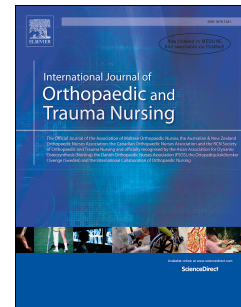


Journal Pre-proof

Quality of counselling assessed by patients after total knee arthroplasty: A cross-sectional study

Antti-Jussi Haapala, Pirjo Kaakinen, Mira Rajala, Maria Kääriäinen, Helvi Kyngäs, Merja Fordell, Merja Meriläinen, Kristiina Mikkonen



PII: S1878-1241(22)00036-3

DOI: <https://doi.org/10.1016/j.ijotn.2022.100956>

Reference: IJOTN 100956

To appear in: *International Journal of Orthopaedic and Trauma Nursing*

Received Date: 19 July 2021

Revised Date: 20 June 2022

Accepted Date: 22 June 2022

Please cite this article as: Haapala, A.-J., Kaakinen, P., Rajala, M., Kääriäinen, M., Kyngäs, H., Fordell, M., Meriläinen, M., Mikkonen, K., Quality of counselling assessed by patients after total knee arthroplasty: A cross-sectional study, *International Journal of Orthopaedic and Trauma Nursing* (2022), doi: <https://doi.org/10.1016/j.ijotn.2022.100956>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2022 Published by Elsevier Ltd.

Quality of counselling assessed by patients after total knee arthroplasty – a cross-sectional study

Antti-Jussi Haapala, RN, MHSc

Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland

Pirjo Kaakinen, RN, PhD, Senior lecturer,

Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland.

Orcid: <https://orcid.org/0000-0002-4991-671X>

Mira Rajala, RN, MSc, University teacher, Doctoral candidate

Maria Kääriäinen, RN, PhD, professor

Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland.

Helvi Kyngäs, PhD, professor

Research Unit of Nursing Science and Health Management, University of Oulu, Finland

Medical Research Center, Oulu, Finland

Merja Fordell, RN, MSc, Chief Nursing Officer

Merja Meriläinen RN, PhD, Research Nursing Officer

Oulu University Hospital, Medical Research Center Oulu, Finland

Kristiina Mikkonen, PhD, professor, Research Unit of Nursing Science and Health Management,
University of Oulu

Author contributions

Study design: A-J H, KM, HK, PK, MF, MM

Data collection: PK, MM, MK, HK

Analysis: A-J H, PK

Manuscript preparation: A-J H, PK, MR, MM

Final approval: PK, MM

Quality of counselling assessed by patients after total knee arthroplasty: A cross-sectional study

Abstract

Patient counselling is a key function in nursing. High-quality counselling promotes adherence to treatment and reduces complications. The purpose of the study was to describe the quality of counselling experienced by total knee arthroplasty patients following surgery.

The study was a descriptive cross-sectional study. The data were collected from patients following total knee arthroplasty (N=60) in 2016 with a modified Quality of Counselling Instrument, and analysed using statistical methods.

Over half of the patients (58%) were women and the mean age was 68 years (range 49–84). Over a quarter of patients (28.9%) lived alone, and about two-thirds were overweight (42.1%), or obese (31.6%). After surgery, many patients (88%) experienced moderate pain.

Half of patients (52.6%) received a good quality of counselling for the disease and its treatment, and counselling for recovery from treatment (81.6%) was good. Most patients (92.1%) received satisfactory counselling about physical activity. There was a correlation between the disease and its treatment counselling and quality of life ($r=-0.553$, $p=0.003$) and pain ($r=-0.657$, $p=0.000$). Interaction during counselling was good (97.4%) and it was implemented in a patient-centred way (89.5%).

High-quality counselling implemented in a patient-centred manner can play a part in reducing pain and increasing patients' quality of life.

Keywords: arthroplasty, counselling, pain, quality

Introduction

Total knee arthroplasty (TKA) is one of the most common surgical procedures and is an effective treatment method for end stage osteoarthritis (OA) (Postler et al. 2018). In 2019, 13,460 TKA surgeries were carried out in Finland and the number has been steadily increasing (Finnish Arthroplasty Register). TKA reduces pain, improves function, and increases quality of life (QOL) (Dash et al. 2017, Høvik et al. 2018, Price et al. 2018, Neuprez et al. 2019, Sharma et al. 2020).

As well as the number of TKA patients continuing to rise, the need for counselling will also increase due to the shortening of treatment periods. Counselling will also need to be implemented over a shorter time period (Kaakinen 2013, Eloranta et al. 2016, Kaakinen et al. 2017, Jenkins et al. 2019). Patient counselling is a broad term used to refer to education, guidance, tips, and information

relevant to their current situation that patients receive from healthcare professionals. In this study, counselling also concerns the mutual interactions between patients and healthcare staff, whereas information/education only concerns relevant materials and explanations received by patients from healthcare staff (Kääriäinen 2007, Kaakinen et al. 2017, Mäkelä et al. 2020).

Patient counselling plays a key role in nursing and is one of its most important functions (Kääriäinen & Kyngäs 2010, Sherman 2016, Kaakinen et al. 2017, Crawford et al. 2018, Yeh et al. 2018, Lasa-Blandon et al. 2019). It is particularly relevant for patient rehabilitation after treatment (Kaakinen et al. 2016, Gröndahl et al. 2019, Kaakinen et al. 2020, Koekinbier et al. 2020). It should also be noted that Finnish social and health care is governed by specific legislation, namely the Act on the Status and Rights of the Patients (785/1992). The Act clearly states that patients have the right to receive good quality health and medical care, and individual patients must be given an explanation of their state of health, different treatment options, and the importance of treatment (785/1992).

According to previous studies, 10–20% of TKA patients felt a sense of dissatisfaction after surgery (Gunaratne et al. 2017, Huang et al. 2017, Høvik et al. 2018, Price et al. 2018, Nyvang et al. 2019, Pua et al. 2020), and one of the main factors in this troubling statistic has been post-operative pain (Nyvang et al. 2019, Birch et al. 2020, Pua et al. 2020). The present study reports on the quality of counselling after TKA as evaluated by patients themselves as part of five year follow-up study.

Background

OA is a common joint disease across the world (Kamaruzaman et al. 2017, Törmälehto et al. 2018), and one factor in patient disability is knee OA (Pellinen et al. 2016, Mikkelsen et al. 2019). The main symptoms of knee OA are joint pain, disability, and stiffness (Goh et al. 2016, Pellinen et al. 2016, Törmälehto et al. 2018, Huang et al. 2020, Koekinbier et al. 2020). TKA is a surgical option for end stage knee OA (Kizaki et al. 2019), and is one of the most common surgical procedures relating to musculoskeletal disorders (Price et al. 2018) with over 13,000 surgeries performed in Finland alone in 2019 (Finnish Arthroplasty Register). An indicator for potential TKA is knee OA which causes pain and impairs mobility (Cooke et al. 2016, Goh et al. 2016, Reslan et al. 2018, Siviero et al. 2020, Sore et al. 2020) as well as decreasing QOL (Chan et al. 2013, Chesham et al. 2017, Price et al. 2018).

The importance of patient counselling in nursing cannot be stressed enough (Kääriäinen & Kyngäs 2010, Sherman 2016, Kaakinen et al. 2017, Crawford et al. 2018, Yeh et al. 2018, Lasa-Blandon et al. 2019). However, it is also important for patient rehabilitation after treatment (Kaakinen et al. 2016, Gröndahl et al. 2019, Kaakinen et al. 2020, Koekinbier et al. 2020) and it should be based on the best available information (Flanders 2018). That information must be realistic, and patients must be treated with respect and kindness by healthcare professionals (Conradsen et al. 2016). Counselling may help pain management (Chen et al. 2013), reduce anxiety and fear (Gröndahl et al. 2019), may improve QOL (Raitanen et al. 2015, Gröndahl et al. 2019, Kaakinen et al. 2020) and reduce the length of hospital stays (Jones et al. 2011, Forsmo et al. 2016).

The goal of counselling is for the patient to use his own inner resources and take responsibility for his own health and wellbeing (Raitanen et al. 2015, Kaakinen et al. 2017, Yeh et al. 2018, Casimir et al. 2013, Flanders 2018). Counselling can also reduce patient contact after a treatment period has ended because the patient has more information about their own condition as well as for self-care (Flanders 2018, Stenberg et al. 2018, Kaakinen et al. 2020). Successful counselling benefits patients and their relatives (Kääriäinen & Kyngäs 2010) and can even be said to benefit the national economy (Cara 2014, Stenberg et al. 2018). Good quality counselling improves patient satisfaction (Rajala et al. 2018), promotes adherence to the treatment plan and improves continuity of care (Raitanen et al. 2015), reduces the number of complications (Kaakinen et al. 2017, Kaakinen et al. 2020), and encourages patients to be more active in self-care and health-related decision-making (Eloranta et al. 2016). However, high-quality patient counselling requires sufficient time (Che et al. 2016, Gröndahl et al. 2019), resources, and professional staff (Kaakinen et al. 2017, Rajala et al. 2018, Kaakinen et al. 2020), not all of which are always readily available.

Patient-centred counselling focuses on understanding patients' individual needs (Bensing et al. 2013, Raitanen et al. 2015), lifestyle, and considers the patient's social as well as cultural background (Kaakinen et al. 2020, Mäkelä et al. 2020). Patient-centred counselling fosters active interaction between patient and the healthcare professional (Kääriäinen 2007, Kyngäs et al. 2017) and the patient can receive feedback in a positive atmosphere (Kääriäinen 2007, Kaakinen et al. 2020). The need for counselling is likely to increase in the future due to shortening of treatment periods and the pressure that leads to a need to implement shorter counselling times (Kaakinen 2013, Eloranta et al. 2016, Kaakinen et al. 2017, Jenkins et al. 2019). The levels of patient knowledge about their statutory rights and about their own illnesses and the treatments available have also increased (Kaakinen et al. 2013). Challenges to the implementation of counselling are brought by shorter treatment periods (Che et al.

2016, Urstad et al. 2018) and insufficient counselling resources (Flanders 2018). Because of complex modern healthcare environments, patients also need high quality information so that they can successfully manage their own health (Sherman 2016, Kennedy et al. 2017).

After TKA, it is important for patients' wellbeing that they receive adequate counselling about their illness and post-operative rehabilitation from a healthcare professional (Koekinbier et al. 2020). Following this procedure, many patients suffer from early post-operative complications such as pain, muscle atrophy, and limited joint function which inevitably cause difficulties in patients' daily life and thus decrease QOL (Xu et al. 2017). Prior to TKA patients should receive counselling about joint mobilization techniques as this is thought to decrease pain and increase range of motion (Høvik et al. 2017, Xu et al. 2017). Early mobilization will also decrease the risk of venous thromboembolism and shorten the length of hospital stay (Chua et al. 2017, Xu et al. 2017). Post-operative phase of a TKA procedure is strongly associated with postoperative pain (Donell et al. 2012, Chan et al. 2013, Chen et al. 2013, Dalury 2016, Høvik et al. 2018, Zhu et al. 2018, Jayakumar et al. 2019). Patients should receive comprehensive pain management counselling prior to discharge which should include provision of information on the use of pain medicine (Kaakinen et al. 2020), side effects of medications (Bemelmans et al. 2020), and how to tapering medication (Kennedy et al. 2017.) Post-operative counselling includes providing information about the procedure performed and possible complications (Kaakinen et al. 2020). Patients also need information about their current condition, lifestyle changes, and treatment of the disease (Sendir et al. 2013).

TKA has been studied from many different perspectives, including the effect of treatment pathways and the length of hospital stay (Gordon et al. 2011, Marsh et al. 2019), in terms of cost-effectiveness (Watters et al. 2011, Ferket et al. 2017, Kamaruzama et al. 2017, Marsh et al. 2019), patients' experiences of the surgical process (Choi & Ra 2016), and their experiences of pain in the post-operative phase (Høvik et al. 2018). However, the quality of counselling experienced by TKA patients has been studied very little over the past ten years in Finland as well as globally. The aim of the study reported here was to describe how patients experienced the quality of counselling after TKA and the factors which impact on it.

Methods

Design and data collection

140
141
142
143
144
145
146
147
148
149

150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171

A descriptive cross-sectional survey was conducted. Data were collected in 2016 from patients with knee OA (N=60) who had undergone TKA in a Finnish university hospital. Patients visited the outpatient clinic the decision to perform TKA was made and their willingness to participate in the study was also assessed at this visit. Patients participated in group counselling before TKA at the hospital by a nurse and a physiotherapist. The group counselling included information about knee arthroplasty in terms of pre- and post-stages, including mobility, follow-up, and side effects, how to prepare for surgery and the hospital stay. Inclusion criteria for the study were: 1) patients who have undergone TKA, 2) patients were adults (aged 18 or older) and 3) there was no background trauma or injuries.

The data were collected from TKA patients 6-8 weeks after TKA using a questionnaire; a Quality of Counselling Instrument (CQI, Kääriäinen 2007). The CQI contains four main dimensions (comprising 84 items), but in this survey two main dimensions were used: content of counselling (19 items) and implementation of counselling (11 items). The responses were measured using a 4-point Likert scale, ranging from one (strong disagreement) to four (strong agreement). Background data were collected, with a total of 35 background variables. The questionnaire was sent to study participants by mail six to eight weeks after their surgery; they were asked to return the questionnaire to a research assistant within two weeks of receipt. Validity, and reliability of the CQI has been assessed as good in previous studies (Kääriäinen 2007, Kääriäinen et al. 2011, Oikarinen et al. 2017, Rajala et al. 2018, Kaakinen et al 2019, Kaakinen et al. 2020); Cronbach's alpha values have varied from 0.8 to 0.9 and indicate good internal consistency. In the present study, content validity of the instrument was assessed by physiotherapists (n = 2), nurses (n = 2) and clinical nurse specialists (n=4) in the rehabilitation units and the content of the instrument was modified to suit the target group of the study regarding things such as symptoms, medication, wound monitoring, restriction of physical activity, and sick leave. Cronbach's alpha values (0.63 – 0.91) indicated high internal consistency of the modified instrument. Participation in the survey was voluntary and a research assistant mailed the questionnaire to TKA patients at home six to eight weeks after surgery.

Ethical consideration

This survey was approved by the Medical Director of the University Hospital; there was no need to seek permission of the Ethical Committee according to the terms of the Medical Research Act (488/1999) and its amendments (295/2004). The study participants replied anonymously: no personal data was collected from the participants. As it is not possible to trace personal data to individuals there was no need to anonymize the information. In accordance with the EU Data Protection Act (GDPR, 2018), this study adhered to data protection processes.

Information about the study was sent to participants by normal mail. After signing the informed consent form and completing the questionnaire, the participants sent the documents back to the hospital marked for the attention of the research assistant. Participation in the study was voluntary, and postage for return of forms and papers was prepaid. Participants were able to obtain additional information about the study from the cover letter and – if necessary – by contacting the study director. This study followed the principles of the Helsinki Declaration (World Medical Association, 2013).

Data analysis

The data analysis was conducted using IBM SPSS version 27. Descriptive statistics (frequencies, percentages, means) were used to describe the demographics and clinical variables. Few answers were missing, and missing values were replaced by means.

The principal component analysis (PCA) was used to calculate sum variables. Sum variables were categorized into three categories based on means and histograms. The values 1 to 1.99 represented poor counselling, 2 to 2.99 satisfactory counselling and 3 to 4 good counselling. Cronbach's alpha values were between 0.63 and 0.91 (see Table 1). Three sum variables were identified relating to the content of counselling: 'the disease and its treatment', 'recovery from treatment' and 'physical activity'. Two sum variables were identified for implementation of counselling: 'interaction during counselling' and 'patient-centred counselling'.

Background variables (age, gender, BMI, physical activity, form of housing, QOL and pain) were categorized into two categories based on mean and histogram. The relationships between the background and sum variables were tested using the Chi-Square test (χ^2 -test). Differences in mean scores between background and sum variables were tested using a Mann-Whitney U test and t-test

based on distribution. Pearson correlation coefficients were measured from results between sum variables and background variables (Polit & Beck 2017).

Findings

In total, 42 questionnaires were returned; four questionnaires were rejected because 50% of the answers were missing. The response rate was 70% (n=38). Over half of participants (58%, n=22) were female and the mean age was 68 years (range 49–84). Just over a quarter of patients (28.9%, n=11) lived alone and some were overweight (42.1%, n=16) or obese (31.6%, n=12). Most patients (88%, n=33) had moderate pain before TKA and the TKA surgery had decreased their pain (Table 2).

Content of counselling

The content of counselling focused on the disease and its treatment, recovery from treatment, and physical activity. Most of the participants (75.4%) received good quality counselling. Men (81.2%) were less satisfied with the content of counselling than women (71.2%), but that was not statistically significant.

Disease and its treatment

Just over half of the patients (52.6%, n=20) received good counselling about the disease and its treatment, while it was unsatisfactory for 15.8% (n=6) of patients. There were differences between patients' BMI and counselling on disease and its treatment: overweight (62.5%, n=10) and obese (58.3%, n=7) patients received good counselling about the disease and its treatment; normal weight (50%, n=5) and overweight (25%, n=4) patients stated that counselling about the disease and its treatment was satisfactory.

Counselling about the disease and its treatment was good in the age range 49–68 (52.6%, n=10), but there were a few patients (15.8%, n=3) who received unsatisfactory counselling. Patients from the age range 69–84 (52.6%, n=10) felt that counselling was good and only a few patients (15.8%, n=3) received satisfactory counselling in the disease and its treatment. Patients who lived with a partner

(59.3%, n=16) received good counselling in the disease and its treatment. Patients (54.5%, n=6) who lived alone stated that they had received more satisfactory disease and treatment counselling than patients who lived with a partner (22%, n=6).

TKA significantly improved patients' QOL (71.1%, n=27). Patients who felt that TKA improved significantly their QOL received good (66.7%, n=18) or satisfactory (29.6%, n=8) counselling in disease and its treatments. Some patients (28.9%, n=11) felt that TKA impacted only marginally on QOL. Patients whose TKA improved marginally their QOL reported receiving satisfactory (36.4%, n=4) or unsatisfactory (45.5%, n=5) counselling in disease and its treatment. For most patients (78.9%, n=30) TKA reduced significantly their pain. Patients who received good (66.7%, n=20) or satisfactory (30%, n=9) counselling in disease and its treatment felt that TKA significantly reduced pain.

There was correlation between disease and its treatment counselling and QOL ($r=-0.553$, $p=0.003$) and pain ($r=-0.657$, $p=0.000$). Most of the patients (78.9%, n=30) evaluated that pain had been reduced significantly after TKA; only a few of the patients (21.1%, n=8) stated that TKA only marginally affected pain. From ages 49–68 (78.9%, n=15) and 69–84 (78.9%, n=15) TKA reduced significantly pain. Gender did not have any correlation to pain: both men (46.7%, n=14) and women (53.3%, n=16) reported that TKA significantly reduced pain. For patients living alone (72.7%, n=8) or with a partner (81.5%, n=22) pain was reduced significantly. Almost all patients who had a BMI of >30.1 (91.7%, n=11) reported that pain was reduced significantly, and for patients who had BMI 18.5–25 TKA reduced pain significantly.

Recovery from treatment

Most patients (81.6%, n=31) received good counselling in recovery from treatment. Normal weight (80%, n=8), overweight (87.5%, n=14) and obese patients (75%, n=9) received good counselling in recovery after TKA. A few of overweight the patients (25%, n=3) stated counseling was satisfactory.

In age group 49-68 (78.9%, n=15) and older patients with age 69-84 (84.2%, n=16) received good counselling in recovery from treatment. Also, counselling in recovery from treatment was good among patients who lived alone (63.6%, n=7) or with a partner (88.9%, n=24).

TKA improved significantly QOL and those patients (88.9%, n=24) estimated counselling of recovery from treatment to be good and a few of patients evaluated it as a satisfactory (11.1%, n=3). Patients (63.6%, n=7) who thought that TKA improved marginally their QOL felt that recovery from counselling was good and few of them (36.4%, n=4) stated that it was satisfactory. Patients for whom counselling in recovery from treatment was good (86.7%, n=26) or satisfactory (13.3%, n=4) reported that TKA significantly reduced pain.

Physical activity

The great majority of patients (92.1%, n=35) apparently received good counselling in physical activity. The counselling of normal weight (90%, n=9), overweight (87.5%, n=14) and obese (100%, n=12) patients was good. Younger patients aged 49–68 (89.5%, n=17) and older patients aged 69–84 (94.7%, n=18) received counselling about physical activity that was good. There were only a few patients who were unsatisfied with counselling of physical activity in both age groups. Patients who lived alone (90.9%, n=10) and those living with a partner (92.6%, n=25) felt that counselling with regard to physical activity was good.

Patients who stated that TKA improved significantly (96.3%, n=26) or marginally (81.1%, n=9) QOL felt that counselling in physical activity were good. Those patients for whom TKA reduced significantly pain recorded that counselling of physical activity (96.7%, n=29) was good.

Implementation of counselling

The implementation of counselling focused on interaction during counselling and patient-centred counselling. Most of the TKA patients (93.1%) found that implementation of counselling was of a good.

Interaction during counselling

Almost all TKA patients' (97.4%, n=37) interaction during counselling was good and counselling was implemented in a patient-centred way. Normal weight (100%, n=10), overweight (93.8%, n=15) or obese (100%, n=12) patients' interaction during counselling was good and they had been encouraged to ask questions. The two age groups' – 49–68 (100%, n=19) and 69–84 (94.7%, n=18) – interaction during counselling was also good. The interaction during counselling of patients

(96.3%, n=26) who lived with a partner or patients (100%, n=11) who lived alone was good. For most of the patients (96.3%, n=26) TKA improved significantly QOL, and for all of the patients (100%, n= 11) whose TKA improved marginally QOL, interaction during counselling was good. TKA reduced significantly pain for most patients (96.7%, n=29) and their interactions during counselling were also good.

Patient-centred counselling

Most patients (89.5%, n=34) have received patient-centred counselling; only a few (10.5%, n=4) asserted that counselling was not patient-centred. Normal weight (90%, n=9), overweight (81.3%, n=13) or obese (100%, n=12) patients received patient-centred counselling. Patients from age 49–68 (89.5%, n=17) and age 69–84 (89.5%, n=17), living with a partner (88.9%, n=24) or living alone (90.9%, n=10) have received patient-centred counselling. TKA improved significantly QOL of patients (92.6%, n=25) and those (81.1%, n=9) whose QOL improved only marginally received good patient-centred counselling. Patients whose TKA reduced significantly (90%, n=27) or marginally (87.5%, n=7) pain received good patient-centred counselling.

Discussion

Patients' satisfaction with TKA has been studied extensively, but the quality of counselling experienced by TKA patients has been studied very little over the past ten years in Finland and globally. The aim of this cross-sectional survey, therefore, was to describe the quality of counselling and its impact 6–8 weeks after TKA and find out the impactful factors. However, there were no statistically significant differences between background and sum variables.

Based on this study, TKA patient counselling was mainly satisfactory. Conradsen et al.'s (2016) study supports our findings, as patients who had taken part in a patient counselling programme were more prepared self-care at home. Also Causey-Upton et al. (2017) highlighted the necessity for preoperative education in the context of TKA, stating that patients felt that preoperative counselling was helpful (Causey-Upton et al. 2017). Kaakinen et al.'s (2020) study of orthopaedic patients concluded that rehabilitative counselling was useful, but treatment appropriate for daily life and patient-centred counselling for rehabilitation was found to be insufficient after surgery (Kaakinen et al. 2020). This study finding did not support that.

The effect of counselling on pain has been studied in some depth and it seems that the results appear to vary (Chen et al. 2013, Conradsen et al. 2016 Høvik et al. 2018, Birch et al. 2020, Sorel et al. 2020). This present study found a positive correlation between counselling of disease and its treatment and pain. The counselling of patients was good in the context of the disease and its treatment, and it has meaningful impact for patients' experience of pain at home. Høvik et al. (2018) state that post-operative pain is prevalent in many patients after discharge, but patients who have received adequate counselling regarding pain are more prepared for the experience of pain at home. Louw et al. (2017) found that patients who had received pain neuroscience counselling just before TKA showed a decrease in pain sensitivity and in fear of movement. Also, Sorel et al.'s (2020) research results show that TKA patients who have counselling intervention before TKA have more positive experiences about post-operative pain management. Chen et al. (2013) had similar results to the present study; finding that preoperative counselling reduced postoperative pain in TKA patients. Conradsen et al. (2016) also found that patients who had preoperative counselling about pain seemed to be able to cope better with physical and psychological burdens. However, both Birch et al.'s (2020) study of pain counselling's impact on patient experience of pain and QOL and Aydin et al.'s (2015) systematic review found that pre-operative patient counselling only reduced pre-operative anxiety. The literature review and meta-analysis by Moharrami et al. (2021) produced similar results to those of Birch et al. (2020) and Aydin et al. (2015); they found that preoperative counselling had no effect on patient postoperative pain (Moharrami et al. 2021).

The effects of TKA on patients' QOL has been studied extensively (Dailiana et al. 2015, Dash et al. 2017, Høvik et al. 2018, Price et al 2018, Neuprez et al. 2019, Sharma et al. 2020), but how counselling affects the QOL of TKA patients has received far less attention. This present study showed that counselling does indeed have an impact on the quality of patients' lives. When counselling of disease and its treatment was good enough, it had a positive impact on QOL after TKA. Similar results have been recorded by Sorel et al. (2020) and Dash et al. (2017), whose work collectively demonstrated that patients' pre-operative counselling improved TKA patients' QOL. However, despite those seemingly strong results, the systematic review by McDonald et al. (2014) presented contrary findings.

Study strengths and limitations

Data were collected with the CQI instrument (Kääriäinen, 2007) which was modified by a group of physiotherapists (n=2), nurses (n=2) and clinical nurse specialists (n=4). The instrument was

modified to ensure its suitability for the phenomenon under study. The CQI instrument has indicated high internal consistency in previous studies, and Cronbach's alpha values have also been recorded as high (Kaakinen et al. 2012, Oikarinen et al 2017, Rajala et al. 2018, Kaakinen et al. 2019, Kaakinen et al. 2020). In this study the Cronbach's alpha values were high (range 0.63–0.91) which demonstrated good internal consistency, while PCA indicated good construct validity. Questionnaires for this study were collected by mail, and the response rate was 70% which can be considered quite good (Polit & Beck 2017). However, the ultimate number of participants was low (n=38), which may negatively affect the generalizability of the study results (Four questionnaires were rejected, because most of the answers were missing; for some reason those patients had stopped filling out the questionnaire). This study was a one-center study, so the results may not be directly applicable at national or international level due to the small sample size, but the findings strengthen the existing knowledge base.

Conclusion

Based on the results of this study, TKA patients were satisfied with the counselling they had received. Counselling about disease and its treatment and patient-centred counselling are beneficial to patients' QOL and experience of pain. This study confirms previous research findings and, based on the study outcome, clinicians should be encouraged to develop more diverse patient counselling methods to make them even more effective.

References

Act (488/1999) Medical Research Act. Available at: [SG-1999-08541-00-00-EN-TRA-00 \(SV\) \(finlex.fi\)](#) (Accessed 1 January 2021).

Act (785/1992) Act on the Status and Rights of Patients. Available at: [785/1992 English - Translations of Finnish acts and decrees - FINLEX ®](#) (Accessed 1 February 2021).

Aydin, D., Klit, J., Jacobsen, S., Troelsen, A., Husted, H., 2015 No major effects of preoperative education in patients undergoing hip or knee replacement – a systematic review. Danish medical journal 62(7): 1-5.

Bemelmans, Y. F. L., Hejken, B. M. G., Klaynen, M., Van Haaren, E. H., Schotanus, M. G. M., 2020 Patients' experiences of information brochure in knee arthroplasty. A brief qualitative study. International Journal of Orthopaedic and Trauma Nursing. PRE-ROOF.

- Bensing, J., Rimondini, M., Visser, A., 2013 What patients want. *Patient Education and Counselling* 90: 287-290.
- Birch, S., Stilling, M., Mechlenburg, I., Hansen, T. B., 2020 No effect of cognitive behavioral patient education for patients with pain catastrophizing before total knee arthroplasty: a randomized controlled trial. *Acta Orthopaedica* 91(1): 98-103.
- Cara, M., 2014 Strategies for improving the quality of verbal patient and family education: a review of the literature and creation of the EDUCATE model. *Health Psychology & Behavioural Medicine* 2(1):482-495.
- Casimir, Y. E., Williams, M., Laing, M. Y., Pitakmongkolkul, S., Slyer, J. T., 2013 The effectiveness of patient-centered self-care education for adults with heart failure on knowledge, self-care behaviors, quality of life, and readmissions: A systematic review. *JBIC Database of Systematic Reviews & Implementation Reports* 11(8):107-128.
- Causey-Upton, R., Howell, D. M., 2017 Patient Experiences When Preparing for Discharge Home after Total Knee Replacement. *Internet Journal of Allied Health Sciences and Practice* (15)1: 1-11.
- Chan, E. Y., Blyth, F. M., Nairn, L., Fransen, M., 2013 Acute postoperative pain following hospital discharge after total knee arthroplasty. *Osteoarthritis and Cartilage* 21:1257-1263.
- Che, H.-L., Yeah, M.-Y., Jiang, R.-S., Wu, S.-M., 2016 Taiwanese nurses' experiences of difficulties in providing patient education in hospital settings. *Nursing & Health Sciences* 18:113-119.
- Chen, S.-R., Chen, C.-S., Lin, P.-C., 2013 The effect of educational intervention on the pain and rehabilitation performance of patients who undergo a total knee replacement. *Journal of Clinical Nursing* 23:279-287.
- Chesham, R. A., Shanmugam, S., 2017 Does preoperative physiotherapy improve postoperative, patient-based outcomes in older adults who have undergone total knee arthroplasty? A systematic review. *Physiotherapy Theory and Practice* (33)1: 9-30.
- Choi, Y.-J., Ra, Ho., 2016 Patient satisfaction after total knee arthroplasty. *Knee Surgery & Related Research* 28(1):1-15.
- Chua, M.J., Hart, A.J., Mittal, R., Harris, I.A., Xuan, W., Naylor, J.M., 2017 Early mobilisation after total hip or knee arthroplasty: A multicentre prospective observational study. *Plos One*. Available at: <http://doi.org/10.4225/53/593a41d655052>
- Conradsen, S., Gjersteth, M. M., Kvangarsnes, M., 2016 Patients' experiences from an education programme ahead of orthopaedic surgery – a qualitative study. *Journal of Clinical Nursing* 25: 2798-2806.
- Cooke, M., Walker, R., Aitken, L. M., Freeman, A., Pavey, S., Cantrill, R., 2016 Pre-operative self-efficacy education vs. usual care for patients undergoing joint replacement surgery: a pilot randomized controlled trial. *Scandinavian Journal of Caring Sciences* (30):74-82.

- 461 Crawford, T., Roger, P., Candlin, S., 2018 Supporting patient education using schema theory: A
462 discourse. *Collegian* 25:501-507.
- 463
- 464 Dailiana, Z. H., Papakostidou, I., Varitimidis, S., Liaropoulos, L., Zintzaras, E., Karachalios, T.,
465 Michelinakis, E., Malizos, K. N., 2015 Patient-reported quality of life after primary major joint
466 arthroplasty: a prospective comparison of hip and knee arthroplasty. *BMC Musculoskeletal*
467 *Disorders* 16:366-374.
- 468
- 469 Dalury, D. F., 2016 A state-of-the-art pain protocol for total knee replacement. *Arthroplasty Today*
470 2: 23-25.
- 471
- 472 Dash, S. K., Palo, N., Arona, G., Chandel, S. S., Kumar, M., 2017 Effects of preoperative walking
473 ability and patient's surgical education on quality of life and functional outcomes after total knee
474 arthroplasty. *Revista Brasileira de Ortopedia* 52(4): 435-441.
- 475
- 476 Donell, S., Deane, K., Swift, L., Barton, G., Balls, P., Darrah, C., Gray, R., 2012 Patient directed
477 self-management of pain (PaDSMaP) compared to treatment as usual following total knee
478 replacement: study protocol for a randomized controlled trial. *Trials* 13:204-218.
- 479
- 480 Eloranta, S., Katajisto, J., Leino-Kilpi, H., 2016 Orthopaedic patient education practice.
481 *International Journal of Orthopaedic and Trauma Nursing* 21:39-48.
- 482
- 483 Ferket, B. S., Oei, E. H., Bierma-Zeinstra, S. M., 2017 Impact of total knee replacement practice:
484 cost effectiveness analysis of data from the Osteoarthritis Initiative. *BMJ*:1-12.
- 485
- 486 Finnish Arthroplasty Register. Terveystieteiden tutkimuskeskus (THL). Available at: [Far \(thl.fi\)](http://thl.fi)
487 (Accessed 20 January 2021).
- 488
- 489 Flanders, S. A., 2018 Effective Patient Education: Evidence and Common Sense. *Nurses as*
490 *Educators* 27(1):55-58.
- 491
- 492 Forsmo, H. M., Pfeffer, F., Rasdal, A., Østgaard, G., Mohn, A. C., Körner, H., Ericshen, C., 2016
493 Compliance with enhanced recovery after surgery criteria and preoperative and postoperative
494 counselling reduces length of hospital stay in colorectal surgery: results of a randomized controlled
495 trial. *Colorectal Disease* 18: 603-611.
- 496
- 497 General data protection regulation. Available at: [EUR-Lex - 32016R0679 - EN - EUR-Lex](http://eur-lex.europa.eu)
498 [\(europa.eu\)](http://eur-lex.europa.eu) (Accessed 18 January 2021).
- 499
- 500 Goh, M. L., Chua, J. Y., Lim, L., 2015 Total knee replacement pre-operative education
501 in a Singapore tertiary hospital: A best practice implementation project. *International Journal of*
502 *Orthopaedic and Trauma nursing* 19:3-14.
- 503
- 504 Gordon, D., Malhas, A., Goubran, A., Subramanian, P., Messer, C., Houlihan-Burne, D., 2011
505 Implementing the Rapid Recovery Program in primary hip and knee arthroplasty in a UK state run
506 hospital. *European Journal of Orthopaedic Surgery and Traumatology* 21:151-158.
- 507
- 508 Gunaratne, R., Pratt, D. N., Banda, J., Fick, D. P., Khan, R., Robertson, B. W., 2017 Patient
509 Dissatisfaction Following Total Knee Arthroplasty: A Systematic Review of the Literature. *The*
510 *Journal of Arthroplasty* 32:3584-3860.

- Gröndahl, W., Muurinen, H., Katajisto, J., Suhonen, R., Leino-Kilpi, H., 2019 Perceived quality of nursing care and patient education: a cross-sectional study of hospitalised surgical patients in Finland. *BMJ Open* 9:e023108. doi:10.1136/bmjopen-2018-023108.
- Høvik, L., Aglen, B., Husby, V., 2018 Patient experience with early discharge after total knee arthroplasty: a focus group study. *Scandinavian Journal of Caring Sciences* 32:833-842.
- Huang, Y., Lee, M., Chong, H. C., Ning, Y., Lo, N. N., Yeo, S. J., 2017 Reasons and factors behind post-total knee arthroplasty dissatisfaction in an Asian population. *Annals of Academy of Medicine Singapore* 46(8):303-309.
- Huang, Z., Shi, X., Li, X., Zhang, L., Wu, P., Mao, J., Xing, R., Zhang, N., Wang, P., 2020 Network pharmacology approach to uncover the mechanism governing the effect of Simiao powder on knee osteoarthritis. *BioMed Research International*: 1-13. doi.org/10.1155/2020/6971503.
- Jansson, M. M., Harjumaa, M., Puhto, A.-P., Pikkarainen, M., 2019 Healthcare professionals' perceived problems in fast-track hip and knee arthroplasty: results of a qualitative interview study. *Journal of Orthopaedic Surgery and Research* 14: 294-306.
- Jayakumar, T., Avinash, P., Suhas, B.D., Reddy, M. K., 2019 Post-operative pain management using local infiltration analgesia (LIA) in total knee arthroplasty (TKA): A prospective study. *International Journal of Orthopaedics Sciences* 5(3): 670-676.
- Jenkins, C., Jackson, W., Bottomley, A., Price, A., Murray, D., Barker, C., 2019 Introduction of an innovative day surgery pathway for unicompartmental knee replacement: no need for early knee flexion. *Physiotherapy* 105: 46-52.
- Jones, S., Alnaib, M., Kokkinakis, M., Wilkinson, M., Gibson, A., Kader, D., 2011 Pre-operative patient education reduces length of stay after knee joint arthroplasty. *Orthopaedic surgery* 93: 71-75.
- Kaakinen, P., Kyngäs, H., Kääriäinen, M., 2012 The chronically ill patients' quality of counseling in the hospital. *Journal of Nursing Education and Practice* 2(4):114-123.
- Kaakinen, P., Kyngäs, H., Kääriäinen, M., 2013 Predictors of good-quality counselling from the perspective of hospitalized chronically ill adults. *Journal of Clinical Nursing* 22(19-20): 2704-2713.
- Kaakinen, P., Ervasti, H., Kääriäinen, M., 2017 Quality of counselling for knee and shoulder arthroscopy patients during day surgery. *International Journal of Orthopaedic and Trauma Nursing* 24: 12-20.
- Kaakinen, P., Meriläinen, M., Putila, P., Kääriäinen, M., 2020 The quality of counselling in rehabilitation evaluated by orthopaedic surgery patients at a university hospital: A cross sectional study. *International Journal of Orthopaedic and Trauma Nursing* 37:1-8.
- Kamaruzaman, H., Kinghorn, P., Oppong, R., 2017 Cost-effectiveness of surgical interventions for the management of osteoarthritis: a systematic review of the literature. *BMC Musculoskeletal Disorders* 18(183): 1-17.

- Kennedy, D., Wainwright, A., Pereira, L., Robarts, S., Dickson, P., Christian, J., Webster, F., 2017 A qualitative study of patient education needs for hip and knee replacement. *BMC Musculoskeletal Disorders* 18: 413- 449.
- Kizaki, A., Shanmugaraj, A., Yamashita, F., Simunovic, N., Duong, A., Khanna, V., Ayeni, O. R., 2019 Total knee arthroplasty using patient specific instrumentation for osteoarthritis of the knee: a meta-analysis. *BMC Musculoskeletal Disorders* 20: 561.
- Koekimbier, K., Leino-Kilpi, H., Cabrera, E., Istomina, N., Johansson Stark, Å., Katajisto, J., Lemonidou, C., Papastavrou, E., Salanterä, S., Sigurdardottir, A., Valkeapää, K., Eloranta, S., 2016 Empowering knowledge and its connection to health-related quality of life: A cross-cultural study A concise and informative title: Empowering knowledge and its connection to health-related quality of life. *Applied Nursing Research* 29: 211-216.
- Kyngäs, H., Kanste, O., Patala-Pudas, L., Kaakinen, P., 2017 COPD -patients adherence to care and quality of counselling. *Journal of Nursing Education Practice* 2017; 7(3):32-39.
- Kääriäinen, M., 2007. The Quality of Counselling: The Development of a Hypothetical Model [Finnish]. *Acta Universitatis Ouluensis D* 937. University of Oulu.
- Kääriäinen, M., Kyngäs, H., 2010 The quality of patient education evaluated by the health personnel. *Scandinavian Journal of Caring Science* 24:548-556.
- Kääriäinen, M., Kukkurainen, M. L., Kyngäs, H., Karppinen, L., 2011 Improving the quality of rheumatoid arthritis patients' education using written information. *Musculoskeletal Care* 9:19–24.
- Lasa-Blandon, M., Stasi, K., Hehir, A., Fischer-Carlidge, E., 2019 Patient Education Issues and Strategies Associated with Immunotherapy. *Seminars in Oncology Nursing* 35:1-4.
- Louw, A., Zimney, K., Reed, J., Landers, M., Puente-dura, E. J., 2019 Immediate preoperative outcomes of pain neuroscience education for patients undergoing total knee arthroplasty: A case series. *Physiotherapy Theory and Practice* 35(6): 543-553.
- Marsh, J., Somerville, L., Howard, J., Lanting, B., 2019 Significant cost savings and similar patient outcomes associated with early discharge following total knee arthroplasty. *Research* 62(1):20-24.
- McDonald, S., Page, M.J., Beringer, K., Wasiak, J., Sprowson, A., 2014 Preoperative education for hip or knee replacement (Review). *Cochrane Database of Systematic Reviews* 5:1-61.
- Mikkelsen, S., Pedersen, E. B., Brauer, C., Møller, K. L. T., Koblauch, H., 2019 Knee osteoarthritis among airport baggage handlers: A prospective cohort study. *American Journal of Industrial Medicine* 62(11): 951-960.
- Moharrami, M., Anvari, H. M., Gheshlaghi, L. A., Nazari, B., 2021 Preoperative Education for Pain Relief after the Lower Limb Joint Replacement Surgery: A Systematic Review and MetaAnalysis 26(1): 52-60.

- 609 Mäkelä, K., Rajala, M., Kivelä, K., Kääriäinen, M., Kaakinen, P., 2020 Patient evaluations of
 610 asthma counselling quality in primary health care — a cross-sectional survey. *Journal of Public*
 611 *Health* 30: 177-184.
- 612
- 613 Neuprez, A., Neuprez, A. H., Kaux, J.-F., Kurth, W., Daniel, C., Thirion, T., Huskin, J.-P., Gillet,
 614 P., Bruyère, O., Reginster, J.-Y., 2019 Total joint replacement improves pain, functional quality of
 615 life, and health utilities in patients with late-stage knee and hip osteoarthritis for up to 5 years.
 616 *Clinical Rheumatology* 39: 861-871.
- 617
- 618 Nyvang, J. S., Hedström, M., Iversen, M. D., Gleissman, S. A., 2019 Striving for a silent knee: a
 619 qualitative study of patients' experiences with knee replacement surgery and their perceptions of
 620 fulfilled expectations. *International Journal of Qualitative Studies on Health and Well-being* 14:1-8.
- 621
- 622 Oikarinen, A., Engblom, J., Kyngäs, H., Kääriäinen, M., 2017 Lifestyle counseling intervention
 623 effects on counseling quality in patients with stroke and transient ischemic attack. *American*
 624 *Association of Neuroscience Nurses* 49(3): 137-141.
- 625
- 626 Pellinen, T., Vilberg, J., Raappana, M., Leino-Kilpi, H., Kettunen, T., 2016 Knowledge
 627 expectations of recently diagnosed patients with knee osteoarthritis. *Journal of Advanced Nursing*
 628 *72*(11): 2587-2868.
- 629
- 630 Polit, D.F., Beck, C.H., 2017 *Nursing research: Generating and accessing evidence for nursing*
 631 *practise*. Wolters Kluwer Health/Lippincott Williams & Wilkins. Philadelphia.
- 632
- 633 Postler, A. F., Tille, E. J., 2018 Analysis of total knee arthroplasty revision causes. *BMC*
 634 *Musculoskeletal Disorders* 19: 55-61.
- 635
- 636 Price, A. J., Alvand, A., Troelsen, A., Katz, N. J., Hooper, G., Gray, A., Carr, A., Beard, D., 2018
 637 Knee replacement. *Lancet* 392:1672-1682.
- 638
- 639 Pua, Y.-H., Poon, C. L.-L., Seah, F. J.-T., Thumboo, J., Clark, R. A., Tan, M.-H., Chong, H.-C.,
 640 Tan, J. V.-M., Chew, E. S.-X., Yeo, S.-J., 2020 Predicting individual knee range of motion, knee
 641 pain, and walking limitation outcomes following total knee arthroplasty. *Acta Orthopaedica* 90(2):
 642 179-186.
- 643
- 644 Raitanen, K., Kylmä, J., Paavilainen, E., 2015 Short-term patient and family counselling for acute
 645 health change – an integrative literature review. *Clinical Nursing Studies* 3(3):96-104.
- 646
- 647 Rajala, M., Kaakinen, P., Fordell, M., Kääriäinen, M., 2018 The quality of patient education in day
 648 surgery by adult patients. *Journal of PeriAnesthesia Nursing* 33(2):177-187.
- 649
- 650 Reslan, H. A., Moustafa, S. M., Saghie, S., Sharara, E. S., Badr, L. K., 2018 Does intervention
 651 improve the outcomes of patients after total knee replacement surgery? *International Journal of*
 652 *Orthopaedic and Trauma Nursing* 32: 26-31.
- 653
- 654 Şendir, M., Büyükyılmaz, F., Muşovi, D., 2012 Patients' discharge information needs after total hip
 655 and knee arthroplasty: a quasi-qualitative pilot study. *Rehabilitation Nursing* 38:264–271.
- 656

- Sharma, S., D'Souza, P. J. J., Badagabettu, S., Vijayan, S., 2020 Functional outcome and patients' perceived benefits after total knee arthroplasty: A cross-sectional study. *International Journal of Orthopaedic and Trauma Nursing* 39: 00791. doi: 10.1016/j.ijotn.2020.100791.
- Sherman, J. R., 2016 An Initiative to Improve Patient Education by Clinical Nurses. *Medsurg Nursing* 25(5): 297-301.
- Siviero, P., Marseglia, A., Rovini, A., Ruggieri, P., Nardacchione, R., Maggi, S., 2020 Quality of life outcomes in patients undergoing knee replacement surgery: longitudinal findings from the QPro-Gin study. *BMC Musculoskeletal Disorders* 21:436-447.
- Sorel, J. C., Overvliet, G. M., Gademan, M. G. J., Haan, C. D., Honing, A., Poolman, R. W., 2020 The influence of perioperative interventions targeting psychological distress on clinical outcome after total knee arthroplasty. *Rheumatology International* 40:1961-1986.
- Stenberg, U., Vågan, A., Flink, M., Lynggaard, V., Fredriksen, K., Westermann, K. F., Gallefs, F., 2018 Health economic evaluations of patient education interventions a scoping review of the literature. *Patient Education and Counseling* 101(6):1006-1035.
- Törmälehto, S., Mononen, M. E., Aarnio, E., Arokoski, J. P., Korhonen, R. K., Martikainen, J., 2018 Health-related quality of life in relation to symptomatic and radiographic definitions of knee osteoarthritis: data from Osteoarthritis Initiative (OAI) 4-year follow up study. *Health and Quality of Life Outcomes* 16(154):1-12.
- Urstad, K. H., Wahl, A. K., Engebretsen, E., Larsen, M. H., Vidnes, T. K., Stenwig, A. G. K., Simensen, Ø. W., Nordli, A. A. V., Andersen, M. H., 2018 Implementation of a new patient education programme for renal transplant recipients. *Journal of Renal Care* 44(2): 106-114.
- Zhu, N.-N., Xu, P.-P., Lei, T.-T., Sun, T., Chan, S. W.-C., 2018 Postoperative pain self-management behavior in patients who underwent total knee or hip arthroplasty. *AORN Journal* 105(4): 355-364.
- Watters, T. S., Marther III, R. C., Browne, J. A., Berend, K. A., Lonbardi, A. V., Bolognesi, M. P., 2011 Analysis of procedure-related costs and proposed benefits of using patient-specific approach in total knee arthroplasty. *Journal of Surgical Orthopaedic Advances* 20(2):112-116.
- World Medical Association. Available at: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects> (Accessed 20 December 2020).
- Xu, J., Zhang, J., Wang, X.-Q., Wang, X.-L., Wu, Y., Chen, C.-C., Zhang, H.-Y., Zhang, Z.-W., Fan, K.-Y., Zhu, Q., Deng, Z.-W., 2017 Effect of joint mobilization techniques for primary total knee arthroplasty. Study protocol for a randomized controlled trial. *Medicine* 96(49):1-4.
- Yeh, M.-Y., Wu, S.-C., Tung, T.-H., 2018 The relation between patient education, patient empowerment and patient satisfaction: A cross-sectional-comparison study. *Applied Nursing Research* 39:11-17.

Table 1. Sum variables, number of items and Cronbach's alpha values.

Mean variable name	Number of items	Cronbach's alpha
Content of counselling		
Disease and its treatment	8	0.88
Recovery from treatment	7	0.84
Physical activity	3	0.63
Implementation of counselling		
Interaction during counselling	7	0.91
Patient-centred counselling	4	0.75

Journal Pre-proof

Table 2. Background information of knee arthroplasty patients (n=38).

	n	%
Gender		
Female	22	57.9
Men	16	42.1
Age (mean 68)		
49–62	13	34.2
63–72	12	31.6
73–84	13	34.2
Body mass index		
18.5–25	10	26.3
25.01–30	16	42.1
>30	12	31.6
Form of housing		
Alone	11	28.9
With partner	27	71.1
Pain before TKA		
Mild	0	0
Moderate	33	86.8
Severe	5	13.2
TKA reduced pain		
Significantly	12	31.6
Satisfactorily	18	47.4
Marginally	8	21.1
QOL improved after TKA		
Significantly	13	34.2
Satisfactorily	14	36.8
Marginally	11	28.9
Physical activity after TKA		
Significantly	10	26.3
Satisfactorily	14	36.8
Marginally	14	36.8

Ethical Approval

This survey was approved by the Medical Director of the University Hospital; there was no need to seek permission of the Ethical Committee according to the terms of the Medical Research Act (488/1999) and its amendments (295/2004).

Financial disclosure

In this study, there are no financial disclosure.

Conflict(s) of interest

There are no conflicts of interest arising from this study.