family doctors and physiotherapists. The importance of multidisciplinary collaboration is highlighted by Westby and Bachman (2010). They emphasize that both good interaction between patients and health care professionals, and among different professional groups, is decisive to attain the desired rehabilitation goals after arthroplasty surgery.

### **Strengths and limitations of the study**

The participants gave detailed descriptions of their pain experience and rehabilitation process through qualitative in-depth interviews. They used good illustrations and appeared to be prepared for the interviews. The interviewer has previous research experience from similar patient groups and interviewing techniques, which helped the interviewer strengthen the participants' informational power (Malterud, 2016). The limitations of the study were that only one hospital was represented and the interviews were carried out retrospectively. Reservations are made to the fact that some of the information might be inaccurate, e.g. regarding the duration of pain, stated NRS values and the use of analgesics. Their current pain experience and the interview situation itself may also affect the way the participants described their experiences. Earlier research show that patients do not want to complain about pain, especially when asked by a professional researcher or health care provider (Leegaard, Nåden & Fagermoen, 2008).

### **Conclusion**

Our study demonstrates that pain, swelling and reduced muscular strength can affect the rehabilitation process during the first weeks after discharge. Patients may need more individualized and adapted information prior to discharge, as well as more multidisciplinary follow-up by doctors, physiotherapists and possibly home care nurses. We recommend more studies examining how patients experience pain and rehabilitation during the first weeks after completing arthroplasty.

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