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Nonpharmacological Pain Control Following Hip and Knee Replacements in Older Adults

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Walden University
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Abstract

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by

Adraine M. Cox

MS, Walden University, 2018

BS, Baptist Health Sciences University, 2013

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Over prescribing opioids after hip and knee replacements in older adults is closely linked to the opioid epidemic. Despite being a public health concern associated with increased mortality rates, opioids are the most frequently used method for controlling postoperative pain. Therefore is important to know whether nonpharmacological pain control methods may effectively reduce the burden of opioid addiction, thus reducing the risk of opioid-related fatalities. The purpose of this study was to determine whether a systematic review of the literature provided evidence supporting nonpharmacological methods of pain control following hip and knee replacements in older adults compared to use of prescription opioids for pain control. Lewin's change theory is directly related to changing pain treatment in the postoperative period by preparing patients with feasible methods of facilitating pain relief. Scholarly literature from 2014-2019 was assessed using inclusion and exclusion criteria, revealing 49 articles for full review. Nine studies were included in this review. Analysis of this evidence was critically appraised using the John Hopkins model. The evidence demonstrated more favorable pain control using nonpharmacological methods and nonopioid pain medications at the lowest dosage. The project positively advocates for social change by reducing the risks of drug addiction and untimely deaths. It advocates for safer pain control options, decreasing costs associated with opioid addiction treatment, providing alternative means of managing pain, treating opioid-related health conditions, providing safer communities, and promoting healthier lifestyles.

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Section 1: Nature of the Project

Introduction

Opioid use has increased dramatically in many facilities in which older patients undergo surgical procedures. Hip and knee replacements are a common surgical procedure among older adults where opioids are prescribed for pain management. Opioids are used heavily during postoperative recovery, sometimes leading to opioid abuse and further addiction (Tan et al., 2018). Since the early 1990s, when opioids were first prescribed, the opioid abuse epidemic and increased rates of opioid-related unintentional deaths have become one of the most prevalent health issues in the United States (Kimmel et al., 2017). This rate tripled from 1999 to 2014. Over 47,055 drug overdose deaths were reported in 2014, with 28,647 related to opioids (Tan et al., 2018). Throughout the United States, opioid use has become a chronic public health epidemic (Tan et al., 2018). Opioid-related overdose, abuse, and addiction is an increasing cost for the U.S. economy, estimated at 78.5 billion dollars annually, related to health care, substance abuse treatment, and loss of productivity (Tan et al., 2018). The nature of this DNP project was to explore evidence on the critical matter of pain control in hip and knee replacement surgery that avoids opioids in the postoperative period. Methods of controlling postoperative pain levels after hip and knee replacement surgeries to reduce the amount of opioid prescription abuse are essential to assess, especially in the current setting of the opioid crisis. The nature of the DNP doctoral project was to evaluate the evidence that supports the use of nonpharmacological methods of pain control in the postoperative period after hip and knee replacement surgery. Advocating for safer

methods of pain control can reduce the burdens of overprescribing opioids, which are a favorable means of social change for the population's needs. Social change is impacted by increasing education and collaborative relationships between healthcare providers and patients, thus building stronger relationships and decreasing the risks of liability related to overprescribing of medications. Control of the distribution and prescribing of opioid pain medication can reduce the number of healthcare dollars used to treat patients in clinics, hospitals, and treatment centers (Kertesz & Gordon, 2019). This type of reduction in healthcare spending allows for allocating those healthcare dollars to fund other health-related expenditures (Kertesz & Gordon, 2019). Advanced pain management strategies have the potential to enable patient access to high-quality, evidence-based care related to pain management, which can reduce the burdens of opioid use and opioid-related harms.

Problem Statement

The rates of opioid abuse, dependence, and addiction have dramatically increased over the past 3 decades, increasing risks for opioid-related mortality and morbidity. Prescribing opioid pain medications to older patients in the postoperative period following hip and knee replacement surgery can lead to opioid abuse and addiction. Opioids are the most frequently used method for controlling postoperative pain levels (Petre et al., 2012). Since the early 1990s, when opioids were first prescribed, the opioid abuse epidemic and increased rates of opioid-related unintentional deaths have become one of the most prevalent health issues in the United States (Kimmel et al., 2017). This rate tripled from 1999 to 2014. Over 47,055 drug overdose deaths were reported in 2014,

with 28,647 related to opioids (Tan et al., 2018). Throughout the United States, opioid use has become a chronic public health epidemic (Tan et al., 2018).

Over 51 million Americans undergo surgical procedures annually in the United States (Brummett et al., 2017). Opioids continue to be the primary method of postoperative pain control. Over 80% of these patients receive oxycodone or hydrocodone during this period. It continually concerns the association of postoperative opioid use and postoperative morbidity as well as mortality (Brummett et al., 2017). About 30% of these patients develop chronic pain and use opioids for an extended period after surgery (Brummett et al., 2017). Opioid use has increased dramatically in older patients undergoing surgical procedures in healthcare facilities throughout the United States (Kim et al., 2017). For example, hip and knee replacements are a common surgical procedure among older adults where opioids are prescribed for pain management. Opioids are used heavily during postoperative recovery, leading to opioid abuse and further addiction (Tan et al., 2018). Opioid-related overdose, abuse, and addiction is an increasing cost for the U.S. economy, estimated at 78.5 billion dollars annually related to health care, substance abuse treatment, and loss of productivity (Tan et al., 2018). Research on opioid prescribing estimated that in 2012 alone, pharmacies dispensed an average of 4.2 billion prescriptions, with 289 million being opioid analgesics, with the highest rates of prescribing for surgery, physical medicine/rehab, and medicine (Brummettt et al., 2017). Most overprescribing is for orthopedic surgeries, including hip and knee replacements (Levy et al., 2015). Patients undergoing corrective surgical procedures rate their pain higher, leading to an oversupply of prescribed opioids. Many

patients have their first experience with opioids in the postoperative period (Levy et al., 2015). For these reasons, orthopedic surgeries have been listed as the gateway to persistent opioid use, opioid dependence, and eventual opioid addiction.

Purpose

The use of nonpharmacological methods of pain control can allow nurses to adequately treat postoperative pain without increasing the chances of opioid addiction. This project is significant in nursing because it provides evidence that supports the use of nonpharmacological methods of pain control in the postoperative period after hip and knee replacement surgery. This could serve to help decrease the risks of opioid abuse, addiction, and opioid-related fatalities. This project provides evidence-based research to support the use of nonpharmacological methods of pain control following hip and knee replacement surgeries, that may provide better methods of controlling patients' pain levels. The project provides nurses with the knowledge to assist in reducing the increasing epidemic of opioid-related deaths. Nurses may use the data from this project to assist in assuring patient safety, improving quality of care, and reducing opioid-related injuries. Several interventions are proposed for use in the perioperative, intraoperative, and postoperative periods to manage pain. Many of these interventions continue to evolve, creating guidelines for postoperative pain management to promote evidence-based, effective, and safer postoperative pain management in these older adults (Chou et al., 2016). These interventions include education, pain management planning, pharmacological and nonpharmacological modalities, organizational policies and procedures, and outpatient transitioning (Chou et al., 2016). A review of the current

literature provided insight into whether these interventions were consistent with postoperative pain control. Identifying nonpharmacological methods of postoperative pain control following hip and knee replacement surgeries may reduce the amounts of opioid pain medications prescribed following hip and knee replacements, thus addressing the gap in practice.

Nature of the Doctoral Project

The opioid crisis is a global public health concern (Kolodny et al., 2015). As stated by the Centers for Disease Control and Prevention (CDC; 2018), over 130 Americans die every day due to opioid overdose. One of the U.S. Department of Health and Human Services goals is to advance better practices for pain management. Moreover, the National Institute of Health has researched methods to find safe, effective, nonaddictive strategies to manage pain. However, research on opioid prescribing estimated that in 2012 alone, pharmacies dispensed an average of 4.2 billion prescriptions, with 289 million being opioid analgesics, and with the highest rates of prescribing for surgery, physical medicine/rehab, and medicine (Brummettt et al., 2017). Most overprescribing is for orthopedic surgeries, including hip and knee replacements (Levy et al., 2015). Patients undergoing corrective surgical procedures rate their pain higher, leading to an oversupply of prescribed opioids. Many patients have their first experience with opioids in the postoperative period (Levy et al., 2015). For these reasons, orthopedic surgeries have been listed as the gateway to persistent opioid use, opioid dependence, and eventual opioid addiction.

Because this project was a systematic review, evidence for the project is discussed in the following section. This project was completed using a systematic review of literature that is listed as one of the acceptable types on the Doctoral of Nursing Practice resource page. To perform the systematic review, the John Hopkins nursing evidence-based practice model was used. I used a librarian to help obtain data. The doctoral committee served as the second reviewer. Existing scholarly literature from databases including Medline, Cochrane, PubMed, The Journal for Nurse Practitioners, Journal of the American Society of Nephrology, Geriatric Orthopedic Surgery & Rehabilitation, and American Journal of Preventative Medicine was obtained. The project was conducted following the guidelines set forth by Walden's Doctoral Project Committee. I used evidence from publications from 2014 to 2019. The project followed each of the methods outlined in the Systematic Review Manual for the Doctoral Nursing Project (Walden University, 2018). The evidence was critically appraised using the Melnyk Fineout-Overholt criteria. I then conducted an analysis of the data. Next, I interpreted the data and generated conclusions. In this doctoral project, I reviewed the evidence in the literature to support the use of nonpharmacological methods of postoperative pain control compared to the use of prescription opioids, thereby providing evidence on additional ways to control pain and addressing the gap in practice.

Significance

In this project, I explored the problem of postoperative hip and knee replacement opioid addiction. Nonpharmacological methods of pain control can reduce the amounts of opioids prescribed, thus reducing the risks of associated opioid addiction and abuse for

patients undergoing hip and knee replacement surgeries. The practice problem is supported by the CDC, the American Society of Addiction Medicine, and the World Health Organization on Substance Use. The CDC (2018) has reported that opioids are the most commonly used method for pain control in the postoperative period following orthopedic surgeries. The project question aligned with conducting a systematic review of the literature to explore the use of nonpharmacological methods of pain control. The analysis of the evidence was to support or negate nonpharmacological methods of reducing pain in older patients following hip and knee replacements. The project approach aligned with the project problem by exploring evidence related to nonpharmacological methods of pain control in the postoperative period following hip and knee replacement surgery. In this project, I sought to reduce the gap in research knowledge related to nonpharmacological methods of pain control in the postoperative period reducing the risk of opioid dependence, addiction, and abuse from opioid prescriptions. Prescription opioid abuse now accounts for more deaths than cocaine and heroin abuse each year. The World Health Organization (WHO) aims to combat the opioid epidemic. They have suggested that other methods of pain control be used for these patients, including nonpharmacological methods of pain control (WHO, 2017). In this project, I explored alternative methods for pain control after orthopedic surgery, addressing this serious issue. The doctoral project has potential transferability to other surgical arenas. It could potentially change how pain is treated in the postoperative period following other surgeries, such as gastrointestinal, cardiac, reproductive, and other orthopedic surgeries.

This project reinforces the mission of Walden University for increasing positive social change from the impact of the project on the identified population and advocation for patient safety (Walden University, 2019). Advocation for safer methods for pain control can reduce the burdens of overprescribing opioids, which are a favorable means of social change for the population's needs. Social change is impacted by increasing education and collaborative relationships between healthcare providers and patients, thus building stronger relationships and decreasing the risks of liability related to overprescribing of medications. Nonpharmacological methods to treat postoperative pain, such as exercise and guided imagery, can help decrease the cost of opioid prescriptions, leaving resources for alternative ways of managing pain. The project may positively change patient populations by reducing the risks of drug addiction and untimely deaths as well as assisting patients in making better choices related to pain control.

Summary

Opioids are heavily prescribed in the postoperative period for older adults undergoing hip and knee replacement surgeries. Overprescribing opioid medications leads to opioid abuse, addiction, and opioid-related fatalities. Opioid abuse and addiction is an ongoing health concern for the older population. The postoperative period is the period of time where many adults have their first encounters with opioids. There is insufficient knowledge of the use of nonpharmacological methods of pain control in the postoperative period for those older adults undergoing surgical hip and knee replacements. In this project, I evaluated the evidence in the literature that supports the use of nonpharmacological methods of pain control in the postoperative period, thereby

addressing the gap in practice. Databases were used to search for data that supported the use of nonpharmacological pain control methods, which can reduce the risks of opioid abuse, addiction, and fatalities related to overprescribing opioids in the postoperative period. The project is related to nursing as I sought to expand knowledge on the use of nonpharmacological methods of pain control for older patients undergoing hip and knee replacement procedures. Nurses strive to provide adequate care for patients, and successfully managing pain in the postoperative period aligns with these goals and reduces the substantial burden that the threat of opioids poses on patients, families, healthcare organizations, and the economy. Despite the data surrounding opioid-related deaths, prescription opioids are still heavily prescribed in the postoperative period following hip and knee replacement surgeries. There is an increasing rate of death associated with prescription opioids. In the next section of this project, I provide a rationale as to how Lewin's change model informed this project, provide clarification of any key terms used, give a detailed description of how the opioid epidemic is a significant public health concern, and demonstrate how this project is relevant to the field of nursing. The following section also details how the doctoral project team members were used and provides a description of how the project information was presented to the project team.

Section 2: Background and Context

Introduction

Prescribing opioid pain medications to older patients in the postoperative period following hip and knee replacement surgery can lead to opioid abuse and addiction. The project question asked whether a systematic review of the literature provided evidence to support nonpharmacological methods of pain control following hip and knee replacements in older adults compared to prescription opioids for pain control. The purpose of the project was to review the literature to support the use of nonpharmacological methods of postoperative pain control following hip and knee replacement surgeries compared to the use of prescription opioids, thereby reducing the risks of opioid prescriptions and reducing the risks of opioid abuse, addiction, and fatalities.

Concepts, Models, and Theories

Lewin's change model consists of unfreezing, changing, and refreezing (Udod & Wagner, 2018). The change model was applied to this doctoral project. In the first stage of unfreezing, the problem of the opioid epidemic has been clearly identified. This opioid epidemic places the population at risk for increased morbidity and mortality. A major problem of the opioid epidemic is that many of the initial opioid prescriptions are prescribed to patients following orthopedic surgeries. Patients who have their first encounter during the postoperative period can quickly become dependent on the medication for pain relief. Opioid dependence leads to abuse, addiction, and untimely opioid-related deaths. One of the vital concerns is that many patients are not given the

option of nonpharmacological methods, which has the potential to reduce increases in opioid prescriptions. The second component of the model is the change stage. This stage allows clinicians to use the information from the outcomes of this project where nonpharmacological methods are considered effective in controlling pain in patients undergoing total hip and knee replacement surgery. In the last stage, the evidence from research can be used to change the order sets for patients that are individualized to include nonpharmacological methods of pain control. Evidence support that opioid addiction and abuse is an ongoing public health concern. There is an urgent need for change to help prevent the prevalence of this health problem, which aligns with the first step of the change model. Increasing statistics of opioid-related deaths provide evidence that there is, in fact, a large problem. Researchers have also reported that many patients who suffer from opioid addiction and abuse are first introduced to opioids in the immediate postoperative period following surgical procedures, with hip and knee replacements listed as two of the most frequent (Hah et al., 2017). The second step of the model involves change. Reviewing the evidence that supports the use of nonpharmacological methods of pain control can help change perspectives on the treatment of pain in the postoperative period. The last step, which is unfreezing, entails making the new change a part of everyday practices to reduce the rates of prescription opioid addiction and abuse. Reviewing the evidence that supports the use of nonpharmacological methods of pain control in the postoperative period may reduce the risks of opioid abuse and addiction, which directly relates to the human, environment, health, and nursing.

Relevance to Nursing Practice

Over the past decade, opioid abuse has ranked number one as the leading cause of accidental death (Saluja et al., 2017). Opioid-related abuse, dependence, and fatalities are a major concern for communities, healthcare workers, providers, facilities, and society. Nurses are responsible for providing care and following physicians' orders in the postoperative period following hip and knee replacement surgeries. Nurses are essential to assisting patients to achieve their health goals following the hip and knee replacement procedure. Pain is a comfort measure that has the ability to hinder a patient's overall well-being. It is the obligation of nurses to ensure that all patient needs are met, including pain control. Adequate pain control can assist in providing comfort care for patients. Nurses strive to provide safe, efficient care to all patients. Gaining a greater understanding of other methods of pain control can assist with rendering this level of care. These goals are essentially critical in controlling postoperative pain for older patients undergoing hip and knee replacement surgeries. Many patients who have their first encounter with opioids in the postoperative period following hip and knee replacements increase the risks of subsequent opioid use (Rhon et al., 2018). Nurses are at the forefront of managing these patients' pain levels and should be well informed and educated on methods of controlling postoperative pain levels.

The project could potentially provide this education through evidence-based learning. Supporting the use of nonpharmacological methods of pain control may reduce the risks of prescription opioid abuse, dependence, and opioid-related fatalities, thus improving the quality of care these patients receive (Rhon et al., 2018). Nurses should be

able to recognize the benefits of safer methods of pain control (Rhon et al., 2018). Safer methods of pain control can assist nurses in transitioning patients from recovery to the previous level of function in a safe manner. Previous research studies have shown that nurses' perception of pain does not always correlate with the actual perceptions of pain from the patients (van Dijk et al., 2017). Many patients report pain levels of greater than a 4 on a 0 to 10 pain scale (van Dijk et al., 2017). In the clinical practice setting, nurses are responsible for treating pain levels greater than a 4 with analgesics (van Dijk et al. 2017). Pain relief in the postoperative period provides comfort for the patients and prevents complications such as pneumonia and thrombus formation. Pain control may be achieved in the postoperative period if patients are properly educated on pain control interventions. Increased patient knowledge on pain control influences behaviors by making changes to attitudes, knowledge, and skills needed to effectively manage postoperative pain levels (van Dijk et al., 2017).

The ongoing opioid crisis places emphasis on chronic health conditions that receive little to no attention: chronic pain and opioid addiction (Compton & Blacher, 2020). In the United States alone, 45% of the patients who use heroin report that their first encounters with opioids were from exposure to prescription opioids (Compton & Blacher, 2020). Prescription opioids play a pivotal role in opioid addiction serving as the "gateway" to more harmful opioids (Compton & Blacher, 2020). Patients who often overuse prescription opioids tend to use more illicit drugs in the long run, thus increasing the risks of opioid-related deaths. It is vital that nurses are able to intervene effectively in the opioid crisis. Considering that opioids are prescribed in the postoperative period to

control patient pain levels, nurses must understand opioid roles and safe and effective use. Nurses must also be able to recognize and manage problematic opioid use behaviors.

To manage patients' pain levels, nurses should be knowledgeable of the use of nonpharmacological means of pain control, thereby reducing the risks of prescription opioid use, misuse, abuse, and addiction. The use of nonpharmacological methods of pain control potentially reduces the introduction of the patient to opioids, thus reducing the chances of opioid abuse, addiction, and related fatalities. Increased knowledge by nurses on effective and safe means of pain control for patients in the postoperative period reduces the gap in nursing practice. This project provides nurses with the evidence-based information needed to potentially reduce the rates of abuse, addiction, and fatalities associated with opioids following hip and knee replacement surgeries. This project provided evidence from the literature to support the use of nonpharmacological methods of controlling reported pain from patients following the hip and knee replacement surgeries. From this project, nurses may be able to effectively manage postoperative pain without increasing the risks of overprescribing prescription opioids.

Local Background and Context

The opioid crisis is a global public health concern (Kolodny et al., 2015). The CDC (2018) reported that over 130 Americans die every day as a result of opioid overdose. There were approximately 52,404 lethal drug overdoses in 2015 (CDC, 2018). Of these overdoses, 40% were related to prescription opioids (CDC, 2018). Moreover, there was a 340% increase in opioids related prescription fatalities from 1999 to 2010

(CDC, 2018). The CDC has declared the prescription opioid abuse crisis a substantial public health issue requiring immediate attention because of the rising statistics.

The most commonly prescribed opioids in the United States are oxycodone and hydrocodone. Since 1999, the rates at which opioids are prescribed have quadrupled, which is parallel to the number of opioid overdoses. In the state of Mississippi, an average of 60% of the 310 drug overdose deaths for the state in 2018 were related to opioids. There were a total of 173 fatalities (CDC, 2018). This same year, providers in the state of Mississippi wrote 76.8 opioid prescriptions for every 100 patients (CDC, 2018).

Many patients have their first experience with opioids in the immediate postoperative periods following orthopedic procedures (CDC, 2018). Of these orthopedic procedures, hip and knee replacements are the most common (CDC, 2018). Older adults are the most affected population needing hip and knee replacement surgeries (Levy et al., 2015). In the National Prescription Audit between 2007 and 2012, 27% of patients' postoperative hip and knee replacements received opioids alone in 2006 and 10% in 2014 (Levy et al., 2015). Tan et al. (2018) revealed that among the patients who had never received opioids until surgery, over 4.3% were still using opioids 6 months after the total hip and knee replacement. The patients who received greater than 60 mg of oral morphine before surgery had an 80% chance of continued use in the postoperative period (Tan et al., 2018). However, using nonpharmacological methods of pain control can assist in controlling the global crisis of opioid abuse, dependence, and addiction (Chou et al., 2016). Nonpharmacological methods of pain control are aimed at reducing the use of

prescription pain medications. As the trends in opioid abuse continue to increase nationwide, finding other effective nonpharmacological modalities has now emerged as a top priority.

Role of the DNP Student

This project is of great significance to me in my role as a future provider. Most patients who become addicted to opioids are prescribed opioids by physicians and advanced healthcare providers such as nurse practitioners and physician assistants. Nurse practitioners need to be well educated on controlling the pain levels of all patients, including patients undergoing surgical procedures. Controlling postoperative patient reports of pain is of utmost importance to me in my role as a current bedside nurse working with postsurgical patients. Nurses are essential in the effort to reduce the opioid epidemic crisis that the world faces today. The goals set forth by the CDC (2018) aim to control the amounts of prescription opioids. It is imperative that providers change their prescribing behaviors in order to help reach these goals.

Many of the deaths and other opioid-related injuries could, in a sense, be considered preventable. My hope is that the rates of prescriptions for opioids can be reduced sufficiently by providing support for evidence-based nonpharmacological methods of pain control. Because I work on a postoperative unit, I experience the encounters of prescription opioid use by older patients following hip and knee replacements. These patients are more focused on reducing pain levels than anything. Most elective hip and knee replacement surgeries are a direct response to chronic pain. These patients are typically given opioids for sedation in the preoperative suite, opioids in

the immediate recovery area, and opioids once reaching the postsurgical unit. These patients are also given prescriptions for opioids on discharge. Increased exposure to opioids in the postoperative period increases the dependence on the medication in the recovery phase after discharge (Lespasio et al., 2019). Many patients continue to use the opioids after they have fully recovered because they explain that they cannot function without them (Lespasio et al., 2019). Many orthopedic surgeons only prescribe patients limited amounts of opioids on discharge, explaining that other means should be sought from primary care providers (Lespasio et al., 2019). This behavior places the primary care providers at risk for overprescribing and potential threats to licensure and business practices (Lespasio et al., 2019). My biases for this project include my strong beliefs and feelings against overprescribing. I believe that an increased number of opioids are prescribed in the postoperative period following orthopedic surgery. I also think that many patients take these medications simply because they are prescribed. If patients are educated on other nonpharmacological means of pain control, they will be more willing to use these means instead. Furthermore, I believe that patients' constant use of opioids in the postoperative pain period will make them more susceptible to use opioids following discharge. These biases have the potential to hinder the outcomes of my project by favoring information that supports my position on overprescribing opioids. To prevent the biases from interfering, I plan to maintain a neutral stance. As an advanced practitioner, in the future, I plan to adhere to prescribing practices currently in place, such as the use of prescription monitoring programs and by educating patients on the benefits of nonpharmacological methods of pain control.

Role of the Project Team

The project team for this doctoral project served many purposes. The purpose of a project team is to assist the student with the doctoral project. The project team worked with me throughout the course of the project by reviewing the data and approving each section in the process. The project team also assisted me in identifying and assessing the evidence to answer the project questions. My project team consisted of a Walden University librarian and the DNP project chair. The Walden librarian assisted in the search for scholarly articles in the library's database. The DNP project chair served as the second reviewer of the identified evidence and analysis of the findings. The project team approved the topic, made suggestions for corrections for each section, and helped me through the completion of the doctoral project.

Summary

Prescribing opioid pain medications to older patients in the postoperative period following hip and knee replacement surgery can lead to opioid abuse and addiction. The project question asked whether a systematic review of the literature provided evidence to support nonpharmacological methods of pain control following hip and knee replacements in older adults compared to prescription opioids for pain control. Lewin's change theory can be used to assist in changing the way pain is treated in the postoperative period. The project is of great importance in the field of nursing because nurses are responsible for providing safe, effective, cost-efficient care to all patients. Using evidence-based research on nonpharmacological methods of pain control after hip and knee replacements can assist nurses in providing this level of care to these patients.

This may reduce the risks of associated opioids prescribed, thereby reducing the risks of opioid abuse, addiction, and opioid-related fatalities (Levy et al., 2015). Current research findings have reported that there is a global crisis on opioids. The CDC (2018) aims to reduce this crisis by reducing the number of opioids prescribed. Research evidence has been analyzed to support the use of nonpharmacological methods of pain control following hip and knee replacement surgery. The local problem of opioid addiction and abuse after hip and knee replacement surgeries in older adults is discussed in the next section. The practice-focused question is identified along with the gap in practice that addresses the use of nonpharmacological methods of pain control following hip and knee replacement surgeries. In this section of the paper, I clarify how using nonpharmacological methods of pain control following total hip and knee replacement surgery in older adults can reduce the rates of opioid addiction, abuse, and opioid-related fatalities. In this section, the sources of evidence to address the practice-focused question are addressed as well as clarification of the relationship between nonpharmacological methods of pain control and reduced rates of opioid addiction and abuse.

Section 3: Collection and Analysis of Evidence

Introduction

Prescribing opioid pain medications to older patients in the postoperative period following hip and knee replacement surgery can lead to opioid abuse and addiction. Opioids are the most frequently prescribed means of treating pain in the postoperative period following hip and knee replacement surgery in older adults. Throughout the United States, opioids have become a major public health epidemic since they were first introduced in the 1990s (Gomes et al., 2018). Opioids are a major health concern because they often lead to addiction, abuse, and dependence. Opioid abuse and dependence following hip and knee replacement surgery increase the risk of opioid-related fatalities. However, identification of nonpharmacological methods to control postoperative pain following hip and knee replacement surgery can help reduce the amounts of opioids prescribed. The purpose of this project was to determine whether a systematic review of the literature provided evidence to support the use of nonpharmacological methods of pain control following hip and knee replacements in older adults as compared to prescription opioids for pain control.

Opioid use has increased dramatically in older patients undergoing surgical procedures. Hip and knee replacements are listed as one of the most common surgical procedures among older adults. Following the hip and knee replacement surgeries is where opioids are prescribed for pain management. Opioids are used heavily during postoperative recovery, often leading to opioid abuse and further addiction (Tan et al., 2018). Opioid-related overdose, abuse, and addiction is an increasing cost for the U.S.

economy, estimated at 78.5 billion dollars annually related to health care, substance abuse treatment, and loss of productivity (Tan et al., 2018)

In this section, I detail the problem of prescription opioids to older patients following total hip and knee replacement surgeries. I describe that opioids are heavily prescribed during this period to these patients to control reported pain levels. The use of opioids in this postoperative period has become the standard of care for most patients undergoing orthopedic procedures such as total hip and knee replacements. The gap in practice addressed whether nonpharmacological methods of pain control can be used to control the pain reported by these patients. The use of these nonpharmacological methods has the potential to reduce the burden of prescription opioid addiction, abuse, and untimely opioid-related deaths. In this section, I give a detailed description of how I used the systematic review of the literature to analyze the data that support the use of nonpharmacological methods of pain control following total hip and knee replacements in older adults. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis model was used to transparently report the systematic reviews of literature, which provides a summary of the main findings, including the strengths and limitations of the studies. The data were then analyzed using the John Hopkins model to appraise the level of evidence of each review.

Practice-Focused Question

There is a lack of knowledge on the use of nonpharmacological methods of pain control following hip and knee replacement surgeries in older adults. The review of existing literature provided insight into whether the literature supports the use of

nonpharmacological methods in controlling pain levels of older adults in the postoperative period. Prescription opioids are a major health concern throughout the population. Opioids are prescribed by health care providers, such as surgeons, physicians, physician assistants, and advanced practice clinicians. However, prescription opioids are a major health epidemic because of dependence, addiction, and abuse. In addition, addiction and abuse increase the risks of opioid-related fatalities. This problem is of major concern for older adults undergoing hip and knee replacement procedures. Opioids are prescribed in the postoperative period to control pain following hip and knee replacement surgeries. Many of these adults have their first encounter with opioids in this time period. Heavy use of prescription opioids following hip and knee replacement surgery increases the risks of overuse after discharge. This practice by older adults increases the risks of dependence, abuse, and addiction. However, there has not been much use of more scholarly voice research that supports other means of treating postoperative pain following hip and knee replacement surgeries in older adults. The gap in practice that this project addressed is whether the evidence supports nonpharmacological methods of pain control in older patients with hip and knee replacements, as compared with prescription opioids for pain control. The project question asked whether a systematic review of the literature provided evidence to support nonpharmacological methods of pain control following hip and knee replacements in older adults compared to prescription opioids for pain control. If nonpharmacological methods are used, then fewer opioids can be prescribed, thus reducing the risks of opioid abuse, addiction, and fatalities.

In this project, I sought to increase knowledge surrounding nonpharmacological methods of pain control following hip and knee replacement surgery, thus guiding future care of managing patients' pain. Nonpharmacological can be defined as measures used in the management of pain that are not medications (El Geziry et al., 2018). Nonpharmacological methods are not readily used because there is a lack of knowledge on their effectiveness. Nonpharmacological methods can be used to safely manage pain as opposed to opioids in the postoperative period.

Sources of Evidence

Existing scholarly literature from databases including Medline, Cochrane, PubMed, The Journal for Nurse Practitioners, Journal of the American Society of Nephrology, Geriatric Orthopedic Surgery & Rehabilitation, and American Journal of Preventative Medicine was reviewed for evidence that supports the use of nonpharmacological methods of pain control following hip and knee replacement surgeries in older adults. The opioid crisis is a global public health concern (Kolodny et al., 2015). According to the CDC (2018), over 130 Americans die every day as a result of opioid overdose. The United States Department of Health and Human Services' goals are to advance better practices for pain management. The National Institute of Health has researched methods to find ways to safe, effective, nonaddictive strategies to manage pain. Research on opioid prescribing estimated that in 2012 alone, pharmacies dispensed an average of 4.2 billion prescriptions, with 289 million of them being opioid analgesics, with higher rates from surgery, physical medicine/rehab, and medicine (Brummettt et al., 2017). Most of the overprescribing comes during orthopedic surgeries, including hip and

knee replacements and knee replacements (Levy et al., 2015). Patients who undergo corrective surgical procedures often rate their pain at higher levels, leading to an oversupply of opioids prescribed. For these reasons, orthopedic surgeries have been listed as the gate to persistent opioid use, opioid dependence, and eventual opioid addiction. In the postoperative recovery period, most of these patients receive their first experience with opioids (Levy et al., 2015). Nurses who render care to these patients in the postoperative period are responsible for assessing and managing pain and a reevaluation of pain. Nurses are more prone to using prescription opioids because they lack knowledge of the nonpharmacological methods of pain control and their effectiveness.

Analysis and Synthesis

Analysis of the research data provided evidence to support the use of nonpharmacological methods of pain control and its effectiveness, thus providing knowledge to guide future protocols and reducing the risks of opioid use, abuse, and addiction. For the systematic review of literature, I examined databases to collect relevant data. The project was conducted by the guidelines set forth by Walden's Doctoral Project Committee. I used evidence in the databases from publications between 2014 and 2019. The project followed each of the methods outlined in the Systematic Review Manual for the Doctoral Nursing Project (Walden University, 2018). I completed this project using a systematic review of literature, which is listed as one of the acceptable types on the Doctoral of Nursing Practice resource page. To perform the systematic review, a PRISMA chart was used to organize the articles. I gained permission to use the John Hopkins nursing-based practice model. An analysis of the data was then conducted by

assessing the quality of the evidence. I assigned the level of evidence based on quality from Levels I through V. The next step required the research to be appraised using the research evidence appraisal tool.

Evidence has suggested that nonpharmacological methods of pain control are effective at managing postoperative pain. With input from the American Society of Anesthesiologists, one study conducted by the American Pain Society commissioned an interdisciplinary expert panel to develop a clinical practice guideline to promote evidence-based, effective, and safer postoperative pain management in children and adults (Chou et al., 2016). The panel had recommendations such as the use of patient education to help manage pain levels, multimodal analgesics, and nonpharmacological modalities of pain control. Individually tailored education and support programs for patients who undergo surgery are associated with beneficial effects, including reduced postoperative opioid consumption, less preoperative anxiety, fewer requests for sedative medications, and reduced length of stay after surgery. Multimodal analgesia, which might also be combined with nonpharmacological interventions, might have additive or synergistic effects and more effective pain relief compared with single-modality interventions. Physical modalities included transcutaneous electrical nerve stimulator, acupuncture and related interventions, massage, cold therapy (with and without compression), localized heat, warm insufflation, continuous passive motion, and immobilization or bracing. Evidence from the literature revealed that these therapies are generally considered to be safe and effective as adjunctive therapies as part of a multimodal approach to postoperative pain management (Chou et al., 2016).

In another study, researchers aimed to study age-related differences in pain, opiate use, and opiate side effects after total hip and knee or knee arthroplasty in patients 60 years old or older (Petre et al., 2012). The researchers found that for patients undergoing joint replacements, pain scores seemed to be the same for patients aged 60 to 79 years and for those who were older. However, the amounts of opiates needed to achieve these pain scores were significantly less in the older group. Despite using fewer opiates, the older group was at higher risk of the complications associated with opiates (Petre et al., 2012).

Research studies have shown that nonpharmacological methods of pain control are useful in controlling postoperative pain levels (Tick et al., 2018). However, these nonpharmacological methods are underused. Petrie and Matzkin (2019) sought to find if nonpharmacological and pharmacological sleep aids can reduce postoperative pain and opioid use. They stated that due to the opioid epidemic currently occurring, it is integral that orthopedic surgeons find alternate ways to help patients manage their pain. Research has also shown that sleep and lack of sleep play a pivotal role in patients' perception, tolerance, and ability to deal with their pain (Petrie and Matzkin, 2019). One means available to assist orthopedic surgeons in decreasing opioid prescribing is to encourage better sleep in their patients, especially in the postoperative period. The researchers suggested the use of cognitive behaviors therapy as a nonpharmacological means of controlling postoperative pain. They also suggested that more research is needed to support the use of Zolpidem as a pharmacological means as opposed to opioid therapy (Petrie & Matzkin, 2019).

The databases and search engines that were used included MEDLINE, American Journal of Public Health, PubMed, and Elsevier Journals. The list of key search terms and combinations of search terms used included *opioid epidemic, total hip and knee arthroplasty, opioid related-deaths, opioid abuse, opioids, pain control, nonpharmacological pain control, postoperative pain management, education, clinical practice guidelines, analgesia, injuries, music, video, guided imagery, relaxation,* and *breathing exercises*. The search yielded an abundance of results that included the most recent data within the past 5 years and evidence that is more directly related to the practice-focused question. The sources of evidence were from different scholarly databases, with the most supportive evidence from the American Journal of Preventative Medicine, CDC, and The Journal for Nurse Practitioners.

There were several steps taken to conduct the systematic review of the literature. The first step was to define a practice problem in this area. From this problem, I formulated the research question. Once the question had been approved to be studied, the research was then conducted. I conducted the research by finding journal articles and studies on the subject of nonpharmacological methods of pain control following hip and knee replacement surgeries in older adults. In order to find scholarly articles, different journal databases were searched using the inclusion of opioids, nonpharmacological methods of pain control after hip and knee replacements, older adults, and systematic review. The Walden librarian assisted me in running a preliminary search strategy on existing scholarly literature from databases, including Medline, Cochrane, PubMed, The Journal for Nurse Practitioners, Journal of the American Society of Nephrology, Geriatric

Orthopedic Surgery & Rehabilitation, and American Journal of Preventative Medicine. The databases revealed evidence from publications from 2014 to 2019. Each article was reviewed and examined using the PRISMA checklist to improve the transparency of the systematic reviews; the PRISMA checklist was designed to assist researchers in identifying, selecting, appraising, and synthesizing research studies. The PRISMA checklist covers aspects of the reviews, such as the title, abstract, introduction, methods, results, discussion, and findings (Page et al., 2021). This information was placed in a table. The John Hopkins model was used to grade the level of evidence for each article and its findings from the table. The John Hopkins model was designed to give nursing researchers a 3-step process to ensure that the latest research findings and best practices are incorporated into patient care (John Hopkins University, 2021). The doctoral committee served as the second reviewer.

Protections

The Institutional Review Board (IRB) was responsible for ensuring that the doctoral project research complied with Walden University's ethical standards and the United States federal regulations standards. After the research proposal was completed and accepted, the University's Research Review Board invited me to complete Form A. Form A was completed to obtain permission from the IRB. Individual identifying data were not used in this project because individual subjects were not included in this systematic review. Human subjects were not used to conduct research for this doctoral project. Instead, the information obtained was from literature reviews, systematic reviews, and meta-analysis studies on subjects within a hospital or medical center. This

project did require the consent of participants to summarize the research findings. In each study analyzed, treatment was not withheld from any participants. The findings of the studies were the direct result of different approaches used to treat and manage reported pain levels. The Walden University IRB board served as the regulating body to ensure patient safety and data protection. The IRB board has the authority to approve, require modifications, or disapprove research related to this project.

Summary

Systematic reviews are used to summarize the evidence related to the efficacy and safety of nonpharmacological methods of pain control in older adults following hip and knee replacement surgery. The deficit in poor reporting of systematic reviews of literature reduces the value of the information of outcomes and lessens the usefulness of the data in daily clinical practice. For this reason, the PRISMA method was used to allow readers to assess the strengths and weaknesses of the literature. The PRIMA method ensures transparency and a complete report. In the next section, I discuss the results of the systematic review of literature to determine if the review supported the use of nonpharmacological methods of pain control following hip and knee replacement surgery in older adults. The implications for future practice generated from the research findings are reported. Recommendations for the use of this information in future practice are also included.

Section 4: Findings and Recommendations

Introduction

The local clinical practice problem that this project addressed was the opioid epidemic. An increased number of opioids is prescribed in the postoperative period following hip and knee replacement surgery in older adults. This increase in opioid prescriptions has increased the risks of opioid abuse, dependence, addiction, and opioid-related fatalities. It is estimated that there are nearly 38 opioid-related fatalities every single day (CDC, 2020). Many of the opioids that are misused are from prescription opioids after orthopedic procedures, with knee and hip replacements being the most common. Other methods, including nonpharmacological methods of pain control, may be used to control pain levels in the postoperative period following hip and knee replacement surgeries. In this project, I evaluated the evidence in the literature that supports the use of nonpharmacological methods of pain control in the postoperative period, thereby addressing the gap in practice. The project question asked whether a systematic review of the literature provided evidence to support nonpharmacological methods of pain control following hip and knee replacements in older adults compared to prescription opioids for pain control.

Upon obtaining Walden University IRB approval (approval number 09-23-21-0622542), I conducted a systematic review of the literature to identify the evidence related to nonpharmacological methods of pain control following hip and knee replacement surgery in older adults. The literature was coordinated with the clinical practice question that was established for this project. Inclusion and exclusion criteria

were used to ensure that the quality of the evidence was high. The inclusion and exclusion criteria were also used to provide evidence to support nonpharmacological methods of pain control after hip and knee replacement surgery. The literature databases searched included MEDLINE, American Journal of Public Health, PubMed, and Elsevier Journals dated between 2014 and 2019. The list of key search terms and combinations of search terms used included *opioid epidemic, total hip and knee arthroplasty, opioid related-deaths, opioid abuse, opioids, pain control, nonpharmacological pain control, postoperative pain management, education, clinical practice guidelines, analgesia, injuries, music, video, guided imagery, relaxation,* and *breathing exercises*. The search criteria also included peer-reviewed journals articles. The project did not include any human subjects and did not involve the collection of patient identifiers. No patient data were used in the final project. The project was aligned with the Walden University Manual for Systematic Review and may benefit nurses, the organization, and patients undergoing total knee and hip replacement surgeries.

Findings and Implications

There was an extensive search of the current literature to find evidence to support the use of nonpharmacological methods of pain control following hip and knee replacement surgery in older adults. Figure 1 is the PRISMA flowchart for the systematic review, which identifies the number of articles reviewed in the completion of this project. A total of 929 articles were selected for title and abstract review. Of these articles, 640 were excluded, and 49 articles were retained for full-text review. Upon further analysis, nine articles met the inclusion criteria. Table 1 is a summary table of analyzed articles

that met the inclusion criteria. In addition, this table shows the evidence used in each article as well as the level of the evidence. To ensure the integrity of the evidence, the research was conducted in alignment with the guidelines set forth by the Walden University Manual for Systematic Review, and the findings reported are solely based on the evidence. The John Hopkins model was used to perform a critical appraisal of the evidence found during the literature search. The model is used to help determine the value and trustworthiness of each article. Each article was assigned a level of evidence from I through IV. Once the levels were assigned to each article, they were placed in a table of evidence (Table 1. The table allowed for the organization and synthesis of the results.

Figure 1

Prisma Flow Chart

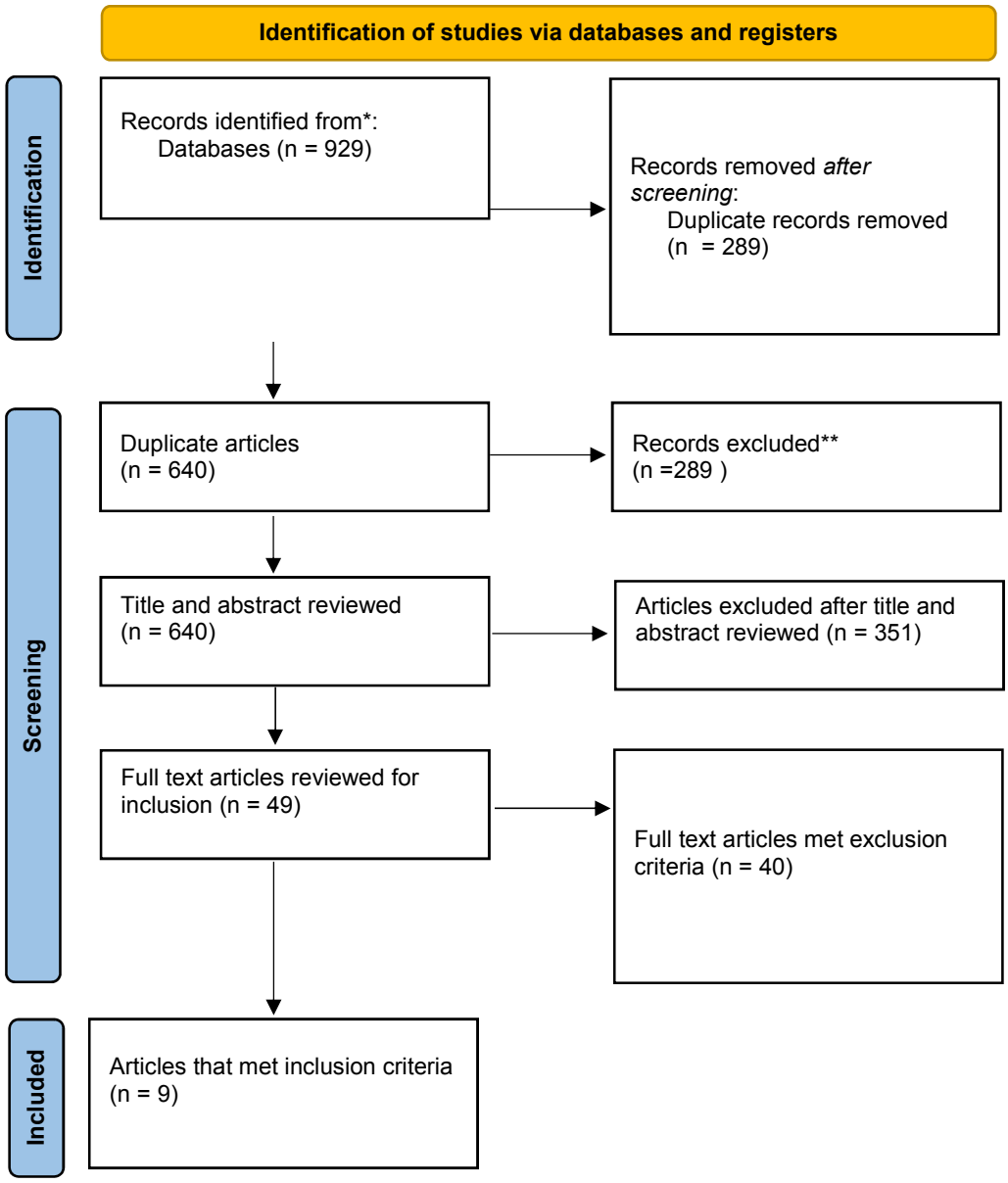

Table 1

Analysis of the Evidence

Citation	Main findings	Research method	Strengths	Weaknesses	Level of evidence
Chughtai, M., Elmallah, R. D., Mistry, J. B., Bhave, A., Cherian, J. J., McGinn, T. L., & Mont, M. A. (2016). Nonpharmacologic pain management and muscle strengthening following total knee arthroplasty. *The journal of knee surgery*, *29*(03), 194-200.	Demonstrated that neuromuscular electrical stimulation, prehabilitation, and some specialized exercises are beneficial for postoperative muscle weakness and that TENS, cooling therapy, and compression may help alleviate post TKS pain.	Literature review	A comparison of different nonpharmacological pain modalities.	Small sample sizes	1
Lespasio, M. J., Guarino, A. J., Sodhi, N., & Mont, M. A. (2019). Pain management associated with total joint arthroplasty: a primer. *The Permanente Journal*, *23*.	Use of both opioid and nonopioid medications to target central mechanisms involved in the perception of pain may reduce a patient's dependence on. Single medication and reduce or eliminate the need for opioids.	Clinical practice guidelines	Individualized approach for each patient	There is no documentation of multimodal treatment failures.	IV
Botti, M., Kent, B., Bucknall, T., Duke, M.,	A multimodal approach including opioid and	Systematic review of randomized control trials	Large sample size. Discusses the need to	Conducted in a private hospital setting.	I

Johnstone, M. J., Considine, J., ... & Cohen, E. (2014). Development of a Management Algorithm for Post-operative Pain (MAPP) after total knee and total hip replacement: study rationale and design. *Imple mentation science*, *9*(1), 1-11.	nonopioid medications that are tailored for each patient is proven beneficial in controlling postoperative pain after total knee and hip replacement surgery.		implement evidence based research into standard daily practice		
Padilla, J. A., Gabor, J. A., Schwarzkopf, R., & Davidovitch, R. I. (2019). A novel opioid-sparing pain management protocol following total hip arthroplasty: effects on opioid consumption, pain severity, and patient-reported outcomes. *The Journal of arthroplasty*, *3 4*(11), 2669-2675.	Opioid-sparing protocol reduces opioid consumption and provides equivalent pain management and patient-reported outcomes during the 90-day THA episode of care relative to a traditional opioid-based regimen	Retrospective study	The data suggests that protocols for pain management in the post-operative period should be used.	No description of nonopioid intervention was available.	II
Petre, B. M., Roxbury, C. R., McCallum, J. R., DeFontes III, K. W., Belkoff, S. M.,	The amounts of opiates needed to achieve these pain scores was significantly	Retrospective review	Evidence from study reveal that patient controlled analgesic pumps used in the first day	Bias could exist in prescribing patterns of practitioners and dosing	II

& Mears, S. C. (2017). Pain reporting, opiate dosing, and the adverse effects of opiates after hip or knee replacement in patients 60 years old or older. *Geriatric orthopaedic surgery & rehabilitation*, *3*(1), 3-7.	less in the older group. Despite using less opiates, the older group was at higher risk of the complications associated with opiates		post-operative may reduce the need for further opioids on following days.	patterns of nurses	
Parvizi, J., & Bloomfield, M. R. (2018). Multimodal pain management in orthopedics: implications for joint arthroplasty surgery. *Orthopedics*, *36*(2), 7-14.	A comprehensive, multimodal analgesia strategy provides effective pain control in the majority of patients, while limiting adverse effects and facilitating rapid rehabilitation	Cohort study	Nonnarcotic medications are an integral part of our multimodal approach	Many institutions do not used the same protocols for nonopioid treatment options.	II
Tedesco, D., Gori, D., Desai, K. R., Asch, S., Carroll, I. R., Curtin, C., & Hernandez-Boussard, T. (2017). Drug-free interventions to reduce pain or opioid consumption after total knee arthroplasty: a systematic review and meta-	Electrotherapy and acupuncture improved postoperative pain management and reduce opioid consumption.	Meta analysis	Large cohort size	Small number of studies for the meta analysis Unclear risks of bias	!

analysis. *JAMA surgery*, *152*(10), e172872-e172872.					
Daniels, S. D., Garvey, K. D., Collins, J. E., & Matzkin, E. G. (2019). Patient satisfaction with nonopioid pain management following arthroscopic partial meniscectomy and/or chondroplasty. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, *35*(6), 1641-1647.	Patients who undergo arthroscopic partial meniscectomy and/or chondroplasty can achieve satisfactory pain control with nonopioid pain management.	Prospective study	Pain control strategies should emphasize proper patient education to safely maximize the use of nonopioid pharmacotherapy such as NSAIDs and other anti-inflammatory agents where appropriate	The way the patients were group for pain satisfaction analysis may be a limitation	II
Fan, M., & Chen, Z. (2020). A systematic review of non-pharmacological interventions used for pain relief after orthopedic surgical procedures. *Experimental and therapeutic medicine*, *20*(5), 1-1.	Studies conclude that the current evidence from studies indicate that there may be a potential role of nonpharmacological interventions including relaxation therapy, guided imagery, music and audio-visual distraction in patients after orthopedic procedures.	Systematic review	Low risk of bias	Quality of the studies used was not high	I

The review of the literature yielded insights on the use of nonpharmacological methods of pain control following hip and knee replacements in older adults. The systematic review of literature provided answers to the research question of whether nonpharmacological methods of pain control are effective at managing postoperative pain in older adults undergoing hip and knee replacement surgery. The research yielded results that support nonpharmacological methods of pain control in postoperative pain experienced by older adults undergoing hip and knee replacement surgery (Chughtal et al., 2016). These nonpharmacological methods include but are not limited to transcutaneous nerve stimulation, relaxation techniques, and therapeutic exercises (Chughtal et al., 2016). Data also suggest that in order for these interventions to be successful, a thorough review of the patient's medical and social history and any experiences with opioids for other conditions should be reviewed (Lespasio et al., 2019). Each plan of care for pain management in the postoperative period should be tailored based on the information obtained. The systematic review also revealed that a multimodal approach including nonpharmacological methods in combination with opioids at the lowest dosage is more effective in managing pain in older adults undergoing hip and knee replacement surgery (Botti et al., 2014). Using the multimodal approach, these patients used fewer opioids and reported better pain control in the postoperative period. Researchers also suggested that effective dosing of Acetaminophen and other nonsteroidal ant-inflammatory analgesics given in the postoperative period has led to a reduction in the amounts of opioids used in the postoperative period (Padilla et al., 2019).

There were nine studies that supported the use of nonpharmacological methods of pain control to reduce the number of prescription opioids prescribed. Chughtai et al. (2015) found that neuromuscular electrical stimulation, prehabilitation, and some specialized exercises are beneficial for postoperative muscle weakness, and transcutaneous electrical nerve stimulation, cooling therapies, and compression may be helpful to alleviate postoperative pain. The authors described that physical therapy sessions prior to the surgery improve outcomes after the surgical procedure. The researchers found that 86% of the patients reported that transcutaneous electrical nerve stimulation helped control their pain level postsurgery. There was a lower mean visual pain score in the patients who received cooling therapy sessions on Days 1 to 6 compared to those of the control group. Researchers have concluded that neuromuscular electrical stimulation can control postoperative pain with other advantages, including lower risks for side effects and decreasing the amount of adjunct prescription pain medication (Chughtai et al., 2015).

Lespasio et al. (2019) demonstrated that clinicians should develop individualized treatment approaches for pain management, including multimodal therapy. This multimodal approach includes nonpharmacological pain control and opioid medication at the lowest dosage. The authors revealed that a multimodal approach helps target pain receptor site pathways, reducing the potential for dependence on one particular medication and reducing the need for opioids altogether in the postoperative period. The evidence from the literature has revealed that patients of different ages groups do not require the same amounts of opioids to control postoperative pain. The evidence has also

revealed that elderly patients are typically prescribed pain medication for other conditions, increasing the risks of exposure to opioids. Risk stratification systems can assist with identifying those patients who are at greater risks for opioid abuse and dependence. In conclusion, multimodal approaches are effective in the management of postoperative pain management, thereby reducing the risks of dependence on one single opioid.

The Botti et al. (2014) study revealed that the best practice recommendation for postoperative pharmacological pain management requires a multimodal approach. The multimodal approach includes both the use of weaker and stronger analgesics given locally and systemically. The studies show that developing and implementing a Management Algorithm for postoperative pain control will support evidence-based pain management. It is concluded that the participants who were treated on the postoperative unit utilizing the algorithm developed to manage postoperative had a reduction in pain levels. This study also suggests that orthopedic patients had fewer complaints of pain ten weeks post-surgery, thus reducing the risks of long-term opioid use.

Padilla et al. (2019) demonstrated that treatment approaches that do not include opioids reduce postoperative opioid use. The study consisted of two groups of patients undergoing orthopedic procedures in an inpatient setting. The study revealed a significantly lower consumption of opioids in the opioid-sparing group when compared to the group that received opioid analgesics for pain management. Also, the opioid-sparing group received fewer opioids post-discharge when compared to the traditional cohort group. The traditional cohort group received morphine medication to control

reported pain. In conclusion, reducing the amounts of opioids given in the postoperative period and increasing the use of nonpharmacological methods can assist with decreasing the risks of adverse events in the postoperative period in patients undergoing knee and hip replacement surgeries. Petre, Roxbury, and McCallum (2017) investigated whether elderly patients need a separate set of pain orders with lower doses to avoid complications associated with opiate use in the postoperative period following knee and hip replacement surgeries. Opioid-related complications include but are not limited to delirium, constipation, urinary retention, and respiratory depression (Petre, Roxbury & McCallum, 2017). In elderly patients, delirium was 3.7 times higher, constipation was 3.2 times higher, and urinary retention was 1.5 times higher in those patients who received opioids. The study also demonstrated that older adults require fewer opioids than younger adults undergoing similar procedures in the postoperative period. In conclusion, the use of non-opioid related treatments is recommended to control postoperative pain in older adults undergoing hip and knee surgeries with fewer opioid-related side effects.

Parvizi and Bloomfield (2018) studied the use of multimodal pain modalities following hip replacement surgeries. Standard clinical practice guidelines include the use of high-dose opioids in the form of patient-controlled analgesia. The multimodal approach studied by the authors included the use of several interventions that target pain pathways post-surgery. The multimodal approach includes the use of nerve blocks, spinal anesthesia, oral analgesics in the lowest dosages in combination with non-opioid interventions. The multimodal interventions were successful at reducing pain without the adverse side effects of opioid-related complications. Oral analgesics include nonsteroidal

anti-inflammatory agents and Cyclooxygenase-2 inhibitors. The study concluded that there was a significant improvement in postoperative pain and increased walking distance in patients that received the multimodal approach when compared to those who received traditional treatment modalities. This has also decreased narcotic consumption and decreased length of stay.

Tedesco et al. (2017) studied whether nonpharmacological interventions are effective at managing postoperative pain following total knee arthroplasty are effective. The most common nonpharmacological interventions performed included cryotherapy, electrotherapy, continuous passive motion, acupuncture, and preoperative exercise. In a study conducted on 2,391 patients, the evidence suggests moderate certainty that electrotherapy and acupuncture reduce or delay opioid consumption. Studies also showed that cryotherapy reduces opioid consumption but does not, in fact, improve postoperative pain levels. Electrotherapy reduced the consumption of morphine by 95% per 48 hours. Acupuncture delayed opioid use by approximately 50 minutes. Continuous passive motion reduced opioid consumption by 95% even in weeks one and two postoperatively. The studies conclude that the evidence from research does support the use of nonpharmacological methods of pain control following knee replacement surgeries.

Daniels et al. (2019) studied the efficacy of non-opioid pain medication in the control of postoperative pain levels. The authors also studied whether patients were satisfied with pain control. There were 163 patients in the study with a mean age greater than 48. Patients received ibuprofen and Acetaminophen preoperatively and postoperatively. The study demonstrated that the true rate of satisfaction while taking a

non-opioid regimen was 81.6%. The findings also suggest that a greater majority of patients undergoing simple knee arthroscopy may be successfully managed with a non-opioid pain medication, including ibuprofen and other common anti-inflammatory agents. It is concluded that patients undergoing total knee replacements can achieve effective pain management with non-opioid treatment modalities.

Fan and Chen (2020) performed a review to evaluate the available evidence on the efficacy of various nonpharmacological interventions to relieve pain after orthopedic surgical procedures. The results of the present review indicated that several different strategies of nonpharmacological interventions had been used in orthopedic patients, and all such complementary therapies may have certain benefits in the reduction of postoperative pain. The most commonly used pain medications after any surgical procedure are NSAIDs and opioids. Adverse effects of NSAIDs include gastric ulcers, bleeding complications, and kidney injury. Studies show that the use of NSAIDs may inhibit fracture healing in orthopedic practice. Opioids, on the other hand, may have adverse effects, including physical dependence, tolerance, respiratory depression, vomiting, and constipation. It has been demonstrated that relaxation therapy is able to provide pain relief by decreasing anxiety, lowering muscle tension, and distracting the patient. In conclusion, studies show that there may be a potential role of nonpharmacological interventions, including relaxation therapy, guided imagery, music, and audio-visual distraction, in the pain management of patients with orthopedic surgery.

As the population ages, the need for advances in healthcare will continue to increase. One of these advances is the need for social change. Social change can be

defined as changes in human interactions and relationships that transform cultural and social institutions within a healthcare organization. Social change can include changes in behavioral rules and the value system. This process has the potential to influence changes within the organization that advocate for safer standards of practice for our patient population. Advocating for safer methods for pain control can reduce the burdens of overprescribing opioids, which are a favorable means of social change for the population's needs. Safer prescribing practices have the potential to reduce the economic burden of increased treatment for opioid-related illnesses and fatalities, increased lengths of hospital stays, and loss of productivity from work. Changing the standards of practice regarding the treatment of pain in older adults after hip and knee replacements advocates for safer patient practices. This reduction can help reduce the risks of increased exposure to opioids during inpatient stays, thus having the potential to decrease the likelihood of long-term opioid dependence. Not only can this reduction in opioid prescriptions assist this organization, but it also has the potential to help other facilities and hospital organizations.

Recommendations

Although interventions in place do not consist of opioids to control postoperative pain experienced in older patients following hip and knee replacements, there is still an increased amount of opioids used. Based on the information from this systematic review, there should be protocols in place on the postoperative unit to manage pain reported by patients following hip and knee replacement surgery. The information concluded from this review shows that nonpharmacological methods of pain control such as physical

exercises and non-opioid analgesics are effective at controlling postoperative pain. Additionally, these results give support for establishing new protocols for pain control in this population using nonpharmacological methods of pain control in combination with pharmacological means. The evidence suggests that each plan should be tailored to the specific needs of each based on a number of different factors. These factors include comorbid conditions, history of substance or alcohol abuse, history with opioid medications, and other medication regimes.

Based on the information concluded from the review of literature, post-operative treatment guidelines can be tailored to each patient. Patients may be screened using the opioid risk tools that determine patient risk categories for chronic opioid use based on history. Other tools that may be used to help establish new protocols include the opioid prescribing mapping tool created by the Center for Medicare services Lespasio et al., 2019). Additionally, to successfully implement the use of nonpharmacological methods of pain control into standard practice, there needs to be extensive education to physicians, nurses practitioners, nurses, other clinical staff, patients, and families on the safe and effective use. The nonpharmacological methods of pain control reduce the need for long-term opioid use, thus reducing the risks of opioid abuse, dependence, and opioid-related fatalities.

Contribution of the Doctoral Project Team

The project team for this doctoral project served many purposes. The project team assisted the student with the entire doctoral project. The course chair reviewed the project through each step to make sure that it met the guidelines established in the systematic

review manual. The course chair worked with the student throughout the course of the project by reviewing the data and approving each section in the process. The DNP Project chair served as the second reviewer of the identified evidence and analysis of the findings. The project team also consisted of the Walden librarian. The Walden librarian assisted in the search for scholarly articles in the library's database. The Project Team approved the topic, made suggestions for corrections for each section, and helped the student through the completion of the doctoral project.

Strengths and Limitations of the Project

The project was a systematic review of the literature to support the use of nonpharmacological methods of pain control following hip and knee replacements in older adults. There were nine articles found that met the inclusion criteria to answer the project question. Many of the articles yielded similar results on which interventions are most effective at controlling postoperative pain in older adults after these procedures. The number of articles that met both inclusion and exclusion criteria was limited for the defined population. Many of the articles found included several different age groups, including young adults. Therefore there is a need to conduct further research on the older adult population considering the fact that this age group is greatly affected by increased risks of falls and increased osteoarthritic changes. There is also the need for research studies that only used nonpharmacological interventions. The avoidance of heavy opioid prescribing in the postoperative period with the utilization of nonpharmacological pain control options can assist in combating the opioid epidemic.

Section 5: Dissemination Plan

The dissemination of evidence-based findings is an essential element in nursing research studies. Dissemination can be described as the distribution of information to a targeted specific public health or clinical practice audience. Evidence dissemination aims to spread knowledge and provide new ideas, interventions, and methods of providing care in daily practices. One large sector of evidence dissemination is communication. The information will be presented to physicians, nurse managers, nurse educators, advanced practitioners, and other staff members at the facility where the practice-focused question was created. The information will also be available to share with the other facilities under the umbrella of this major healthcare organization.

Analysis of Self

I am guided by the essentials of the doctor of nursing program (see American Association of Critical Care, 2006). By completing this project, I am able to conduct a thorough research study and analyze the results as a scholarly practitioner. I am fully capable of rendering results and disseminating the evidence to the proper stakeholders. I can take the information from this project and apply it to my patient population to improve patient health outcomes. The outcomes of the project, which have the power to change the standards of daily practice, motivated me to complete this project. My commitment to the well-being of the patients has improved my leadership skills to focus on safer standards of practice to assist patients in reaching healthcare goals.

Summary

Based on the findings of the gathered research, nonpharmacological methods of pain control are effective at controlling pain in the postoperative period following hip and knee replacement surgeries in older adults. I recommend that nonpharmacological methods of pain control be combined with opioid medications at lower doses for a multimodal approach. I also suggest that each pain treatment plan be tailored for each patient based on risks factors such as age, social history, and comorbid conditions. Using the evidence from this project can change the protocols in place to change the way the postoperative nurses manage postoperative pain, thus reducing the risks of opioid abuse, dependence, and opioid-related fatalities. Changing the trajectory of pain management can help improve patient health outcomes, thereby effecting social change. This information can be used in this healthcare system as well as other health organizations that perform hip and knee replacement procedures in older adults. Changing the way pain is managed in the postoperative period with the use of nonpharmacological methods of pain control can be one of the first steps needed to help fight the opioid epidemic.

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