Kinesiophobia and Pain Catastrophizing in Total Hip Arthroplasty Patients

An Integrative Review

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Abstract

The present study tried to provide a narrative on significance of pain catastrophizing and kinesiophobia and related intervention and management approaches. To do so, an integrative review of accessible literature for JAMK students was done to provide a narrative on significance of pain catastrophizing and kinesiophobia for THA patients, using a Framework Method thematic analysis.

Pain catastrophizing and kinesioiphobia both seem to be associated with important Total Hip Arthroplasty patient outcomes, including pain-related and functionality and activity-related outcomes such as post-operative chronic pain and low self-efficacy, even though research has been controversial. There are indications that kine-siophobia emerges in some people as a temporary response to surgery, possibly due to pain-related beliefs and lack of proper information related to physical activity.

Perioperative risk stratification, comprehensive patient education about pain and re-covery, patient-centered approaches and individualization of care plans according to each patient's situation are the most important management strategies addressing ki-nesiophobia in THA perioperative care. There is need for further research and concep-tualization.

Keywords/tags (subjects)

Total hip arthroplasty, hip replacement surgery, pain catastrophizing, kinesiophobia, patient outcomes

Miscellaneous (Confidential information)

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1 Introduction

Total hip arthroplasty (THA) is an elective surgical procedure performed on patients experiencing hip pain caused by degenerative conditions or hip fractures (Gold et al., 2023). This elective procedure has proven to be highly successful in alleviating pain and enhancing functionality, ultimately leading to an improved quality of life. THA can be considered as an option for individuals who have not benefited from other conservative treatments such as corticosteroid injections, physical therapy, weight reduction, or previous surgical interventions (Gold et al., 2023).

Hip arthroplasties are considered among the most common elective surgeries, and the most common hip reconstructive procedure performed globally. The evidence suggests these procedures contribute to substantial enhancement in physical functionality and overall quality of life for patients. Moreover, these surgeries have proven to be cost-effective and yield favorable long-term outcomes (Arias-de la Torre et al., 2019, p. 2; Jafari et al., 2019, p. 1) Patients of congenital hip dysplasia, hip trauma, and hip osteoarthritis (OA) can benefit from THA (Gold et al., 2023).

Pain catastrophizing might greatly affect emotional, functional, and physiological responses to pain, and it seems to be correlated with postoperative outcomes such as pain levels, opioid use, rehabilitation, and mobility levels (Quartana et al., 2009). Pain catastrophizing and kinesiophobia, alongside stress, depression, and low resiliency are believed to affect pain levels and disability in the hip preservation population and create challenges for non-surgical treatments (Nasir et al., 2023).

This study aims at providing an integrative literature review in order to provide a better understanding of significance of pain catastrophizing and kinesiophobia for THA patients, and how to approach it in perioperative care settings. The research question of this study

is: what is nursing role related to kinesiophobia and pain catastrophizing in patients who undergo THA?

2 Total Hip Arthroplasty

In THA, "the femoral head is replaced with a prosthetic ball and the acetabulum is relined with a prosthetic cup" (Willmott, 2015, p. 49). There are multiple approaches and techniques related to THA, including posterolateral, anterolateral, anterior, and transtrochanteric (Manninen. et al, 2017).

The surgery might be done using acrylic cement, or without cement (Manninen. et al, 2017). Cemented THA has been shown to be effective for 10-15 years with clinical data showing an almost 90% survival. Reports of long-term follow-up of cemented total hip replacements indicate clinical results approaching a 90% survival. There seems to be a rise in the occurrence of acetabular loosening in the second decade of follow-ups (Goldberg, 2007, Schwartz & Della Valle, 2013).

Hip anatomy

The hip joint is formed by the head of the femur and acetabulum of the pelvis, forming a ball-and-socket joint along with the labrum. This joint also consists of a strong fibrous capsule, and various tendons and muscles and tendons (Mortazavi & Freedman, 2019, p. 19). Figure 1 shows an illustration of hip anatomy as seen through a cut in frontal plane.

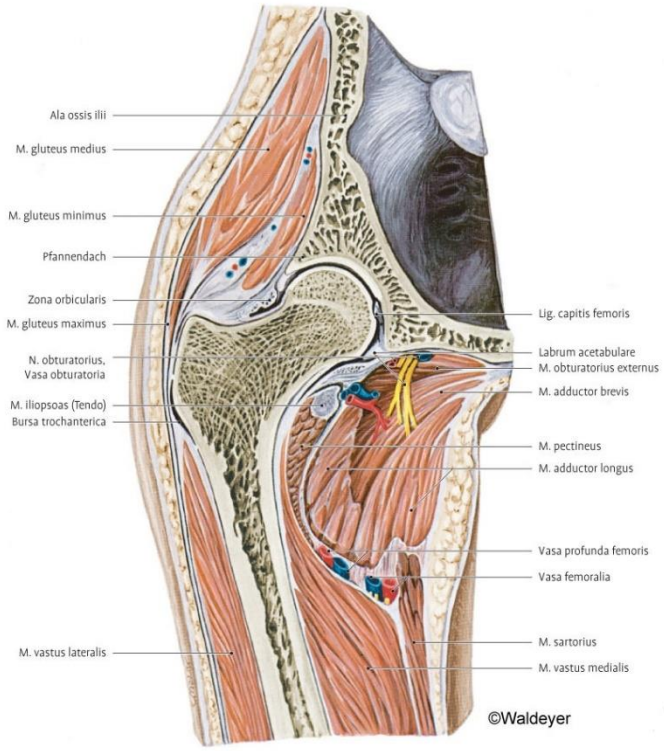

Figure 1. An illustration of hip anatomy, by Waldeyer Anatomie des Menschen, Accessed through Terveysportti.

The hip's musculature structure consists of six muscle groups, namely flexors, extensors, adductors, abductors, internal rotators, and external rotators (Waterman et al., 2020). These muscles contribute to various movements and functions with the assists of the hip's three ligaments, iliofemoral, ischiofemoral, and pubofemoral.

The circulatory supply of the hip joint consists of medial and lateral circumflex arteries which are continuations of the deep femoral artery. The femoral head blood supply is provided by the foveal artery which branches off the posterior branch of the obturator artery. Lastly, nutrient artery of the femur transfers oxygen and nutrients to the femur, branching off from perforating branches of the deep femoral artery through medullary cavity (Waterman et al., 2020, Jagernauth & Lee, 2018).

The hip joint is the connector part between lower limbs to the trunk and pelvis and mainly contributes to dynamic support of the trunk and plays a significant role in transmitting load and force from axial plane to lower part of the body. The ball and socket shape of the hip joint can help with absorbing shocks and generating force through most movements. The hip joint facilitates movement in three different axes: flexion and extension, internal and external rotation, abduction and adduction (Gold et al., 2023, Waterman et al., 2020).

Osteoarthritis

OA is the world's most common joint disease; however, its root cause is not fully understood. It can lead to joint pain and dysfunction and is considered a significant life-changing disorder. It can impact all synovial joints, with the knee being the most commonly affected (Buckwalter, et al., 2013). The most significant risk factors of OA are age, hip joint deformities and developmental disorders, and hip injuries (Working group appointed by the Finnish Medical Society Duodecim, 2018).

The primary form of OA is the most prevalent. About 12% of all OA occurrences are post-traumatic osteoarthritis (PTOA); a condition that occurs after a joint injury and can cause long-term pain and disability for a significant number of individuals. The initial joint injury and subsequent residual joint abnormalities, such as instability and articular surface incongruity, contribute to the gradual deterioration of articular cartilage, bone remodeling, and alterations in the soft tissues surrounding the joint. These factors ultimately lead to the development of PTOA. It is now recognized that even though the risk of PTOA can be substantial following an injury, PTOA is not an unavoidable outcome of the initial mechanical damage (Buckwalter, et al., 2013).

In Finland, clinical hip OA happens to less than 1% of population under the age of 36 years old, but its prevalence increases significantly in the 65-74 year old group (12.2% for men and 11.5% for women). In the 75–84-year-old group, 20.4% of both men and women

are diagnosed with hip OA (Arokoski et al., 2007). Moreover, a retrospective registry study of Terveystalo (Finland's largest private and occupational healthcare provider) showed that 5.6% of the clients had been diagnosed with hip or knee OA, and as expected, this number increased by age (Summanen et al, 2021).

Symptoms and manifestation

Pain, stiffness, and limited joint function are the most common symptoms of OA. Pain is usually described as gradual onset of groin or anterior thigh pain which often radiates to the knee. Initially, heavy and prolonged physical activity and burden on joint can trigger the pain. Patients might have difficulty performing daily activities such as walking, sitting, standing, using the stairs, and sleeping. (Hooper & Moskowitz, 2007, Manning et al., 2017, Jagernauth & Lee, 2018).

As the condition progresses, pain tends to be experienced more often, and with lower burden threshold. Loss of joint's cartilage is a common occurrence. Range of motion might decrease due to lack of space in the joint (especially in flexion and external rotation), and atrophy of the surrounding muscles might develop. These can all lead to decrease in functionality and affect people in various manners (Hooper & Moskowitz, 2007, Manning et al., 2017, Jagernauth & Lee, 2018).

Basic guidelines of treatment

The aims of treatment of OA are proper pain management, management of functional capacity, and prevention of disease progression. Treatments should be individually tailored to individuals according to the risk factors, level of pain and functionality, level of structural damage to the joint, and their wishes (Zhang et al., 2005, Jordan et al., 2003, Stitik & Hochberg, 2007, Culp & Brett, 2020). A brief overview of hip OA treatments can be found in Figure 2.

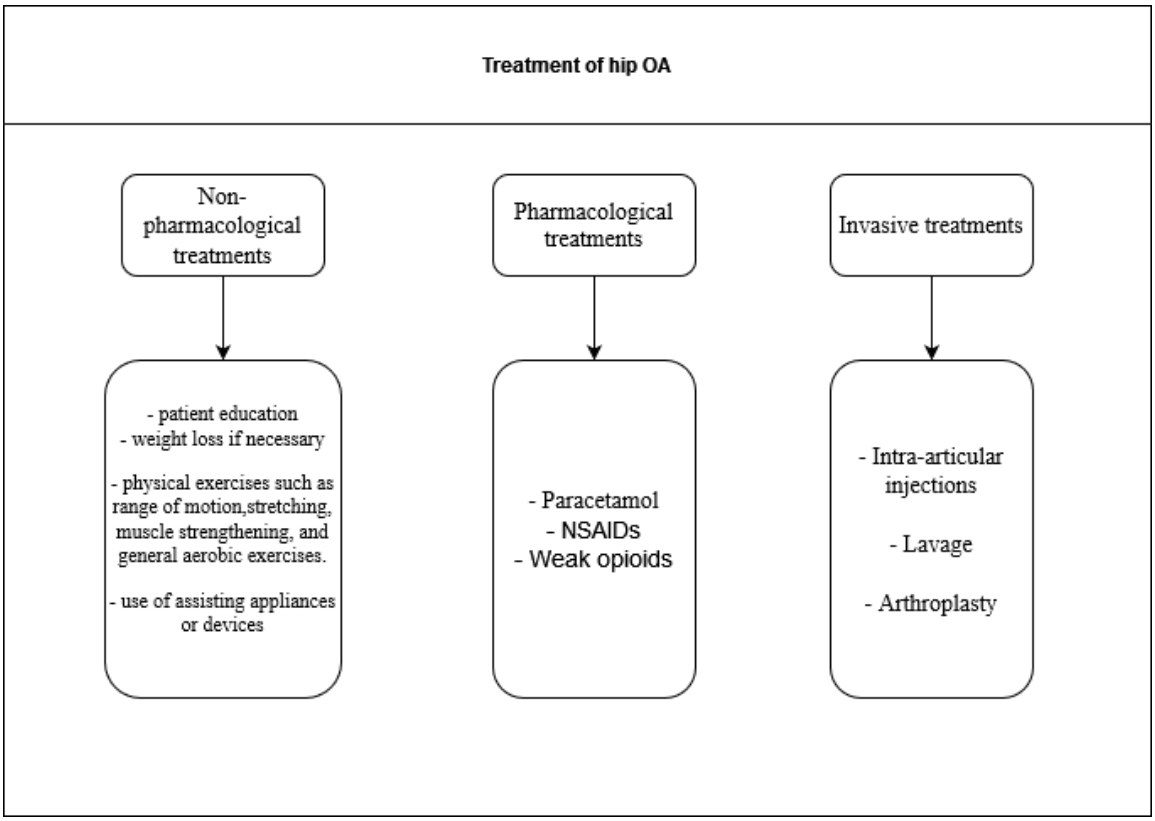

Figure 2. An overview of hip OA treatments. (Zhang et al., 2005, Jordan et al., 2003, Culp & Brett, 2020)

Surgical indications and considerations

More invasive surgical procedures might be considered as viable treatment options in case non-surgical options alone don't contribute to individual's care goals. Hip arthroplasties can be considered in case of severe pain (i.e., presence of rest pain), severe reduced functionality and quality of life, and imaging findings indicating rapid progression of the condition. The decision to perform a surgical procedure to treat OA is usually taken considering the possible benefits and risks regarding each individual patient, especially in long term (Miettinen et al., 2021).

Active local or systemic infections, poor health conditions such as acute illness or multiple underlying diseases, challenging anatomy and obesity, unexplained hip pain, and in some cases, patient's inability to follow up postoperative recommendation and follow-ups are among the only contradictions to surgical interventions of OA (Goldberg, 2007, Schwartz & Della Valle, 2013, Manning et al, 2017).

Research shows that THA significantly improves patients' functionality, quality of life, and overall health, contributing to patients' independence (Laupacis et al., 1993, Towheed & Hochberg, 1996, Sato et al., 2020). Figure 3 shows a general illustration of materials used in hip surgeries, including two types of hip arthroplasties.

Figure 3. Explosion views of various types of hip arthroplasty. Park et al., 2023.

Possible complications and failure of THA

According to Cashman et al. (2013), intraoperative complications include vascular injuries (including frank and occult hemorrhage, thrombosis and embolism), peripheral nerve injuries, and periprosthetic fracture during the procedure.

It is noteworthy that the reason for THA can impact both short term postoperative complications and long-term rehabilitation process and challenges. Moreover, the survival of hip replacement surgery seems to be influenced by various patient related factors. In order to provide individualized care path, such risk factors for THA failure should be identified in patients and communicated to them.

Surgical procedures performed to treat hip trauma and fractures might have more impact on patients, due to systematic shock of the trauma events. Most common short-term complications for hip fractures include internal and external hemorrhage, electrolyte imbalance, and nerve injury. After a few days, post-operative infections (surgical site infections or deep infections), deep vein thrombosis, pulmonary embolism, prophylaxis, compartment syndrome, and pressure ulcers for immobile patients are among such procedures' complications. In the long term, joint stiffness, delayed bone union, malunion, and nonunion, complex regional pain syndrome, avascular necrosis, heterotopic ossification, and mechanical irritation or dislocation of prosthesis (Sheeraz, 2018).

Treatment of OA using THA usually means shorter hospitalization period and postoperative rehabilitation, and less comorbidities, comparing to THA patients who underwent surgery because of femoral neck fractures, however fracture patients might report the surgery outcome more positively, possibly because of more significant paint and limitations due to fractures (Stirton, 2019). Among the surgical options for managing hip fractures "THA is reserved for cognitively lucid, community ambulators who are medically fit" (Stirton, 2019, p. 141).

Research also shows that young active male patients are considered high risk subgroup for THA failure and component loosening, possibly due to activities that put more amount of

stress on the joint (Jafari et al., 2013). It has been suggested that THA patients with better social support and better health conditions prior to surgery might experience better results (Jafari et al., 2013).

It is also important to consider the possible role of factors related to care institutions. THA operations performed within institutions with less volume and by less experienced surgeons, seem to have a higher mortality rate, infection rate, and complications. However, it is also possible that these occurrences are recorded less in high volume institutions because they tend to have shorter hospitalization periods (Kang et al., 2007, Virolainen, 2012).

Main reasons leading to consideration for revision THA include joint instability and dislocation, hardware loosening and joint infection (Jaffe et al., 2012, Fox et al., 2013, Levine, 2020). Moreover, common intraoperative complications of THA might be increased in revision THA due to altered anatomic landmarks including scar tissues (Cashman et al., 2013).

THA postoperative management and rehabilitation

The main objective of rehabilitation strategies after total Joint arthroplasty (TJA) is facilitating preparation for surgery and recovery (Manning et al., 2017). Fast discharge, avoiding and managing complications, and reducing the need for follow-up care are among the main goals of THA postoperative management (Manning et al., 2017, Karimijashni et al., 2023).

Enhanced Recovery After Surgery (ERAS) protocols, defined as "multi-disciplinary, peri- and post-operative approach performed to optimize patient's health condition, reduce surgical stress, and improve post-operative recovery" (Di Martino et al., 2023, p. 569) have become common practice in orthopedic surgical climate (Husted et al., 2010, Bassetty et al., 2022, Götz et al., 2022).

An important part of THA rehabilitating involves educating the patient and their family to make activities of daily living manageable. Such education might also be given to the patients preoperatively (prehabilitation), and sometimes in online or video form (Manning et al., 2017, Hines et al., 2019, Karimijashni et al., 2023).

Prehabilitation and rehabilitation strategies encompass a wide range of approaches aimed at assisting patients in restoring and preserving their physical, sensory, intellectual, psychological, and social functions (Karimijashni et al., 2023). The application of such rehabilitation strategies is done in multi-professional teams involving nurses, physiotherapists, occupational therapists etc., and it might happen either in outpatient or inpatient settings (Karimijashni et al., 2023). Postoperative physical rehabilitation of THA usually demands early mobilization, muscle activation, gait training and stair training (Hines et al., 2019, Kaufman, 2020).

Hip precautions

Hip precautions have been applied in the past for THA patients to avoid further complications and dislocation of the prosthetic joint; however, their use has been subjected to debate and controversy (John et al., 2019, Mandel et al., 2020). General hip precautions include avoiding hip flexion, hip adduction, and internal rotation for the first weeks of the posterolateral surgical approach, and avoiding excessive hip extension, external rotation or adduction for the anterolateral surgical approach (Manning et al., 2017, Hines et al., 2019, Kaufman, 2020).

New data shows that hip precautions don't contribute to any significant difference in prosthetic joint dislocation and discarding them can lead to more patient satisfaction and higher level of daily life activities (Peak et al., 2005, Restrepo et al., 2011, Rowan et al, 2018).

3 Pain Catastrophizing and Kinesiophobia

Pain catastrophizing and kinesiophobia are similar and overlapping concepts to a great extent, as they are both pain-induced avoidance behaviors. Such behaviors are generally believed to manifest in avoiding pain itself and avoiding painful activities. (Quartana et al., 2009) The main distinction between pain catastrophizing and kinesiophobia is that the former could be used to evaluate pain-induced avoidance, while the latter mainly focuses to avoidance behavior that is related to movement.

Pain catastrophizing is "broadly conceived as a set of exaggerated and negative cognitive and emotional schema brought to bear during actual or anticipated painful stimulation" (Quartana et al., 2009, p. 2). Pain catastrophizing is believed to affect pain intensity, emotional distress, level of mobility, more negative postoperative outcomes, and pain management challenges (Petrini & Lars Arendt-Nielsen, 2020).

According to Kori et al. (1990), kinesiophobia is an unfounded and incapacitating fear of physical movement, possibly affected by beliefs related to fragility and risk of injury.

Flanigan et al., (2015) hypothesizes these concepts in the context of orthopedics as follows:

> "In the orthopaedic setting, when patients experience recurrent pain with particular movements or activities, an exaggerated negative psychological response to pain or the anticipation of pain (ie, pain catastrophizing) may develop that leads to an active avoidance of movement out of fear of recurrent pain or injury (ie, kinesiophobia). In the postoperative setting, this persistent fear-avoidance behavior, despite surgical correction of the pain generator, may contribute to poor-quality rehabilitation that, in turn, may lead to insufficient improvement in symptoms." (p. 564)

The understanding of both concepts has developed in recent years. Pain catastrophizing is viewed more as a situation-specific response, rather than an inherent psychological trait (Quartana et al., 2009, Høvik et al., 2016). Kinesiophobia is also seen as a more complex phenomenon with possible socioeconomic and psychological roots (Knapik et al., 2011).

In the context of THA, fear of damaging joint protheses and pain infliction are among the limiting challenges THA patients report (Smith et al., 2015). Moreover, pain catastrophizing and preoperative mental health conditions seem to be the most significant factors affecting postoperative pain after THA (Pinto et al., 2013b). Kinesiophobia has been seen as a factor in avoidance of physical activities and reduction in daily life activities following THA (Trudelle-Jackson & Smith, 2004).

Among the tools used for assessing pain catastrophizing, Pain Catastrophizing Scale (PCS) developed by Sullivan et al. (1995) seems to be the most common one (Quartana et al., 2009). There are also various scales to provide a clinical measurement of kinesiophobia (Liu et al., 2021). Tampa Scale of Kinesiophobia (TSK) seems to be the most common tool (Bordeleau et al., 2021). It has been modified and applied to various contexts (Weermeijer & Meulders, 2018), including postoperative settings (Archer et al., 2012).

4 Aim and research question

The aim of the present thesis is to find out the effect of kinesiophobia and fear catastrophizing on THA patients and find out possible related nursing role. In order to do so, existing research is analyzed to find out related information and the results are discussed combined with evidence-based practice. The present study's research question can be summarized this way: what is the significance of pain catastrophizing and kinesiophobia for THA patients (i.e. how if affect them?), and what are the possible interventions and management principles that can be considered for it in the context of THA perioperative management (i.e. what can be done about them?)

Research question:

- What is nursing role related to kinesiophobia and pain catastrophizing in patients who undergo THA?

Purpose of the study:

- Providing a narrative based on current evidence-based data on the importance of pain catastrophizing and kinesiophobia on THA patient outcomes, in easily accessible form for the nurses, and contributing to improvements in related nursing care.

5 Methodology

Literature review

Literature reviews are extensively employed in research and hold significant value as they try to consolidate all the existing research in a specific field. By meticulously curating and summarizing relevant papers, literature reviews alleviate the burden of individuals having to read every publication on a given topic. Most literature reviews are designed to use a clear question, a clear search strategy, and proper analysis of the gathered data (Aveyard et al., 2023). There are multiple forms of literature review, for example scoping, focused mapping review and synthesis, meta-analysis, integrative review, systematic review, umbrella review etc. (Aveyard et al., 2023).

Souza et al. (2012) emphasized that integrative review has emerged as a distinctive healthcare tool for consolidating available research on a specific topic and guiding practice based on scientific knowledge, due to importance of evidence-based care practice. Despite the complexity and challenges associated with integrating data from studies with diverse designs, conducting an integrative review with a systematic and rigorous approach, especially in data analysis, leads to minimized biases and errors. According to Aveyard et al. (2023), integrative literature reviews can be beneficial if the focus of research is not limited to only quantitative or qualitative methods.

The phases of integrative review include preparing the research question, literature search, data collection, critical analysis of the selected data, discussion of the results, and presentation of the integrative review (Souza et al., 2010).

Literature search

Literature and source search to perform integrative review should be broad, using various sources like electronic databases. Ideally, all the research found, or a randomized sample of sources can be selected. In some cases, the possible resources and scope of the research might not permit such a broad and extensive approach, in which case, inclusion and exclusion criteria can be applied in order to narrow down the results into a feasible scale. The inclusion and exclusion criteria should be in line with the research question (Souza et al., 2001).

According to Van de Voorde & Léonard (2007), it must be ensured that the literature search is adequately documented to facilitate replicating the search. Such documentation usually consists of details such as the databases that were searched through, the specific time range that was selected, and any additional criteria, such as language or research area.

As stated before, the purpose of this thesis is to investigate the significance of kinesiophobia and fear catastrophizing in patients who undergo THA, in order to understand nurses' role in preoperative settings. Therefore, the keywords used in this search was divided into two different categories: THA and kiensiophobia. Boolean search phrases were used include different terminology that may be used in literature: ("total hip arthroplasty" OR "hip replacement" OR "hip arthroplasty" OR "hip joint replacement" OR "total hip replacement" OR THA OR THR) AND (kinesiophobia OR "fear of movement" OR "pain catastrophizing" OR "movement phobia" OR "activity avoidance" OR "movement fear"). The literature search was done using CINAHL Ultimate and PubMed databases.

Initially, a search term category related to nursing role was considered, but inclusion of such keyword didn't provide relevant enough information, therefore it was decided to discard this category. Table 1 shows the search components and the terms chosen for each one.

THA	total hip arthroplasty, hip replacement, hip arthroplasty, hip joint replacement, total hip replacement, THA and THR
Kinesiophobia and pain catastrophizing	Kinesiophobia, fear of movement, pain catastrophizing, movement phobia, activity avoidance, movement fear

Table 1. Literature search components

The initial search provided 363 titles in CINAHL and 38 titles in PubMed. In order to narrow down the search to find more relative data proper to scope of the study, multiple inclusion criteria were chosen. Table 2 contains the inclusion criteria.

Inclusion criteria
- English language
- Full text articles available for JAMK students
- Articles published from 2013 onwards
- Articles that are related to the research question
- Adult patients
- Evidence-based research

Table 2. Inclusion criteria

After applying the inclusion criteria, the search results were narrowed down to 26 titles from CINAHL and 20 titles from PubMed. Finally, after examining the abstracts of the remaining titles, 12 titles were selected as research data. Table 3 shows the search process.

Database	**Results for initial search**	**Results after applying inclusion criteria**	**Final results, after examining the abstracts**
PubMed	363	20	12

CINAHL	38	26	0

Table 3. Literature search narrowing process

The selected articles were appraised using CASP checklists for research appraisal. The selected data for the present thesis, by design, incorporate various range of research types, including an umbrella review of systematic reviews and meta-analyses, a systematic review and meta-analysis, controlled trials, cohort studies, and secondary analysis from larger sets of data. A summary of the selected titles, their aims, methodology, findings, and limitations can be found in appendix 1. Table 4 demonstrates the PICOS table used to define the aim of the present thesis.

Population	Pain catastrophizing and kinesiophobia in THA patients
Interest	Its effect on patient outcomes and possible nursing interventions and management strategies
Context	Perioperative nursing, rehabilitation setting.
Study design	Integrated review, using EB research from last 10 years that is accessible for JAMK students

Table 4. PICOS table of the study

Data Analysis

An analysis method of data for integrative review depends greatly on the research question and nature of study aim. Considering the various aspects of the research question, a

mixed-method approach using a Framework Method thematic analysis was chosen for this study.

Combining quantitative and qualitative research approaches in the context of applied research such as health care and nursing can help to have a better understanding of complex human behavior (Johnson & Onwuegbuzie, 2004), especially considering behaviors that might have social aspects (Morse & Field, 1995). Using qualitative methods can also help researchers to contextualize quantitative findings in the real world, providing insights into the meanings, interpretations, and social dynamics underlying quantitative outcomes. In other words, they can be tools to interpret social and cultural factors that are researched quantitively (Flick, 2014, Creswell & Clark, 2017). Moreover, mixed method research can also be beneficial in researching specific interventions, as they can help better understand "not only whether a novel intervention works, but also how and why, or why not" (Fetters & Molina-Azorin, 2020, p. 141)

According to Vaismoradi & Turunen (2013), thematic analysis is an autonomous qualitative descriptive method that aims to identify patterns and themes within data, making it applicable to various epistemologies and research inquiries. It is generally applied to analyze qualitative data, such as interviews, but its application on other types of data can also be beneficial (Braun & Clarke, 2022). This approach involves the systematic identification, analysis, organization, description, and reporting of themes discovered within a given data set (Vaismoradi & Turunen, 2013, Purssell & Gould, 2021). Nowel et al. (2017) emphasizes that thematic analysis offers a remarkably adaptable approach due to its theoretical flexibility, allowing it to be tailored to suit the requirements of various studies. This method provides a comprehensive and intricate understanding of data, albeit with a certain level of complexity.

Among various types of thematic analysis, Framework Method was selected as the basis method for the present study, as it provides a tool to apply the findings to existing knowledge and practice, which can be of great benefit in health care research (Gale et al.,

2013). This basis method was modified to some degree in order to use it for the specific set of data. Steps of a usual Framework Method thematic analysis include transcription, familiarization with the data, developing a working analytical framework, coding, applying the analytical framework, charting data into the framework matrix, and interpreting the data (Gale et al., 2013). These steps were modified as follows, to adapt the method to specific approach and data set of the present study: accumulation of the data in form of text, familiarization, developing a working analytical framework, coding, applying the analytical framework, organizing the data, and interpreting the data.

The working analytical framework of this study is basic principles of THA perioperative management. A few relevant themes (or "codes") were developed to further develop the analytical framework. Figure 4 illustrates the developed themes.

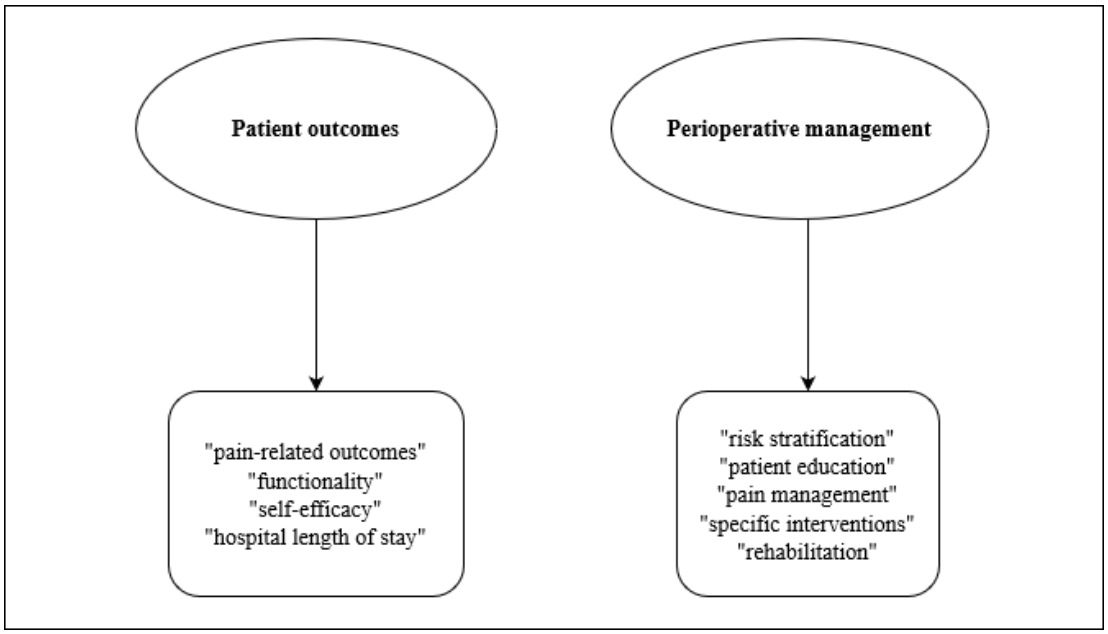

Figure 4. Themes developed for the data analysis

The data was coded and analyzed using the developed themes, to deductively find out meaningful connections in the context of the issue of interest. Figure 5 shows an example of such deductive data analysis process. After organizing the found themes and results, it

was tried to interpret the findings in a critical and reflective way and provide a narrative that could be used in evidence-based practice.

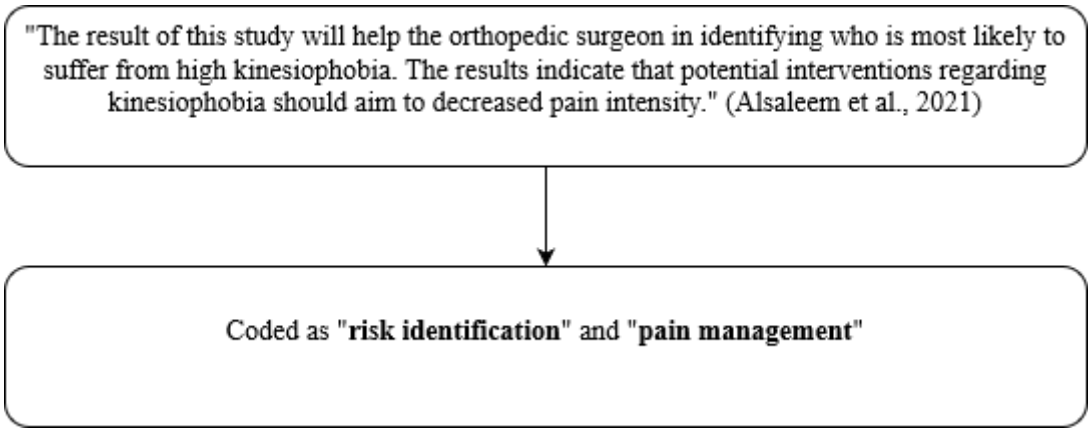

Figure 5. An example of the coding process.

6 Results

Prevalence and significance

Pain catastrophizing and kinesiophobia can be significant for patient outcomes, especially on physical activity and various pain-related outcomes. In an umbrella review of systematic reviews and meta-analyses about prognostic factors of chronic postoperative pain in hip and knee replacement patients with OA, Fernández-de-Las-Peñas et al. (2023) found several factors that show a high association with postoperative chronic pain after THA, including sociodemographic, psychological and cognitive factors such as kinesiophobia, pain catastrophizing, social support, mental health, depression, anxiety, coping strategies, etc. THA patients show high prevalence of kinesiophobia which directly correlates with pain intensity (Alsaleem et al., 2021). Postoperative elevations in depressive symptoms and pain catastrophizing, regardless of when it occurs, are associated with persistent pain after TJA (Hah et al., 2023).

Olsson et al. (2016) demonstrated that a considerable proportion of patients scheduled for THA exhibited low general self-efficacy (GSES) and high kinesiophobia, as indicated by

high TSK scores. Approximately 30% of patients had low GSES, while around 50% had high TSK scores. The length of stay for patients with low GSES and high TSK scores was found to be potentially influenced. This suggests that a lack of self-efficacy and/or a heightened fear of movement may disrupt the rehabilitation process following THA surgery.

The relationship between reduction in pain catastrophizing and physical performance during the initial phase after THA and total knee arthroplasty (TKA) was examined by Hayashi et al. (2017). The results revealed a significant association between changes in pain catastrophizing and physical performance in the early period after TKA. Moreover, Morri et al. (2020) didn't find a correlation between early functional performance and kinesiophobia levels in THA patients. They also found that in patients undergoing knee replacement surgery, kinesiophobia appears to be equally intense as in individuals with hip OA, but with a higher frequency. They argued that this observation may help explain the varying impact of kinesiophobia on postoperative recovery between these two patient groups. It is likely that fear of movement mechanisms, which are more prevalent in knee replacement patients, contributes to the association between joint function and kinesiophobia levels. In the case of THA patients, fear of movement appears to play a significant role in the deterioration of function, but it is not directly linked to preoperative pain symptoms (Morri et al., 2020).

Higher pain intensity, difficulties in walking, and kinesiophobia seem to be associated with an increased likelihood of patients being willing to undergo surgery. In their analysis of a larger randomized controlled trial, Dell'Isola et al. (2021) concluded that both THA and TKA patients who experienced higher levels of pain, kinesiophobia, and walking difficulties at the 3-month mark had a greater likelihood of being willing to undergo surgery at that time. In contrast, individuals who exhibited higher levels of self-efficacy at the 3-month mark had a lower likelihood of expressing willingness to undergo surgery. Similarly, regardless of the joint affected, patients with higher levels of pain, kinesiophobia,

and walking difficulties at the 12-month mark had a higher likelihood of expressing willingness to undergo surgery at that time. Conversely, having higher levels of self-efficacy and quality of life at the 12-month mark was associated with a lower likelihood of expressing willingness to undergo surgery.

On the other hand, Hidaka et al., (2023) didn't find a significant association between kinesiophobia and pain intensity, while both pain catastrophizing and kinesiophobia were found related to quality of life, indicating that treatment of pain doesn't necessarily affect kinesiophobia.

Kinesiophobia was also found to be prevalent 6-8 years after THA with a negative impact on functional outcome and quality of life, as well as an increased likelihood of using walking aids and experiencing postoperative adverse events, suggesting that kinesiophobia may be an important but overlooked factor contributing to poor outcomes following THA (Al-Amiry et al., 2022).

THA and TKA patients experience similar levels of kinesiophobia, while it seems that TKA patients experience it more frequently (Morri et al., 2020). Moreover, Hayashi et al. (2017) found out that " changes in pain catastrophizing significantly associated with changes in physical performance in the early period after TKA, but not after THA" (p. 339) This might mean that pain-related disability and lack of function might be resolved in less than two weeks after THA. A significant implication of these findings is that in some people, kinesiophobia in THA patients might be a temporary response to the surgery. This is also suggested in the findings of Hah et al., (2023) about pain catastrophizing.

Moreover, there seems to be an association between poor sleep in OA patients before surgery and preoperative pain intensity, pain catastrophizing, anxiety and depression (Boye Larsen et al., 2021).

Interventions and management strategies

Most of the data articles emphasized the importance of perioperative risk stratification and pain education by investigating the prevalence and impact of pain catastrophizing and kinesiophobia and reflecting on the findings. Three of the data articles investigated the results of specific interventions:

Eren et al. (2022) examined the impact of a discharge education program utilizing video assistance and a physiotherapy program on the activities of daily living, functionality, and patient satisfaction for patients and their relatives after THA. The video-assisted discharge education program was found to effectively decrease pain perception and kinesiophobia, enhance hip function, and increase patient satisfaction. Furthermore, the video-assisted discharge education program and the physiotherapy program yielded similar outcomes in daily activities.

In a randomized controlled trial of 224 patients from different centers, Smith et al. (2022) concluded that inclusion of a group-based behavior change to a standard physiotherapy rehabilitation, does not provide any advantages compared to the standard physiotherapy alone, in terms of physical activity and clinical outcomes during the initial 12 months after primary THA and TKA.

Olsson et al. (2016) also investigated the effect of a person-centered health approach towards THA perioperative care and found out it can be more effective than standard care. It seems that providing individual support and attention could help to reduce patients' hospitalization periods. Table 4 shows an overview of interventions and strategies extracted from the data articles.

Intervention and strategies
• Perioperative risk stratification   o Scales such as TSK and PSC • Patient education • Pain management preparation • Patient-centered approach • Cognitive-behavioral interventions

Table 5. interventions and strategies

7 Discussions

Patient outcomes

Research has shown that pain catastrophizing and kinesiophobia can be an important factor when it comes to various outcome components of THA, such as functionality (Olsson et al., 2016, Morri et al., 2020, Niederstrasser & Cook, 2020, Petrini & Arendt-Nielsen, 2020, Alsaleem et al., 2021) and postoperative pain related complications (Theunissen et al., 2012, Pinto et al., 2013a, Sobol-Kwapinska et al., 2016, Luque-Suarez et al., 2019, Niederstrasser & Cook, 2020, Fernández-de-Las-Peñas et al., 2023, Hah et al., 2023). Patients' functional outcome and quality of life might be affected by kinesiophobia even years after the surgery (Al-Amiry et al., 2022). However, the results still seem to be controversial and unclear (Hidaka et al., 2023).

It seems that pain catastrophizing has been used more than kinesiophobia in the context of orthopedic management (Flanigan et al., 2015) This is apparently due to the importance of pain resolution and management in postoperative settings. However, there is a compelling argument to shift the focus to kinesiophobia for patients, especially in postoperative phase, as fear of movement might be a temporary response to surgery (Morri et al., 2020, Hah et al., 2023). Kinesiophobia appears to play a significant part in the deterioration of functionality, even though it might not be directly linked to preoperative pain symptoms

(Morri et al., 2020). This might mean that pain management measures might not be enough to reduce kinesiophobia and promote postoperative rehabilitation.

Pain affects all aspects of OA patients, including psychological wellbeing and might lead to avoidance behavior (Hurley et al., 2018, Lentz at al., 2020). Beliefs about pain can be a predictor for impairment, pain severity and functional challenges in OA patients (Jia & Jackson, 2016, Hurley et al., 2018). Patients' reports show that insufficient and inconsistent information about physical activity and fear of damaging the joint are among the challenges to perform physical activities in THA patients (Smith et al., 2015). It can be argued that one mechanism of kinesiophobia affecting THA postoperative outcomes regardless of pain tensity, is possibly failure to comply to early mobilization, which has shown to be an important predictor in hospital length of stay and recovery progress (Olsson et al., 2016). In other so, failure in early mobilization after THA might sometimes happen due to lack of knowledge and education, especially related to surgery.

Risk stratification and patient education

Perioperative risk stratification and patient education seem to be the golden rules of addressing kinesiophobia in THA preoperative settings. Identifying high-risk patients is very important in THA care, regarding both pain (Hayashi et al., 2017, Alsaleem et al., 2021, Fernández-de-las-Peñas et al., 2023, Hah et al., 2023) and function (Fernández-de-las-Peñas et al., 2023, Hidaka et al., 2023).

TSK was evaluated as a helpful instrument to quantify kinesiophobia both preoperatively and postoperative results (Olsson et al., 2016, Hayashi et al., 2017). This is in line with literature that shows understanding of patients' pain experiences through validated measuring instruments could be beneficial in optimizing patients' care (Khan et al., 2011). It could be argued that using task-specific image and video education might show additional bene-

fits than more general instruments such as TSK (Tissot et al., 2023), especially in the context of goal-oriented early postoperative mobilization of THA. Hah et al. (2023) emphasizes that such screenings are helpful both preoperatively and postoperatively, due to the possibility of their emergence in response to surgery.

Hip precautions have been a controversial issue in THA rehabilitation, due to possible risks such as prothesis dislocation and loosening (Mandel et al., 2020). There seems to be a dialectic of shifting towards individualized care, using more comprehensive pain education, physical activity education and prehabilitation and shared decision-making with patients to achieve better patient outcomes and satisfaction. Olsson et al. (2016) has shown the effectiveness of person-centered care in THA perioperative settings regarding kinesiophobia, which is line with the basic principle of optimizing perioperative according to each patient's needs and individual characteristic and circumstances. Individual support and attention and shared decision-making can help patients navigate through challenging postoperative recovery (Olsson et al., 2016). Providing consistent and comprehensive information about the surgical procedure, potential risks and complications, pain management strategies, and rehabilitation exercises can lead to better patient outcomes and satisfaction (Eren et al., 2022). Care plan optimization and patient education can be beneficial in various forms, including telecare interventions (Scott et al., 2016), virtual reality technology (Wang et al., 2023), video-assisted discharge education and educational booklets (Eren et al., 2022).

When it comes to specific interventions that might be helpful for decreasing kinesiophobia, cognitive-behavioral interventions (Quartana et al., 2009, Ikemoto et al., 2015, Hayashi et al., 2017, Cai et al., 2018, Schatman & Levin, 2024) Moreover, pain neuroscience education seem to be beneficial for chronic pain rehabilitation and pain management (Louw et al., 2016, Murillo et al., 2023), in postoperative settings (Machado et al., 2023) and is shown to help reduce kinesiophobia in knee OA patients (Modaressi et al., 2023). However, not all educational or psychological interventions lead to significant outcome change

in pain catastrophizing and there is need for further research on effect of specific interventions and approaches towards these phenomena (Gibson & Sabo, 2018).

Future research and conceptualization

There is need for further research and efforts to theorize and conceptualize fear-related behavior (Lundberg et al., 2009, Petrini & Arendt-Nielsen, 2020) in various settings, including related to surgical interventions. Research on both kinesiophobia and pain catastrophizing have been done for a wide range of patients, including dental patients (Lin, 2013), Fibromyalgia (Izquierdo-Alventosa et al., 2020), chronic heart failure (Qin et al., 2022), Parkinson's disease (Jiménez-Cebrián et al., 2021), traumatic lower extremity amputation (Örücü Atar et al., 2022) etc. Research on kinseiophobia has significantly increased since 2020 (Li et al., 2023). Moreover, although in quite a different context than THA perioperative setting, transitory kinesiphobia in patients of sport-related concussion have been studies (Reinking et al., 2021).

There seems to be a knowledge gap about generalizability and reproducibility of some interventions that have shown to be effective (Gibson & Sabo (2018). Investigating the same interventions and management protocols for different patient groups or across different care centers and comparing effects of different interventions could provide insight on how to address the related challenges.

It is also important to consider critique of pain catastrophizing as a concept and a health-related term. Many chronic pain patients see "pain catastrophizing" as a problematic term (Webster et al., 2022), and believe that it suggests they report their pain in an exaggerated way (Buchman et al., 2017). After all, there is a history of underdiagnosis of conditions such as fibromyalgia and endometriosis, possibly due to disregarding patients' pain among other reasons (Hudson, 2022). Interpreting PCS results as exaggerated pain report is a medical error, as "it assesses the tendency to exaggerate the 'threat value' of one's pain

symptoms" (Sullivan & Tripp, 2023, p. 10). There have been efforts to reconceptualize and rename this concept, for example to "catastrophic worry" (Flink et al., 2013). It is also noteworthy that assessment of threat value of pain perception using PCS might not lead to valid observation. It difficult to assess the possible exaggeration in pain threat perception, in absence of an external referent of such threat (Crombez et al., 2020). In such context, positive empathetic validation in interpersonal connections between health care personnel and patients is very beneficial (Boersma et al., 2019).

Better understanding of pain is imperative for such research and conceptualization effort. Pain is a complex and multifaceted phenomenon which might not have the same significance for different people across different cultures and populations (Peacock & Patel, 2008, Hobara, 2012, Krupić et al., 2018, Meints et al., 2019). Moreover, in an increasingly multicultural setting of health care where pain might be seen as fifth vital sign, considering cultural significances and complexities (Leijen & van Herk, 2021), such as possible cultural variations and nuances regarding beliefs towards pain (Callister 2003, Lovering 2006, Peacock & Patel, 2008, Ferreira-Valente et al., 2023) is very important when it comes to research and practice. Moreover, there are also indications that geographic and socioeconomic background could be a factor for OA prevalence (Callahan et al., 2020) and THA outcomes (Oldsberg et al., 2019, Krupic et al., 2024).

Reflections, validity and reliability

The present study tried to investigate literature and provide a critical narrative of kinesiophobia's significance in THA postoperative settings with both ontological and pragmatic views. However, health care practice requires a phenomenological approach as well. Results related to patient-reported outcomes have been among the dataset for this thesis, however, using a more phenomenological approach such as focus on patients' interviews can help to utilize their views also while conceptualizing kinesiophobia.

The methodology of the present thesis is somewhat unorthodox, due to using a mainly qualitative method on results of mainly quantitative data. This was due to the effort to approach a phenomenon of complex nature and its application in practice. Such a method would have been potentially more useful if there were also qualitative data in the selected dataset. To ensure validity and reliability of study design, methodology and its results, the general suggestions and recommendations of Braun & Clarke (2022) were considered while developing the method. Moreover, various CASP checklists were used for critical appraisal of the data articles.

This study didn't take nursing theory into account. Investigating the issue of interest through lenses of nursing theory could help better understand nursing's role in its management. For instance, Betty Neuman's Systems Model (1989) focuses on individuals' responses to stressors and Hildegard Peplau's Interpersonal Relations Theory (1997) emphasizes the interpersonal relationship and role of trust and collaboration between patients and nurses, which could be insightful in the context of this study's topic.

Ethical Considerations

To the extent of knowledge of the author, the present study and the data articles used in it adhere to JAMK's ethical guidelines.

Core tips:
• Pain catastrophizing and kinesiophobia seems to be associated with pain and recovery related outcomes. They can both create challenges for postoperative rehabilitation. • Further research and conceptualization needed. • Kinesiophobia seems to be sometimes a temporary response to surgery that might re-solve shortly some weeks after surgery. • Perioperative risk stratification and preparation, proper patient education about risks, pain, recovery and rehabilitation are beneficial and important. • Individualized care planning using a patient-centered approach and shared decision-making seem to be beneficial. • Cognitive-behavioral interventions and neuroscience pain education seem to be helpful.

Table 6. Core tips

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Appendices

Appendix 1. Articles selected as thesis data

Authors and publication year	Title	Study purpose	Methodology	Findings	Critical appraisal (CASP)
Hidaka at al., (2023)	Association of high kinesiophobia and pain catastrophizing with quality of life in severe hip osteoarthritis: a cross-sectional study	Studying association between kinesiophobia and pain catastrophizing with quality of life in hip OA patients.	Cross-sectional study of 91 patients with severe hip OA scheduled for primary unilateral THA, using multivariate analysis of patients' TSK, PCS, and EuroQOL-5 Dimensions, and Japanese Orthopaedic Association Hip Disease Evaluation Questionnaire.	High pain catastrophizing was correlated with the disease specific QOL scale. High pain catastrophizing, pain intensity, and high kinesiophobia were independently correlated with the general QOL scale.	Moderate to High. Small number of patients from one facility. Other psychological factors were not evaluated. JHEQ is designed for Japan and the results might not be applicable to other cultures.
Boye Larsen et al., (2021).	The association between sleep quality, preoperative risk factors for chronic postoperative pain and postoperative pain intensity 12 months after	Studying the relationship between preoperative sleep quality, clinical pain intensity, pain catastrophizing, anxiety and depression, and their connection with chronic	Secondary analysis from a larger randomized controlled trial included rest pain intensity before the surgery and a year after	Patients with poor preoperative sleep quality show higher preoperative pain, pain catastrophizing, anxiety, and depression. Higher chronic postop pain intensity was associated with high preopertive pain intensity, but not	High. Significance decrease from the primary trial. The primary trial has excluded patients who used antidepressants and anxiolytics within the past 4 weeks

	knee and hip arthroplasty	postop pain after THA and TKA.		with poor sleep quality.	
Hayashi et al., (2017)	Associations among pain catastrophizing, muscle strength, and physical performance after total knee and hip arthroplasty	Investigating association between pain catastrophizing with physical performance in early period following TKA and THA	Clinical trial of 46 who were evaluated 7 days before and 14 days after surgery, using Timed Up and Go test, 10 minute gait observation, VAS and Pain Catastrophizing Scale	Changes in pain catastrophizing were significantly associated with physical performance in the early period after TKA	Result might not be generaizable due to small number of participant from one facility
Olsson et al. (2016)	Evaluation of person-centred care after hip replacement-a controlled before and after study on the effects of fear of movement and self-efficacy compared to standard care	Identifying vulnerable and anxious THA patients using general self-efficacy scale (GSES) and TSK, and evaluating if person-centred care contributed to shorter hospital stays and more effective rehabilitation.	Quasi-experimental trial of 266 patients from two Swedish orthopaedic departments	The GSES and TSK were useful to detect vulnerable patients The patients with impaired health can get the most benefits from person-centered care.	High. Not possible to differentiate between effects of the specific intervention with other possible factors, due to study design.
Morri et al., (2020).	Is kinesiophobia a predictor of early functional performance after total hip replacement? A prospective	Studying possible predictors of early functional performance after THA, and describing main characteristics of	Prospective-prognostic cohort study of 269 THA patients	Early functional performance after THA was not correlated with preoperative kinesiophobia. Patients with high kinesiophobia preoperatively might	Comorbidities were not evaluated preoperatively. Results include patients from one facility. Only about

	prognostic cohort study	patients with high kenisiophobia		achieve less functional ability.	the early functional recovery.
Eren at al. (2022)	The effect of video-assisted discharge education after total hip replacement surgery: a randomized controlled study	Studying the effect of a video-assisted discharge education program on THA patients' daily life activities, functionality, and patient satisfaction	Randomized controlled trial of 31 patients aged 25-70 in two hospitals in Turkey.	Video-assisted discharge education and education booklets tailored individually for THA patients helped to reduce pain levels and kinesiophobia and increased functionality and patient satisfaction	High. No examination of patients prior to surgery; long-term outcomes not investigated.
Al-Amiry et al., (2022)	Kinesiophobia and its association with functional outcome and quality of life 6-8 years after total hip arthroplasty	Investigating incidence and severity of kinesiophobia, and to determine the relationship between Tampa Scale of Kinesiophobia scores, functional outcome and quality of life 6-8 years after THA.	Descriptive analysis of Western Ontario and McMaster Universities Osteoarthritis (WOMAC) and EQ-5D scores before THA, and 6-8 years after THA (plus Tampa Scale of Kinesiophobia), from 161 patients.	High incidence of kinesiophobia 6-8 years after surgery. Treating kinesiophobia early on postoperatively might provide positive results.	High. TSK wasn't evaluated preoperatively. The population consisted of only symptomatic unilateral hip OA, therefore, might not be generalized to all OA patients.
Alsaleem et al., (2021)	Kinesiophobia Post Total Hip Arthroplasty: A Retrospective Study	Studying kinesiophobia and pain catastrophizing following THA in	Cross-sectional study of 74 THA patients of age group 18-75, using Tampa Scale of Ki-	High prevalence of kinesiophobia among THA patients. Kinesio-	Moderate/High. Possible selection bias due to inclusion/exclusion criteria. No co-morbidiy of specific

		King Fahad Hospital in Saudi Arabia	nesiophobia, processed using descriptive analysis.	phobia was directly correlated to pain intensity.	pain site was recorded. Result might not be generalizable due to patients being operated by group of experienced surgeons.
Hah et al., (2023)	Preoperative Versus Perioperative Risk Factors for Delayed Pain and Opioid Cessation After Total Joint Arthroplasty: A Prospective Cohort Study	Identifying risk factors of delayed postoperative opioid cessation and pain resolution after THA and TKA. And preoperative versus perioperative factors associated with delayed with them, including long term changes in psychological distress.	A prospective cohort of 188 THA or TKA patients using continuous postoperative evolutions.	Postoperative increase in depressive symptoms and pain catastrophizing are associated with persistent pain after TJA. Targeted interventions targeting might help.	Moderate to high. Lack of causality for correlations due to observational design.
Fernández-de-las-Peñas et al., (2023).	Prognostic Factors for Postoperative Chronic Pain after Knee or Hip Replacement in Patients with Knee or Hip Osteoarthritis: An Umbrella Review	Investigating existing evidence on prognostic factors of postoperative pain after TKA and THA.	An umbrella review of systematic reviews and meta-analyses about postoperative chronic pain at least 6 month after surgery	Multiple preoperative factors (i.e., sociodemographic, clinical/sensory, or psychological/cognitive) found associated with postoperative chronic pain after knee or hip replacement	High. heterogeneity of the included systematic reviews in the follow-up periods. High rate of bias for the included reviews.

Smith et al. (2022)	Randomised controlled trial of a behaviour change physiotherapy intervention to increase physical activity following hip and knee replacement: the PEP-TALK trial	Comparing usual physiotherapy to behavior change physiotherapy intervention to promote physical activity after THA and TKA.	Multicenter randomized controlled superiority trial of 224 patients	No difference between the two types of physiotherapy was found.	Moderate to High. Unable to reach the desired sample size. Results probably affected by COVID-19 pandemic.
Dell'Isola et al. (2021)	Willingness to Undergo Joint Surgery Following a First-Line Intervention for Osteoarthritis: Data from the Better Management of People with Osteoarthritis Register	Studying the number of participants reconsidering their willingness for surgery after 3 and 12 months. And comparing the characteristics of willing and unwilling patients before a first-line intervention, and association between pain intensity, walking difficulties, self-efficacy, and kinesiophobia with willingness to surgery.	Observational study based on Swedish register data, including 30,578 individuals with knee or hip OA who received a first-line intervention including education and exercise.	A first-line intervention for OA is associated with reduced willingness for surgery, a greater number for knee OA than hip.	High. The effect of the treatment on the willingness for surgery cannot be established due to study design. Limited information about stage of disease. Doesn't address the complexity of willingness and decision-making for surgery.

Appendix 2. Abbreviations

ERAS	Enhanced Recovery After Surgery
GSES	General Self-Efficacy Scale
NSAID	Nonsteroidal anti-inflammatory drug
OA	Osteoarthritis
PCS	Pain Catastrophizing Scale
PTOA	Post-traumatic Osteoarthritis
THA	Total Hip Arthroplasty
TJA	Total Joint Arthroplasty
TKA	Total Knee Arthroplasty
TSK	Tampa Scale of Kinesiophobia