Managing Pain in Hip Fracture Patients

Effective Non-pharmacological Hip Fracture Pain Management Strategies in Nursing:

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Description

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Abstract

Pain is a prevalent varied concept that has different meanings in different cultures. Inadequate pain management, and hip fractures among the elderly, can significantly increase the risk of delirium, mortality, and morbidity within a year of the incident. The World Health Organization (WHO) categorizes pain into separate sorts, nociceptive pain which comes from actual or perceived damage to non-neural tissue, and neuropathic pain stemming from damage or malfunction in the nervous system.

Pain assessment is naturally subjective, relying on the individual's self-assessment. To provide effective healing and handling of pain requires a comprehensive understanding of its complexities and a varied methodology requiring a wide range of knowledge. This research plan is a literature review exploring postoperative hip pain in elderly hip fracture patients, aiming to create awareness, bring a fresh perspective on postoperative pain, and explore different non-pharmacological methodologies to manage hip fracture pain alongside opioids.

The research question guiding this study aims to shed more light on nonpharmacological post-operative hip fracture pain management. This study can be used by students, healthcare professionals, and any individual interested in nonpharmacological hip fracture pain management.

The literature review was selected as a method of study. The following databases were used to conduct the search CINAHL, PubMed, Google Scholar, and Medline (EBSCO).

Keywords(subjects)

Nociceptive pain, Neuropathic pain, Hyperpathia, Hypoesthesia, Hyperalgesia

Miscellaneous (Confidential information)

Acronyms

NOM – Non-operative management

NRS - Numerical Rating Scale

VRS – Verbal Rating System

THL - The Finnish Institute for Health and Welfare

NMDA - Nmethyldaspartate

IASP - International Association for the Study of Pain

VAS – Visual analog scale

NSAIDs – Nonsteroidal Anti-Inflammatory Drugs

WHO – World Health Organization

CBT - cognitive behavioral therapy

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1 Background

1.1 Introduction

Woolfe (2010) asserts that pain is a complex subjective sensation encompassing sensory and emotional aspects. A widely accepted definition characterizes it as an unpleasant sensory and emotional encounter linked to real or potential tissue injury. The function of pain lies in its role as a protective mechanism, heightening awareness of potential harm and encouraging behaviors that mitigate further injury (Small & Laycock, 2020). Additionally, pain can endure beyond the initial injury's resolution.

The World Health Organization (2016) maintains that pain is a multifaceted phenomenon, and its classification falls into distinct types based on various criteria. One common perspective distinguishes between nociceptive pain and neuropathic pain: Nociceptive pain: This type of pain comes from actual or perceived damage to non-neural tissue, such as muscles, organs, or skin (Coughlan et al. 2013). Nociceptive pain is often a result of inflammation or physical injury, and its usual definition is a sharp, aching, or throbbing sensation (Stanford Health Care, 2021).

Neuropathic pain: Neuropathic pain stems from damage or malfunction in the nervous system itself (Mäkitie et al. 2024). The causes include conditions such as nerve compression, diabetes, or infections. Neuropathic pain is often described as burning, and tingling, and can be chronic (WHO, 2016).

According to the Finnish population survey, 35% of adults had experienced pain lasting at least three months; the prevalence of daily long-lasting pain was 14% in Finland, research shows that pain is associated with about 40% of those who seek medical attention. Small & Laycock (2020) illustrates the total costs caused by pain include indirect costs, such as absence from work and reduced functional capacity.

Pain perception involves a complex interplay of sensory and emotional processing in the brain and nervous system (Boreski et al. 2014). Influences vary between factors, including psychological, cultural, and contextual elements. Typically, pain assessment is subjective; relying on the individual's self-report, as there is no direct objective measure of pain (Chan & Chan, 2022). Pain is always a subjective experience, the definition of pain

does not require tissue damage, but if the patient describes it as pain, consider that it is painful (Cimas et al. 2018).

Davis (2000) debates that to treat and manage pain better it is essential to comprehend what pain is and how complex it is depending on different scenarios. In the examination phase, and the making of the care plan, we should involve a wide range of knowledge and a multifaceted approach (Stanford Health Care, 2021). The purpose of pain is that it serves as a protective mechanism, sensitizing the body to potential harm and promoting behaviors that help prevent further injury; it can also persist long after the initial injury has healed (Woolfe 2010).

Unneby et al. (2023) discusses that the most frequent cause of an elderly patient's admission to an acute orthopedic ward is hip fracture, which also happens to be the most resource-demanding condition for orthopedic and trauma units (Tiihonen et al. 2022). Therefore, from a clinical and socioeconomic perspective, the development of therapy and rehabilitation is crucial (Mäkitie et al. 2024). Hip fractures are a common occurrence globally, especially among the elderly, and it is frequently linked to preoperative pain. Due to multiple diseases and aging, conventional pain relief can be a challenge.

This research project is a literature review exploring postoperative hip pain in elderly hip fracture patients. This study's aim is to create awareness on the use of non-pharmacological methods to manage postoperative hip fracture pain in elderly patients. This research is useful to novice nurses and experienced nurses. The research question is what non-pharmacological pain management interventions can be used alongside opioid treatment?

2 Pain Assessment

2.1 What is Pain assessment?

Urman et al. (2013) assures that the significant goal of pain assessment is to determine the best course of action for medical care, be it pharmacological treatment or non-pharmacological intervention. Consider assessing the characteristics of the type of pain before and after pain relief is administered (Magee, 2014). The aim is to ensure that the

patient will be free of pain or will experience minimal pain after analgesic or non-pharmacological treatment. To determine the intensity or the level of pain, a numeric rating scale or the visual analog scale can be used as alternatives.

As per Sonneborn et al. (2020), the IASP's (International Association for the Study of Pain) portrayal of pain underscores the importance for nurses to understand the complexities of pain pathophysiology and highlights the significance of pain assessment in effective pain management. A variety of verbal, non-verbal, behavioral, and multidimensional assessment tools are utilized and recognized worldwide.

Maribbay et al. (2023) considers that in acute circumstances, pain is associated with significant psychological and physiological consequences, with nurses serving as the vital link between the patient and the healthcare system. As advocates for patients, nurses hold a pivotal role in evaluating a client's pain to facilitate the implementation of effective pain management strategies (Bengtsson, 2016).

Yesilyurt et al. (2021) convinces that assessments should always be recorded. The patient must be told it is his or her responsibility to make a self-assessment. It is important to assess pain both at rest and during exertion and during various daily activities. The most appropriate meter for the pain can be used in the assessment:

Figure 1 is the Numerical Rating Scale (NRS), employed to evaluate and measure a patient's degree of pain intensity. It spans from zero to ten, where zero denotes "No pain," and ten signifies the "Most severe pain imaginable." As shown in figure one, this scale offers a standardized and measurable approach for healthcare providers to gauge and track a patient's pain across time, assist in treatment determinations, and assess the efficacy of pain management measures (Yesilyurt et al. 2021).

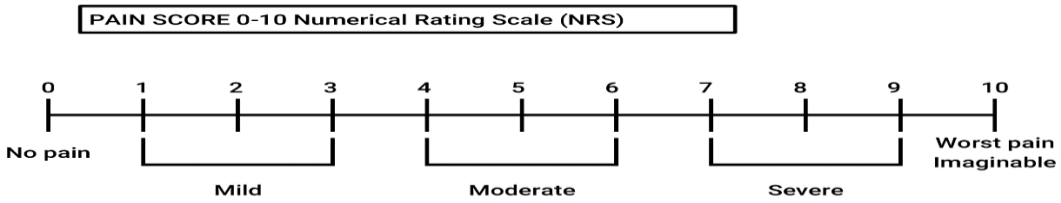

Figure 1. Numerical rating scale, Yesilyurt et al. 2021.

Figure 2 shows a verbal rating scale that classifies pain intensity into four groups. A brief description accompanies each category to help the patient select the option that best represents their current pain experience. As shown in figure two, the VRS allows patients to communicate their pain levels using more relatable, everyday language, which can be particularly useful for individuals who have difficulty with numerical concepts or when there are language barriers (Kliger et al. 2015).

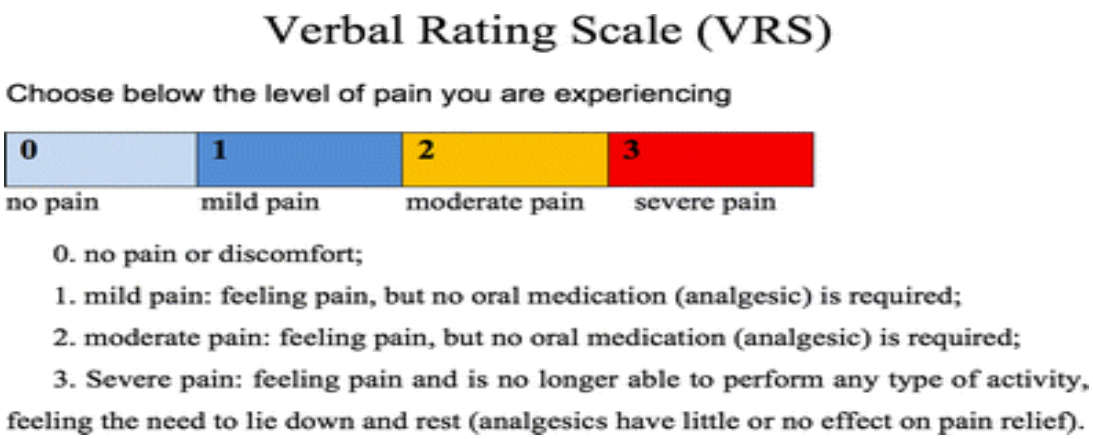

Figure 2. VRS (Verbal Rating Scale) 0 – 4. Kliger et al. 2015.

Figure 3 is a visual analog scale used to obtain qualitative data. The scale represents the degree of pain. Each numerical value increases with the increase in pain intensity. As depicted in figure three, this visual scale aims to provide an intuitive way for patients or

individuals to self-report and quantify their perceived level of pain or discomfort (Kliger et al. 2015).

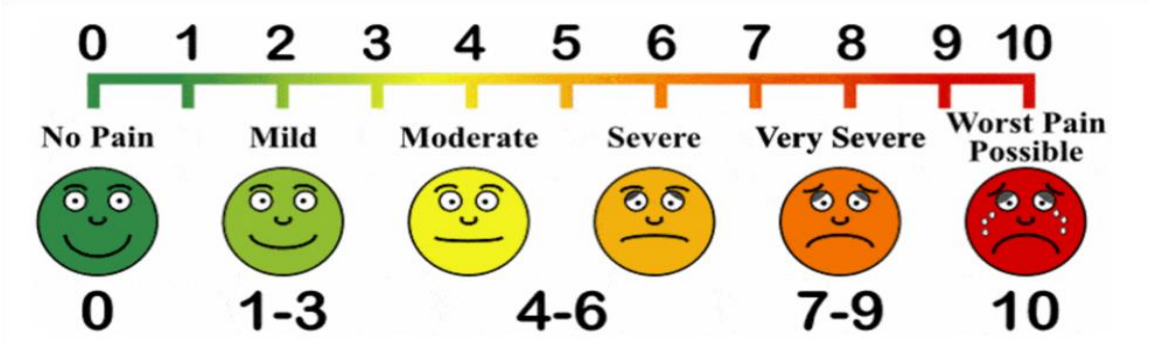

Figure 3. Visual analog scale (Kliger et al. 2015)

Hjermstad et al. (2011) holds that pain tends to cause certain symptoms and signs in patients, for example, tachycardia, increased respiratory rate, raised blood pressure, Cold and clammy skin, sweating, restlessness, and holding a painful body part. It is critical to offer pain relief before the pain reaches a maximum level to enable the full therapeutic effects of the drug or non-drug intervention. Thong et al. (2018) accentuates that pain relief is chosen according to the level of pain. If pharmacological methods are used, the dose is titrated while monitoring the response. During the diagnosis and assessment of pain fast acting analgesics are preferred. The different pain mechanisms influence the planning of drug therapy. Non-medical therapies should also be considered.

Carr et al. (2010) expresses that pain transmission begins with the apparent nerve fibers; nociceptors of the peripheral nervous system activated by various stimuli. The message about pain is transmitted to the posterior horn of the spinal cord from where it slips along projection neurons farther into the brain. The propagation of the pain message to the brain activates the cortical and subcortical network, which includes sensory, limbic, and associative areas. Corke (2013) declares that serotonin and noradrenaline act as neurotransmitters in descending pain modulating neural pathways. The activity of the descending pathways can be enhanced with antidepressants, which reduce the reuptake of serotonin and norepinephrine in neurons. In addition, it is also possible to enhance the downward modulation of pain with drug free means.

Hinkle (2013) informs that pain can be classified according to its duration as acute or long-lasting. Long-term pain is pain that persists beyond the tissue's normal healing time (three to six months). According to the current understanding, long-term pain is not a prolonged phase of acute pain, but an independent disease with a different patho-physiological mechanism. Kalogianni et al. (2018) reasons that long-lasting pain can also be divided according to the possible underlying tissue damage; into tissue damage pain, nerve damage pain, and nociplastic pain where the pain sensation is abnormal, even though there is no straightforward evidence of tissue or nerve damage. There are some differences in the medical and other treatment guidelines for those different pain conditions.

Ibrahimoglu et al. (2020) establishes that in acute pain caused by tissue damage, for example, a wound, bone fracture, or infection, pro-inflammatory mediators released into the tissue activate peripheral nociceptors. These chemical six neurotransmitters cause nociceptors to be sensitized (primary hyperalgesia), whereby the stimulus-induced message to the central nervous system is amplified (Bengtsson, 2016).

Ford (2024) declares that in inflammation, nerve damage, or other prolonged pain, where the pain communication of nociceptors is repeated and strong, NMDA receptor-mediated increased and prolonged activity of spinal cord neurons (wind-up) is a key factor for sensitization of the central nervous system (secondary hyperalgesia). Sensitization of the central nervous system is seen when examining the patient as an increased response of their pain area to a painful stimulus, for example, a toothpick prick (hyperalgesia), or as pain caused by a normally painless stimulus, for example, a cotton swab (allodynia). Taverner et al. (2014) professes the view that one factor in the chronicity of pain is insufficient pain-reducing inhibition. In the descending pathways of the brain stem, there are also nerve pathways that facilitate the pain message's propagation, which are especially involved in continuing pain related to nerve damage.

3 Hip Fractures

3.1 Hip fractures

The American Academy of Orthopaedic Surgeons (2012) exhorts that hip fractures hugely impact an individual due to the significant role the femur plays in a human being's everyday life. The femur's design is meant to cope well with the stresses of activities of daily life i.e., walking and standing, however, it is poorly designed to deal with pressures such as falls (Adamidou & Hartofilakidis, 2017). Another aspect of hip fractures that complicates the situation even more is the location of the fracture, as this influences the type of treatment, i.e., the type of surgery.

Lee et al. (2014) points out that fractures are grouped into three categories depending on what section of the bone is affected. There is a group that involves the femoral neck, located under the femur's head. A second type includes fractures within the intertrochanteric crest; the bone which links the greater and lesser trochanters. Subtrochanteric fractures begin at or beneath the lesser trochanter and affect the femoral shaft directly. Modig et al. (2019) explains that an essential aspect of hip fractures is the influence of the fracture, therapy, and recovery on the acetabulum. If there was previous damage or the acetabulum's integrity was compromised, this might affect the type of therapy to be used.

Halonen (2022) upholds that according to estimates, two out of five women over 50 and one out of seven men will break a wrist, vertebra, or hip during their remaining lifespan. About 6,000 – 7,000 people break their hips every year. The incidence of hip fracture increases exponentially with age. Factors Such as prevention of osteoporosis and falls, and the improved health of the elderly have been linked to a decline in hip fracture incidences (Panula et al. 2011). The constantly increasing obesity of Finns in comparison to the fact that a low body mass index is a strong risk factor for hip fractures, explains why fractures are on the decline.

Edwards et al. (2017) expresses that the risk of hip fracture is increased by frailty and movement difficulties, dementia diseases, poor vision, and orthostatic hypotension. Many medications in these patients, especially psychotropic medications, can increase

the risk of falls. Advanced age, previous fractures, and lack of movement increase the risk of hip fractures. Brunazzi et al. (2008) observes that, it Is estimated about 1/3 of people over 65 who live at home fall at least once a year. With age, the tendency to fall increases so it is estimated that about half of people over 80 living at home falls at least once a year. Women fall more often than men. 40% of falls among elderly people living at home occur indoors.

Best (2005) appraises that the risk of falling for people living in an institution is estimated to be up to five times higher than the risk of peers living at home. The higher number of falls is explained by the fact that they are sicker than those living at home. Another reason is also the controlled environment and more detailed reporting of falls. One in three of those who fall can be classified as those who fall frequently.

Adamidou et al. (2017) asserts that the most serious of the immediate consequences are head injuries and broken bones. 5% of 65-year-olds need treatment every year due to a fall accident, 40% of them due to fractures. A hip fracture is a common fracture in the elderly due to a fall because the elderly often fall directly onto their hip without the protective extension reflex of the hand (Bengtsson, 2016). Along with slowing down osteoporosis, the prevention of falls becomes the most important means of reducing fractures.

Daisuke et al. (2008) advocates that, along with the tendency to fall, weakening bone strength exposes the elderly to bone fractures, the most serious of which are femur fractures. Bone tissue regenerates, breaks down, and forms throughout life. As you get older, more bone is resorbed than new bone is formed. Bone mass is at its greatest between the ages of 20 and 30 and begins to decrease after about 40 years of age (Gaffney et al. 2017). Decreased bone mass, osteopenia, and weakening of bone strength are part of the inevitable aging process, but it is good practice to prevent its progression into severe osteoporosis and eventually fractures.

Yli-Kyyny (2022) underscores that the individual interventions aimed at elderly people living at home, which address all identified risk factors, reduce the risk of falling and hip fracture. Strength and balance exercises are important in preventing falls. Hip protectors can be used to prevent hip fractures in elderly people, who have an elevated risk of falling (Boreski et al. 2014). The problem with protectors is usability, as many elderly

people find their use cumbersome. In institutional care, however, this can be implemented easily, as the absolute risk of fracture in elderly people in institutional care is high, and the fracture-preventing effect of hip protectors is also high. Below in figure four is a depiction of a hip joint.

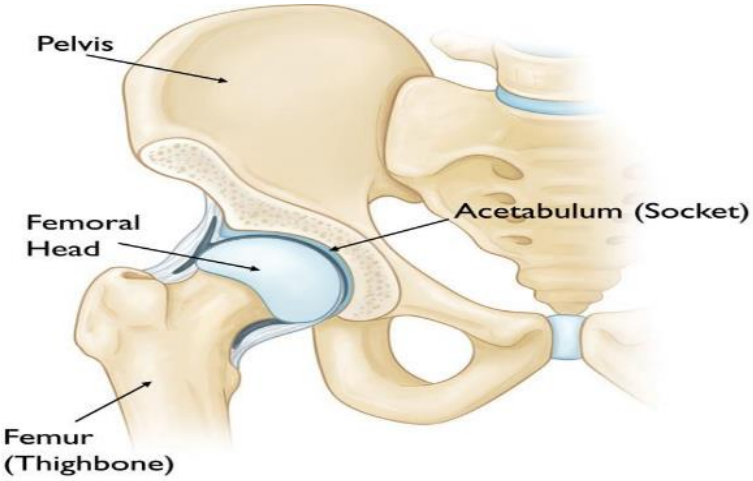

Figure 4. Normal hip anatomy. (AAOS. 2012)

3.2 Treatment of Hip Fractures

Matta et, al. (2022) articulates that there are various methods of treating bone fractures, for example, the most common method is core nailing, often reinforced with bone cement. Sometimes it is more appropriate to treat a fracture of the upper part of the femur with a replacement prosthesis. A fracture of the upper part of the humerus shaft is treated with bone cement and plate fixation (Mortazavi & Freedman, 2019). Clavicle fractures, on the other hand, are treated conservatively. Preventive surgery should have its own treatment line in the hospital, as it is not appropriate to keep patients who need it on the waiting list when the situation is getting worse.

Dargel et al. (2014) stresses that the operation must be performed without delay so that the patient can move as soon as possible after the operation. A non-dislocated fracture of the femoral neck is usually treated by osteosynthesis with cannulated screws (Manninen et al. 2017). A dislocated fracture of the neck of the femur is usually treated with a cement-fixed partial prosthesis, but osteosynthesis can also be attempted.

Perkins. (2021) describes that total arthroplasty may be the best option in the treatment of a dislocated fracture of the femoral neck for patients who are still expected to move

actively and live a long time. A subtrochanteric fracture is usually treated with a long core nail. The goal is to provide as much stability as possible, because of the elderly patients' limited ability to learn the weight threshold or reservation/limitation.

Lee et al. (2014) informs that when a patient first arrives at a clinic after suffering a hip fracture, the radiologic assessment of the damage and the surgical repair are typically the main priorities. However, it has been demonstrated that patient function following surgery is improved by a more integrated treatment plan that offers a more thorough assessment of health, functional ability, underlying diseases, and social situation, pain relief, hydration, oxygenation, nutrition, delirium, and early mobilization (Gill, 2021).

Joelsson et al. (2010) reasons that narcotic painkillers are typically given out automatically in emergency rooms, causing patients to become extremely sedated and confused. As a result, patients are sometimes unable to engage in meaningful conversation with the orthopedic surgeon regarding their condition or suggested course of therapy (Manninen et al. 2017). Thus, surgeons should persuade other medical staff members working in the emergency department to reconsider using different medications other than narcotics, for example paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs). Healthcare providers who treat elderly patients just after a hip fracture should also be aware that these patients typically need far fewer doses of painkillers than other patients.

Saga et al. (2024) speculates that in certain hospitals, patients who have been admitted to the emergency room with hip fractures have a nerve block performed by the anesthesiologist as soon as they arrive. Early hip fracture surgery has been linked to improved functional results, reduced hospital stays and pain duration, and decreased risks of complications and mortality. Thus, orthopedic surgeons ought to urge hospital management and medical staff to facilitate hip fracture patients' appointments as soon as feasible (Thomas, 2003).

Gaffney et al. (2017) professes that the orthopedic surgeon can help this process by scheduling procedures for early in the morning and later in the day or night. Patients who arrive late at night can have surgery first thing in the morning, and those who arrive throughout the day can have surgery that same day (Waterman et al. 2020). This method

works well for both the patient and the surgeon. In most circumstances, the patient can be out of bed and ambulated the following day if the surgery is done on the same day.

Jessica et al. (2015) appraises the fact that pain treatment is impacted by the time of operation and vice versa. The anesthesiologist and orthopedic surgeon must discuss anesthetic and analgesic options before surgery. Raskind et al. (2016) argues whether a nerve block will be given to the patient, what kind of anesthetic (general, spinal, or epidural), and whether nonopioid medications will be utilized during the treatment.

Perkins et al. (2021) recommends that post-operative management is important. Delirium prolongs hospitalization, increases mortality and the risk of hospitalization, and is also associated with a worse prognosis for functional recovery (Zhao et al. 2022). Special attention must be paid to risk factors for delirium, the patient's general condition, nutrition, and pain management, and minimizing the use of anticholinergic and sedative drugs.

Olsson et al. (2007) reasons that by focusing on the rehabilitation of outpatient hip fracture patients in multi-professional rehabilitation units familiar with the diseases of the elderly, it is possible to speed up recovery of functional capacity, shorten the duration of hospital treatment, and reduce long-term hospitalization. Demented hip fracture patients especially benefit from centralizing rehabilitation (Boreski et al. 2014). In the operations of the multidisciplinary rehabilitation unit, early comprehensive geriatric assessment, early mobilization, patient autonomy, and cooperation with outpatient care and the patient and his relatives are emphasized.

Park (2018) affirms that the increased risk of infection and the need for follow-up treatment (radiotherapy) must be considered. Risk factors like radiotherapy and chemotherapy multiply the risk of wound infection in pathological fractures and the healing rate is worse than in normal fractures (Zhao et al. 2022). Core nailing carries a risk of tumor embolization.

Matthew et al. (2017) discusses that hip fractures in elderly patients are linked to significant morbidity, mortality, and in addition postoperative delirium. Delirium leads to general functional decline, poor treatment outcomes, long stays in care institutions, and

death. Reports state that the risk for delirium is rarely assessed before operations. Factors that play a role in the risk of delirium are the length of the surgery, anesthesia, and the type of anesthesia (Waterman et al. 2020). The benefits of surgical treatment are pain relief, functional improvement, shorter hospital stays, and making nursing work easier.

Mori et al. (2017) satisfies that treatment of long bone fractures in the upper or lower limbs is often successful without major bleeding or additional complications. In contrast, hip fractures require extensive reconstruction, which increases complications and morbidity. The emphasis should be that the fracture does not ossify and that the repair of the fracture should last the entire life cycle of the patient (Thomas, 2003). The treatment goal of distal fracture repair is that immediate loading with full weight is possible after surgery and the structure lasts even for years if necessary.

Leopold (2013) urges that the benefits of surgical treatment are pain relief, functional improvement, shorter hospital stays, and making nursing work easier. Hip fractures are typically associated with a significant level of pain. The experience of pain places an extra load on the patient, which includes a heightened susceptibility to delirium, depression, and sleep disruption (Miettinen et al. 2021). Loss of independence is a significant factor contributing to depression following hip fracture, especially in individuals aged 65 years and above.

Mäkitie et al. (2024) contends that the prompt mobilization and restoration of patients to their regular lifestyle are crucial for effective care. Furthermore, the pain caused by a hip fracture frequently leads to modified reactions to treatment for other concurrent medical conditions (Zhao et al. 2022). If pain is not adequately controlled, patients may experience a decline in their ability to walk compared to their pre-injury state, and they are at a higher risk of experiencing impaired pulmonary and cardiac function.

4 Aim, purpose, and research question

This study's aim is to investigate existing literature on the use of non-pharmacological methods to manage postoperative hip fracture pain in elderly patients. This research is

useful to novice nurses and experienced nurses as it addresses a critical aspect of patient care that goes beyond medication and focuses on holistic, patient centered approaches to pain management. The research question is what non-pharmacological pain management interventions can be used alongside opioid treatment?

5 Methodology

5.1 Literature review

This study is a literature review, Miller et al. (2023) comments that the Health Care Professional Council and the Nursing and Midwifery Council require their members to research and deliver quality evidence-based practices to patients. This practice creates room for nurses to uphold high-quality standards and for every personnel to review the depth of their knowledge. Practitioners will study the research of other scholars and gain the opportunity to contribute to academia and improve the current knowledge database.

Watts (2020) encourages that Evidence Research in comparison to instinct or intuition is a systematic way of understanding. By doing research all components of knowledge and data are subject to investigation and can be proved or disqualified via more research. Ellis adds more weight to the concept by stating that the process is about using a scientific method to comprehend an issue or to set the foundation for new truths.

Bowden et al. (2022) expresses that a literature review is a generic term that means “published resources that supply an analysis of present literature.” A literature review is when an inquiry is made to dig up relevant articles within a specific subject and assessed according to the Royal Literary Fund (2018). The articles subject to review include the newest knowledge and methodological and theoretical findings to aid in finding answers to the questions asked. By integrating the material, the required parts can be collected and summed up, to enable a deep analysis to be done (Gill, 2021).

Bowden et al. (2022) holds the view that critical analyses are the steps taken to test integrity and identify gaps in existing knowledge. A literature review provides a platform where information already known about a subject can be compiled and paves a path for

further research to be conducted. This method was chosen to open our data search to the reader and give more insight into the criteria that fit this study.

5.2 Literature search

Reynolds et al. (2022) remarks that for the first search databases can be used to focus the searches to enable concepts to be manufactured from the first question asked, which would then create the foundation for the study. Literature search enables scholars to reveal the answers and find evidence for their research questions. Sifting through data highlights areas that need further research and helps fill research gaps in specific areas of study.

Perkins et al. (2021) maintains that a synopsis is at the core of primary research articles, scientific research papers revolve around studies that have been undertaken, their results, and conclusions. The initial stage of the literature search includes conducting a first assessment of the literature, a general search that seeks to find out the prevalence or amount of material on the subject. Search terms such as hip fractures, and non-pharmacological hip fracture pain management that are related to the topic you want to research can be keyed into databases, Boolean operators for example hip fractures, non-pharmacological intervention.

Coughlan et al. (2013) accentuates that ss the process of doing the initial search picks up, formulating research questions is a key step that paves the way for finding sources of data. To prevent the researcher from missing data from diverse sources or sources that implement dissimilar research methods, the literature search should be broad enough. At Jamk students enjoy access to various databases such as CINAHL, Med Line, and Google Scholar among others which are reliable sources for both secondary and primary data.

As depicted in table one, to narrow down the search to isolate articles that are more relevant to our study, the inclusion criteria below were used.

Table 1. Inclusion criteria

Inclusion criteria
Articles in English.
Full text available for JAMK students.
Recent articles from 2013 to 2024.
Articles revolving around pain and hip fractures.
The age group was targeting the elderly, 65 years and above.

The main objective of this literature search is to review existing data related to nonpharmacological post-operative hip fracture pain management. The following databases were used to conduct the search CINAHL, PubMed, Google Scholar, and Medline (EBSCO) the primary keywords were arranged into two categories, hip fractures, and non-pharmacological hip fracture pain management.

The research was conducted exclusively by two scholars, adhering to the following steps. After conducting our database search, articles were given priority based on their title, after reading the abstracts the chosen articles were then narrowed further. The next step was to apply the inclusion criteria, and only the worthiest articles were chosen. The end game was a cross-examination of each other's respective articles and brainstorming on which articles were aligned with research objectives and the best answers to research questions.

The studies used in this review were selected by using the following process: first, a total of 2280 studies were identified after using PICOS search in CINAHL, PubMed, and Google Scholar. Second, 210 studies were retained after filtering the results using the inclusion criteria. Third, 170 studies were excluded based on the titles of articles that did not relate to the nature of this study. Hence, 40 studies were retained. Fourth, 30 studies were chosen after reading the abstracts of the articles. As shown in figure five, 10 studies were selected after reading the articles.

Figure 5. Study Selection Process

5.3 Data analysis

Jaatinen et al. (2022) affirms that finding usable peer-reviewed articles is a primary requirement for a literature review. The material found in the highlighted sources should be converted into information that can form a foundation for new research. Accomplishing this task requires the complex cognitive ability to display mastery of the literature tasks such as listing, defining, describing, and identifying must be completed. The scholar must prove they have reviewed the articles and extracted useful information.

Jaatinen et al. (2022) maintains that data analysis entails combining, interpreting, modifying, rearranging, designing, composing, and generalizing. The quintessence of the analysis is to combine the literature reviewed into a whole bigger than each part. During data analysis, the scholar should assess, decide, recommend, select, judge, explain, discriminate, support, and conclude. The literature review aims to separate theories, opinions, and empirical facts.

The data analysis in this study uses a content analysis approach. Bengtsson, (2016) reports that content analysis aims to organize and elicit meaning from the collected data and draw realistic conclusions from it. The researcher must choose whether the analysis should be of a broad surface structure (a manifest analysis) or a deep structure (a latent analysis).

In content analysis, one identifies the main characteristics of the qualitative data. During the entire process, the researcher must adhere to a qualitative perspective, and the main issue is to achieve the rigor and credibility that make the results as trustworthy as possible (Bengtsson, 2016). There are two main approaches to qualitative content analysis: inductive and deductive analysis methods.

Unneby et al. (2022) affirms that an inductive approach involves analyzing data without implying the existing theoretical frameworks, while a deductive approach analyses data with the existing theoretical framework. Inductive reasoning is developing conclusions from collected data by weaving added information into theories. Figure six below depicts the methodology used.

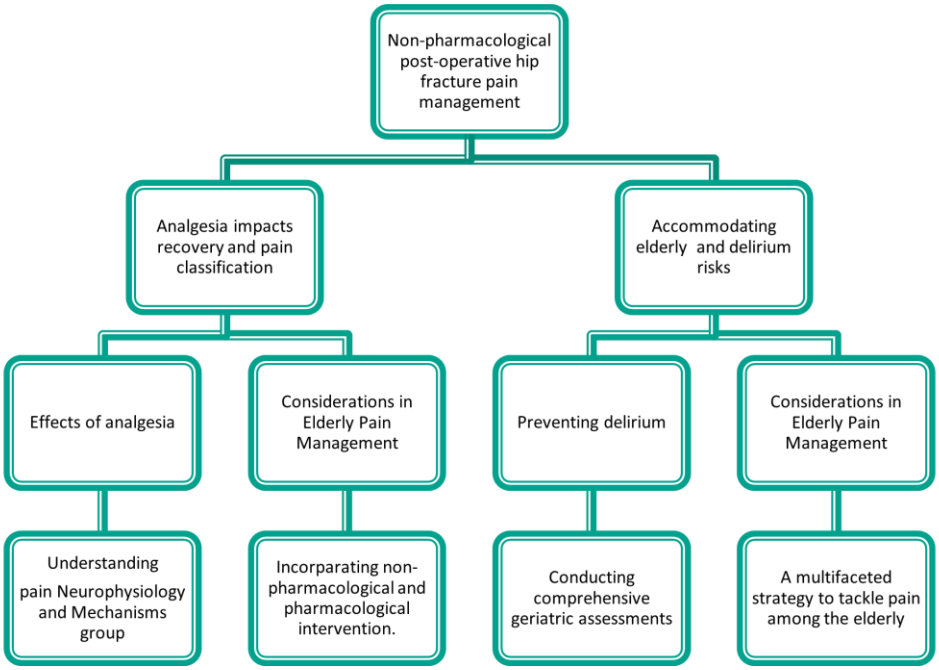

Figure 6. A flow chart showing the inductive analysis approach.

Frandsen et al. (2021) assures that when a study has been initiated, five fundamental issues must be considered in the planning process: the aim, the sample and unit of analysis, the choice of data collection method, the choice of analysis method, and the practical implications.

6 Results

In this study, the key categories include the initial opening code, the developing categories, and the constant comparative analysis. Table two below shows, there are sub-headings under each main heading.

Table 2. Themes and categories for data analysis.

Heading	**Sub-heading 1**	**Sub-heading 2**
Non-pharmacological post-operative hip fracture pain management	Analgesia impacts recovery and pain classification	Accommodating elderly and delirium risks

Analgesia impacts recovery and pain classification	Effects of analgesia	Considerations in Elderly Pain Management
Effects of analgesia	Understanding Pain Neurophysiology and Mechanisms	Incorporating non-pharmacological and pharmacological intervention.
Accommodating elderly and delirium risks	Preventing delirium	Considerations in Elderly Pain Management
Preventing delirium	Conducting comprehensive geriatric assessments	
Considerations in Elderly Pain Management		A multifaceted strategy to tackle pain among the elderly

The table shows "non-pharmacological post-operative hip fracture pain management," and its two main sub-topics, "Analgesia impacts recovery and pain classification" and "Accommodating elderly and delirium risks." Each sub-topics further branches into additional sub-topics, illustrating the inductive process of breaking down the main topic into more specific and detailed aspects.

6.1 Non-Pharmacological Post-Operative Hip Fracture Pain Management

The results of the study show that non-pharmacological therapies are highly effective in enhancing patient outcomes. For example, physical therapy helps not only with pain management but also with mobility restoration and shorter hospital stays. It has been demonstrated that cognitive-behavioral therapy helps patients control how they perceive pain, which lessens the emotional and psychological toll that pain takes (Min et al. 2021).

Zhao et al. (2022) suggests that elderly patients should seek medical attention immediately after an accident to improve mobility functions and reduce serious hip fracture problems. The results also show that early hip fracture surgery has been linked to improved functional outcomes, reduced hospital stays and pain duration, and decreased risks of complications and mortality.

Frandsen et al. (2021) encourages that health professionals should undergo continuous training and education to advance their skills and knowledge on better hip pain management among the elderly. Ehrström et al. (2018) instructs that the approaches to pain management are available without the side effects of medication.

6.2 Analgesia Impacts Recovery and Pain Classification

Unneby et al. (2022) propounds that a multimodal method where pharmacological and non-pharmacological interventions are used to help manage hip fracture pain among the elderly is necessary. The results of the study showed that although analgesics are useful in treating post-operative pain in the short term, long-term use of them can impair functional recovery, especially in older individuals.

Frandsen et al. (2021) encourages alternative choices for managing pain are provided by non-opioid analgesics such as acetaminophen and NSAIDs, but these are not without dangers, especially when used by patients who also have comorbid illnesses. As the results show, well-trained nurses will use the patient's data to determine the choice of analgesics and non-pharmacological hip pain management interventions.

The results underscore that nurse's approach is determined in large part by the classification of pain. According to the result, a more detailed knowledge of the many forms of pain can result in more tailored treatments that shorten recovery times and lower the risk of overmedication (Zhao et al. 2022).

6.3 Effects of Analgesia

According to our result, the processes by which analgesics interact with the neurological system to reduce pain are examined in this portion of the research, with an emphasis on both the intended and unintentional consequences. Analgesics can affect several physiological processes, such as inflammation, neurotransmitter release, and pain signal transmission, by modifying pain pathways (Filiatreault et al. 2018).

The study also looks at how analgesics modulate inflammatory responses; for example, while NSAIDs can lower inflammation, they may also slow down the healing process in

older people (Min et al. 2021). The result showed the significance of including non-pharmacological therapies because of the intricate ways in which analgesics impact the neurophysiological pathways underlying pain.

6.4 Accommodating Elderly and Delirium Risks

The study identifies the main causes of this vulnerability, which include comorbidities, age-related modifications in medication metabolism, and polypharmacy. According to Loggers et al. (2020), older people who take specific kinds of analgesics, especially opioids, have a higher chance of developing delirium. The research does, however, also show that poor pain management, which results in excruciating pain, can act as a trigger for delirium. Finding a balance where pain is adequately treated without raising the risk of cognitive problems is therefore the challenge (Filiatreault et al. 2018).

According to Unal et al. (2022), the study also makes numerous recommendations for reducing the risk of delirium while controlling pain, such as the use of non-opioid analgesics, multimodal pain management techniques, and close observation of cognitive function following surgery. The results also highlight the crucial elements of delirium prevention, including non-pharmacological therapies such as early mobilization, cognitive stimulation, and environmental adjustments.

6.5 Preventing Delirium

The results underscore the importance of conducting comprehensive geriatric assessments pre-operatively to identify patients at risk for delirium (Frandsen et al. 2021). These assessments include evaluating cognitive function, comorbid conditions, medication use, and social support systems. The findings highlight that proactive identification of at-risk patients allows for the implementation of tailored intervention strategies. The study also points out that early mobilization and minimizing the use of restraints and sedatives are key strategies in preventing delirium (Zhao et al. 2022).

The research advocates for a holistic care approach, where preventing delirium is integrated into the broader post-operative care plan. This includes collaboration among healthcare providers, patients, and families to ensure that all aspects of the patient's health and environment are conducive to recovery.

6.6 Considerations in Elderly Pain Management

The research's concluding portion highlights the necessity of treating older individuals' pain in a comprehensive approach. The research recommends a strategy that combines pharmaceutical, non-pharmacological, and preventative strategies to meet the issues faced by senior patients, given the complexity of pain management in this population (Nascimento et al. 2016).

The results of the study emphasize the efficacy of multimodal pain treatment techniques, which combine non-pharmacological therapies with well-chosen analgesics to control pain without impairing recovery or cognitive function. Ehrström et al. (2018) instructs that combining low-dose analgesics with physical therapy can minimize the hazards associated with greater dosages of medication while still providing effective pain relief.

The study also emphasizes how critical it is to address social and psychological aspects of pain management.

7 Discussion

7.1 Discussion of the Results

One of the most important aspects of healing for patients with hip fractures, especially the elderly, is the control of post-operative pain. Pain treatment techniques have historically been dominated by pharmaceutical interventions. Recent studies, however, demonstrate the increasing significance of alternatives to medication. Nascimento et al. (2016) encourages early surgical treatment combined with perioperative hip pain management is crucial. This study examines non-pharmacological techniques such as transcutaneous electrical nerve stimulation, acupuncture, cognitive-behavioral therapy, and physical therapy to see how well they work to minimize pain, promote healing, and reduce the need for analgesics.

The study aims to shed more light on post-operative non-pharmacological hip fracture pain management treatments among the elderly population that can be used by

healthcare professionals. The analysis involved identifying early signs of pain, understanding the neurophysiology of pain, and establishing effective pain management strategies. This inclusive method is key to optimizing recovery, minimizing hospital stays, and improving the overall quality of life for elderly patients with hip fractures.

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. The Distributed Nociceptive System provides a foundation for understanding complex spatial aspects of chronic pain and provides an impetus for non-pharmacological cognitive and physical therapies that can effectively target the highly distributed system that gives rise to an experience of pain (Coghill, 2020). For example, it has been demonstrated that augmenting analgesia with physical therapy improves pain relief while reducing the risk of hyperalgesia and other adverse effects. The dual strategy promotes better long-term outcomes in addition to providing a more thorough approach to pain management

The results established that early identification and mitigation of pain are not only about administering drugs but also involve analyzing and handling non-pharmacological interventions. This study highlights that hip fractures are a principal cause of admittance to acute orthopedic wards among the elderly. Non-pharmacological strategies, such as proper positioning, ice packs, and gentle mobilization, can be initiated immediately upon diagnosis to manage pain and prepare patients for further treatment (Fonseca et al. 2015). These interventions reduce the side effects related to opioid use, which is particularly significant in elderly patients who may be more susceptible to adverse drug reactions.

According to Zhao et al. (2022), early surgical treatment combined with perioperative hip pain management is crucial. Elderly patients should seek medical attention immediately after an accident to improve mobility functions and reduce serious hip fracture problems. Early hip fracture surgery has been linked to improved functional results, reduced hospital stays and pain duration, and decreased risks of complications and mortality. Nurses who offer efficient perioperative pain management encourage recovery which reduces the risk of postoperative delirium (Zhao et al. 2022).

According to Nascimento et al. (2016), pain management is crucial for mitigating pain levels and promoting patient recovery. Zhao et al. (2022) underscores that efficient peri-operative pain management also reduces the risk of postoperative delirium, which is a significant concern in elderly patients. Post-operative pain management poses distinct issues for elderly patients, primarily because of their heightened vulnerability to delirium.

Min et al. (2021) advocates for a detailed recovery through a multidisciplinary tactic, emphasizing the importance of non-pharmacological methods at their best. The study identifies the intricacies of regular improvement and adaptation in pain management strategies to cater to the unique needs of elderly patients with hip fractures.

Nurses must be aware of the degree of pain elderly patients are experiencing to manage pain effectively. Therefore, nurses should be well acquainted in knowing the role of nociceptors, neural pathways, and central sensitization in pain transmission and perception. As the results show, well-trained nurses will use the patient's data to determine the choice of analgesics and non-pharmacological hip pain management interventions (Filiatreault et al. 2018).

A detailed approach targets pain from different perspectives utilizing physical therapies and complementary therapies such as acupuncture to help manage hip fracture pain. Alcantara et al. (2020) demonstrates that the result advocates for non-pharmacological approaches as there is an increased risk of infection and the need for follow-up treatment (radiotherapy) with pharmacological interventions. A more comprehensive approach to pain management may result from the incorporation of these techniques into routine treatment procedures, particularly for individuals who are more susceptible to analgesic-related problems.

Adams, et al. (2020) reasons that continuous education and training for healthcare professionals are critical for implementing effective pain management strategies. Nurses should be well-trained and have an in-depth comprehension of the neurophysiology of mild and chronic pain. Based on up-to-date knowledge, a positive attitude and good

practice of pain management by the nurse will minimize the consequences and complications of pain; as a result, the nurse is obliged to possess updated knowledge and understanding of pain.

The main goal of the results is to corroborate non-pharmacological interventions such as physical therapy which play an intricate role in augmenting pharmacological medicine in addressing hip fracture pain. After hip fractures in geriatric patients, existing comorbidities worsen, and new complications are prone to occur. Comprehensive rehabilitation is essential for promoting physical function recovery and minimizing complications, which can be achieved through a multidisciplinary approach (Min et al. 2021).

Physical therapy provides customized pain management approaches, which would reduce the need for standard medication. Nerve blocks reduce hip pain while physical therapy improves the overall function of the patient. Sometimes, as Snapp et al. (2024) realized, patients who have been admitted to the emergency room with hip fractures have a nerve block performed by the anesthesiologist as soon as they arrive.

According to the second theme of the analysis, the study highlighted the imperative method of combining pharmacological treatments like opioids with non-pharmacological interventions such as nerve blocks and physical therapy. This tactic addresses the complex nature of pain in elderly patients, who often have multiple comorbidities and are at higher risk of complications from pain and its treatment. This should help the patients to improve rapidly during the post-fracture period (Hommel et al. 2003).

Nurses should be able to offer customized hip pain management procedures that factor in the elderly patient’s unique limitations and vulnerabilities. This requires adjusting medical dosages accordingly, scheduling interventions, and emphasizing patients' choices for pain control. Nurses can minimize the severe effects and risks brought about by analgesics. Loggers et al. (2020) highlights that the current knowledge of non-operative management (NOM) of frail patients with hip fractures is limited and the natural course of the injury is unknown thus the generalizability of the available evidence is limited for several reasons.

Barros et al. (2016) establishes that nurses should use tests to gauge nutritional status, cognitive functions, the patient's social support system, and functional abilities. As a

result, customized approaches for hip pain management can be established to quicken the recovery period. Min et al. (2021) holds the view that after hip fractures in geriatric patients, existing comorbidities worsen, and new complications are prone to occur. This study explores the dual effects of analgesics on pain classification and recovery. Analgesics play a crucial role in the treatment of acute post-operative pain, but their impact goes beyond just alleviating pain. The use of analgesics is influenced by the type of pain—acute, chronic, or neuropathic—since various medication classes target distinct pain processes. The study does, however, point out how complicated this link is and how carefully balancing analgesic use might maximize recovery.

As Unal et al. (2022) demonstrates that by analyzing hip fracture pain management is the nurse's imperative responsibility. To prevent and mitigate delirium complications, effective pain control strategies should be established to improve overall outcomes in elderly patients. This helps improve and minimize delirium triggers such as stress responses and sleep disruptions, helps promote cognitive function, and fosters quick.

The results suggest that providing emotional and physical support is crucial for hip fracture healing among elderly patients. By conducting geriatric assessments, nurses recognized comorbidities, assessed risk factors, and planned interventions that went beyond pain management. Effective pain control strategies that prevent complications such as delirium are essential for promoting cognitive function and facilitating quick recovery (Unal et al. 2022).

The study highlighted the necessity for continuous training and education for healthcare professionals. This is essential to improve their skills and knowledge in hip pain management, such as adopting innovative pain tools for analysis (Frandsen et al. 2021). Conversely, many therapies for chronic pain that potentially target multiple central nervous system mechanisms and that are often efficacious, such as cognitive behavioral therapy (CBT) and physical therapy, are underutilized and under-reimbursed due to limited understanding of how they work (Oliver et al. 2017).

Further research is needed to explore the long-term outcomes of various pain management strategies and to identify the most effective combinations of pharmacological and non-pharmacological interventions. Additionally, Loggers et al. (2020) considers that

there is a need for more studies on the natural course of hip fractures in frail patients and the generalizability of existing evidence to different populations.

7.2 Ethical consideration and criticism

The ten papers that made up this review were all very high-quality upholding ethical norms. It is crucial whether working with pre-existing data or performing research on human subjects. This study is solely based on secondary sources there is no personal data or human participants involved. The primary ethical concerns for this evaluation of the literature on nurses' attitudes about pain care in older patients have to do with how the published data from the included studies should be used and presented (Holly et al. 2017).

Above all, it was essential to correctly credit and recognize each source that was used for the review. Academic integrity norms would have been broken and plagiarism would have resulted from not doing so. Reynolds et al. (2022), highlights that specific consideration has been paid to recognizing the effort and ideas of others and not taking it as our work. Precise referencing enables readers to confirm references and assess the reliability of the data showcased. Second, each study's results and conclusions were presented truthfully.

As Watts (2020) highlights, the study maintained a rigorous and systematic approach to literature selection, data extraction, and analysis, and deliberate attempts were made to avoid any predetermined ideas or personal biases that could impact the interpretation or analysis of the data. This was morally right since it would create bias and compromise the integrity of the research synthesis if data were reported selectively or misrepresented; care was taken to accurately and truthfully describe the original study results.

Furthermore, it was crucial to conduct a critical analysis of the caliber and reliability of the evaluated literature (Holly et al. 2017). The research included in the review of the literature was methodologically sound, ethically sound, and well-designed. These studies are highly valuable and of high quality because of their well-defined aims, appropriate techniques, and meticulous data analysis.

These databases are widely acknowledged and utilized in the domains of nursing and healthcare research, guaranteeing that the studies incorporated in the literature review originate from reliable and subjected to peer evaluation (Watts, 2020). Conversely, the theoretical underpinning resources were acquired from the Jamk Library. As a result, the results of this body of research can help develop methods for enhancing care practices and offer insightful information about nurses' attitudes regarding pain treatment in older patients.

7.3 Validity, reliability, and limitations

Regarding upholding ethical considerations, the study should also be relevant and dependable. The researchers should not manipulate the data and exhibit neutrality. A systematic and rigorous method was implemented throughout the literature review. The appropriate data was thoroughly assessed through sources critically evaluated for quality and credibility before being included. Perkins et al. (2021) illustrates that the content analysis approach utilized multiple coding stages and cross-verification by both researchers to guarantee accurate clarification of the data.

To comprehensively ensure the inclusion of appropriate and high-quality resources, databases such as PubMed, CINAHL, and Google Scholar were investigated using relevant keywords (Coughlan et al. 2013). To establish consistency, each researcher coded the information independently and compared each other’s work while reconciling the data. To ensure validity and credibility a systematic and meticulous approach is implemented by carefully evaluating the included sources, through engaging extensive content analysis methods thus maintaining transparency.

While validity is concerned with trustworthiness, reliability is concerned with the results that can be reproduced. Obvious details about the procedure, including the literature search approach, inclusion conditions, and data analysis process, were provided to enhance the reliability of the study. This fosters transparency for replication and verification by other researchers (Hulsbæk et al. 2015).

Reporting the methodology is a key factor in guaranteeing reliability. The inclusion and for choosing applicable literature were outlined, allowing other researchers to comprehend the scope and boundaries of the review.

For reliability, the researchers provide a detailed explanation of the data analysis approach. Ehrström et al. (2018) illustrates that by following the laborious methodological procedures of content analysis, the researchers enhanced the reliability and replicability of their results. It is worth noting, that for a document to be reliable does not translate it to be valid, however, it signifies the study has been consistent, replicable, and marginally influenced by individual biases or subjective interpretations.

Despite having a comprehensive approach, this study also had its limitations. First and foremost is the limited number of relevant articles on non-pharmacological pain management for hip fractures in the elderly. Furthermore, the literature search was constrained to articles published in English, which could have omitted relevant papers in other languages. Finally, this literature review was conducted by two novice authors, some mistakes might have occurred due to the rigorous research process.

7.4 Conclusion and Recommendations

It is evident from the study of the significance of non-pharmacological pain management therapies for elderly patients with hip fractures. According to Edwards et al. (2017), the results also allow us to conclude that merging pharmacological medicine with various non-pharmacological procedures, such as nerve blocks, physical therapy, and complementary therapies is the best approach for hip pain management. Patients' hip pain management needs could be customized when geriatric assessments are analyzed. Woolfe, (2010) debates that early detection and treatment of hip injury among the elderly prevents delirium and improves patient outcomes.

This also advocates for the roles nurses play in treating and managing pain in hip fractures among the elderly population. Nurses observe patients' pain levels, recognize potential obstacles to efficient pain control, and cooperate with interdisciplinary teams to develop and implement personalized care plans for their patients (Loggers et al. 2020).

This study emphasizes a holistic approach to help mitigate hip pain management among the elderly. By integrating non-pharmacological therapies, nurses and other health providers would hasten the healing process while maintaining pain to minimum levels. As this population is preset with varied comorbidities, personalized care is intricate for hip pain control.

According to the literature review here are a few recommendations. First, hospitals should establish and implement evidence-based clinical plans that incorporate both pharmacological and non-pharmacological methods for pain management for elderly patients with hip fractures (Kyngäs, 2020).

These regulations should be grounded on the latest research evidence and offer clear procedures for healthcare professionals to follow. Zhao et al. (2022) establishes that we should also provide complete training and education programs for healthcare professionals, especially nurses, on pain neurophysiology, assessment tools, and various non-pharmacological interventions for effective pain management in geriatric populations.

Timmermans et al. (2022) demonstrates that we should also encourage further research to analyze the efficacy and patient experiences on specific non-pharmacological interventions, such as nerve blocks, physical therapy modalities, and complementary therapies, in managing hip fracture pain in the elderly.

Lastly, it promotes policy changes and sufficient resource distribution to support the implementation of non-pharmacological pain management strategies in healthcare settings, specifically in geriatric care units and rehabilitation amenities. This may involve providing capital for specialized equipment, staff training, and the establishment of devoted pain management programs.

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Appendices

Appendix 1. Definition

Terminology of pain

Allodynia – Pain caused by a weak stimulus.

Dysesthesia – Unpleasant strange sensation (spontaneous or stimulus induced).

Hyperalgesia – Unusual increased sensitivity to pain.

Hyperpathia – A pain syndrome characterized by post stimulus delay; whereby nociceptive stimuli cause over dramatic pain levels.

Hypoalgesia – Decreased sensitivity to pain.

Hypoesthesia – Decreased sensitivity to touch or sensation.

Paresthesia – Abnormal sensation (spontaneous or stimulus induced), i.e., tingling, pricking (pins and needles), caused by damage or pressure on peripheral nerves.

Appendix 2. Images

An image of a nursing plan

Cues	Inference	Nursing Diagnosis	Panning	Interventions	Rationale	Evaluation
S: 'sumasakit ang aking tyan" as verbalized by the client Pain Scale: 5/10 as 0 is the lowest and 10 is the highest With the pain characteristics of moderate pain O: • with facial grimace • verbal report of acute pain • guarding behavior on the left lower extremity	External and internal factor aggravates the nerve endings in the lower extremity causing production of prostaglandin, bradykinin, histamine and progesterone to react on the specific region causing pain sensation felt by the client	Acute pain related to post surgical as manifested by facial grimace, guarding behavior and verbal report of pain felt in the lower abdominal region	After series of nursing interventions the client should manifest a decrease in the pain scale of 5/10 to a manageable level of 0/10	• Assess the clients pain scale and perception • Encourage verbal report during and after the nursing interventions • Monitor V/S and pain scale • Teach client divertional activities • Advise breathing exercise • Administer Etoricoxib 120mg /tab as prescribed by the physician	• To identify the intensity, onset, duration, quality, and quality of the pain • Pain is highly subjective and to identify the effectiveness of the interventions • Obtain baseline V/S, V/S changes during onset of pain, for future comparison after interventions • To divert clients attention from pain • To allow proper O2 supply in the body, clients tend to stop breathing during pain • Relieve the client of pain using pharmacologic intervention	After series of nursing interventions goals are met as evident of the clients decrease in pain scale from 5/10 to 0/10 or with no pain and discomfort and positive verbal report of the client during the evaluation

1. Non-pharmacological intervention to control chronic pain and outcomes.

	Interventions	Outcomes
Pain Management	1 - Multidiscilplinary Chronic Pain Management Programme [6]	1 - Pain Intensity reduction [4,7]
	2 - Electro-massage with interferential current [8]	2 - Decreased pain perception [6]
	3 - Auditory and Visual stimulation [10]	3 - Decrease usage of drugs [4,10]
	4 - Use of woollen undergarments [4]	4 - Functional capacity improvement [8,9]
	5 - Auricular Acupressure [7]	5 - Quality of Life improvement [6,8]
Functional State	6- Follow-up Programmes [6]	6 - Better sleep pattern [10]
Coping Strategies	1 - Group-Therapy Sessions [5]	1 - Self-management Improvement [5,6]
	2 - Problem-solving strategies [5]	2 - Therapeutic Adherence promotion [5]
	3 - Behavioural Cognitive Therapeutic [6]	3- Distress reduction [5]
	4 - Therapeutical Dialogue [6]	
Quality of Life	1 - Group-Sessions Family Participation [5]	1 - Family workload relief [5]
	2 - Pain treatment information [5]	3 - Nursing care satisfaction [5]
	3 - Pratictioners' Evaluation [5]	4 - Cost-Effective relation (reduction in pharmacological drugs' usage) [4,10]
Literacy	1 - Health Education (healthy lifestyles) [5]	1 – Rational utilization of health services [5]

An image showing non-pharmacological therapies

Appendix 3. Summary of reviewed articles

Author and country of study	Study	Study objectives	Methodology, design, data collection and analysis	Main study findings	Critical appraisal
Ehrström et al. 2018 (Finland)	Physiotherapy pain curricula in Finland: a faculty survey	To describe the content and extent of pain education in physiotherapy curricula in Fin-land	Cross-sectional survey study. Data was collected through an online survey and analyzed using descriptive statistics	The study found that pain education in physiotherapy curricula in Finland varied greatly, with some institutions providing comprehensive pain education while others had limited coverage.	35
Filiatreault et al. 2018 (Canada)	An umbrella review of clinical practice guidelines for managing patients with hip fractures and a synthesis of recommendations for the pre-operative period	To synthesize recommendations from clinical practice guidelines for managing patients with hip fractures during the pre-operative period	Umbrella review of clinical practice guidelines. Data collected through literature search and analyzed using qualitative synthesis	The review identified recommendations for various aspects of pre-operative management, including pain management, delirium prevention, timing of surgery, and pre-operative assessments and interventions.	22
Frandsen et al. 2021 (Denmark)	Poor adherence to guidelines in treatment of fragile and cognitively impaired	To investigate adherence to national guidelines for the treatment of fragile and cognitively impaired	Data collected through delirium assessment and analyzed using statistical methods	The study found poor adherence to guidelines in the treatment of fragile and cognitively impaired patients with hip fractures, particularly in the areas of pain management, delirium	15
Jaatinen et al. 2022 (Finland)	Factors associated with and 1-year outcomes of fear of falling in a geriatric post-hip fracture assessment	To identify factors associated with fear of falling and its 1-year outcomes in geriatric patients after hip fracture patients with hip fractures	Analysis was done using regression models.	Fear of falling was associated with older age, lower BMI, higher comorbidity, lower mobility, and poorer physical performance. At 1-year follow-up, fear of falling was associated with poorer mobility and physical performance.	11

Loggers et al. 2020 (Netherlands	Prognosis of nonoperative treatment in elderly patients with a hip fracture	To assess the prognosis of nonoperative treatment in elderly patients with a hip fracture	Systematic review and meta-analysis. Data collected through literature search and analyzed using statistical methods	The study found that nonoperative treatment in elderly patients with hip fractures was associated with higher mortality rates, lower functional outcomes, and higher risks of complications compared to operative treatment.	10
Min et al. 2021 (South Korea)	Clinical practice guideline for postoperative rehabilitation in older patients with hip fractures	To develop a clinical practice guideline for postoperative rehabilitation in older patients with hip fractures	Systematic review and expert consensus process. Data collected through literature review and expert panel discussions	The guideline provides recommendations for various aspects of postoperative rehabilitation, including early mobilization, exercise therapy, gait training, and functional training, for older patients with hip fractures.	7
Nascimento et al. 2016 (Brazil)	Difficulties Faced by Nurses in the Care Provided to the Elderly Affected by Femoral Fracture	To identify the difficulties faced by nurses in caring for elderly patients with femoral fractures	Data collected through interviews and analyzed using content analysis technique	Nurses faced challenges related to lack of training, insufficient human and material resources, communication problems, and challenges in providing adequate care to elderly patients with femoral fractures.	3
Unal et al. 2022 (Turkey)	Evaluation of the effectiveness of delirium prevention care protocol for patients with hip fracture	To evaluate the effectiveness of a delirium prevention care protocol in patients with hip fractures	Data collected through delirium assessment and analyzed using statistical methods	The delirium prevention care protocol was effective in reducing the incidence and duration of delirium in patients with hip fractures compared to the control group.	5
Wan et al. 2020 (China)	Fascia iliaca compartment block for perioperative pain management of geriatric patients with hip fractures	To evaluate the efficacy and safety of fascia iliaca compartment block for perioperative pain management in geriatric	Data collected through literature search and analyzed using statistical methods	The review found that fascia iliaca compartment block was effective in reducing pain and opioid consumption in geriatric patients with hip fractures, with a low risk of complications.	2

		patients with hip fractures			
Zhao et al. 2022 (China)	Perioperative Multicomponent Interdisciplinary Program Reduces Delirium Incidence in Elderly Patients with Hip Fracture	To evaluate the effectiveness of a perioperative multicomponent interdisciplinary program in reducing delirium incidence in elderly patients with hip fractures	Data collected through delirium assessment and analyzed using statistical methods	The perioperative multicomponent interdisciplinary program significantly reduced the incidence of delirium in elderly patients with hip fractures compared to the control group.	6