

Literature Review of Pain Management Techniques and Tools in Geriatric Population

Sharfaa Chowdhury

Oakland University

Abstract

This is a literature review of current articles and data available on the experiences, pharmacological interventions and non-pharmacological interventions available to treat chronic non-cancerous pain of the geriatric population within the last ten years. The objective of this research is to identify what tools and techniques are being used to assess patient pain levels, what types of pharmacological interventions are being used to treat the pain, and whether the pharmacological interventions are as effective as the non-pharmacological interventions. The research includes the review of seventeen articles gathered through online databases and focuses on three key areas: patient experience, pharmacology, alternative therapy. The research shows that there are many barriers during assessment that are preventing appropriate pain management; additionally, non-pharmacological pain interventions are found to be very effective in treating chronic non-cancerous pain. The objectives of the research are met and this article provides an overview of what is in the current literature for chronic non-cancerous pain management in the geriatric population.

Introduction

Pain is the body's indicator of a problem. It is a physiological response to an imbalance in the body's homeostasis. By definition, it is an unpleasant sensory and emotional experience associated with actual or potential tissue damage (Ignatavius, 2016). Pain is categorized as acute or chronic. Acute pain is often the result of sudden trauma to the body, whereas chronic pain is caused by an ongoing injury to tissues or nerves. Acute pain is defined as pain experienced for a short period of time, while chronic pain is defined as pain experienced for a period of time longer than three months and can further be categorized as chronic cancerous pain or non-cancerous pain.

Pain is perceived in the body through a process called nociception. In this process, nociceptors, which are specific neurons in the body, activate in response to noxious stimuli in various parts of the body and transmit a signal to the central nervous system (CNS) via axons. These axons come in two types: myelinated (A-delta fibers) or unmyelinated (C fibers). With myelinated axons, there is a sheathed coating that allows the axon to transmit signals at a much quicker speed; thus, A-delta fibers transmit a pain that is perceived to be sharp whereas C fibers transmit signals that are perceived as dull and/or aching. Additionally, pain can also be felt as a result of tissue injury, known as neuropathic pain, which is experienced from the abnormal processing of painful stimuli by the neurons (Ignatavius, 2016).

Each individual will express pain in their own way. Although pain is mainly a subjective symptom, there are limited physiological methods of measuring pain. Patients will have decreased oxygen saturations while in extreme pain; additionally, the heart rate, respiratory rate and blood pressure will rise with the experience of pain (Ignatavius, 2016). Although these symptoms can give a provider some insight into a patient's physiological response to pain, the

most accurate method of measurement for pain level and intensity is the subjective report given by the patient. This is because each person has an individualized pain threshold and what may be minimal pain to one individual may be extreme pain to another individual. Because of this, pain management must be assessed on an individual basis and cannot be denied at the provider's discretion. It should also be noted that these types of physiological responses to pain are felt only in the case of acute pain. As the body acclimates to the presence of pain, these physiological markers are no longer triggered (Ignatavius, 2016).

Geriatric Population

The geriatric population differs from the average adult in a multitude of ways. Because of their increased age, they are at risk for having multiple comorbidities in addition to the chronic pain. This can include having cardiac conditions, hepatic and renal conditions, and cognitive impairments (Ignatavius, 2016). In addition to this, the geriatric population may not be able to tolerate the gastrointestinal effects of non-steroidal anti-inflammatory medications (NSAIDs) as well because of the changes over time that occur to their stomachs, livers and kidneys. The geriatric population is also at risk of suffering from complications of polypharmacy. Polypharmacy is using more than one pharmacological substance at the same time. These patients are generally on multiple different types of medications, and when combined with NSAIDs or opioid medications, it may have a synergistic effect on their bodies, such as increased risk of confusion, dizziness, drowsiness, urinary retention, or hypotension (Ignatavius, 2016). Each of these adverse effects places a geriatric patient at increased risk for harm and complications that could result in serious injury. Because of this, careful consideration is necessary when assessing the pain of a geriatric patient and creating a pain management regimen to treat the pain.

Underlying Mechanisms of Pain Perception

Pain is perceived in two different mechanisms. The first mechanism of pain perception is nociception, which can be described in a four-step process. Nociception refers specifically to how the physiological systems of the body function to perceive noxious stimuli as conscious pain (Ignatavius, 2016). In the first step of this process, called transduction, neurons known as nociceptors are stimulated and release “excitatory compounds” such as serotonin, bradykinin, histamine, substance P, and prostaglandins. The second step is called transmission. In this process, an action potential is generated from the periphery axons towards the CNS. These periphery axons come in either A-delta fibers or C fibers. The difference between these two types of axons is that A-delta fibers are myelinated and faster in conduction while C fibers are unmyelinated. Because of this, A-delta fibers are excellent at detecting thermal and mechanical types of injuries whereas C fibers detect mechanical, thermal and chemical stimuli. The third process is perception, which activates brain structures such as the cortex to initiate awareness and emotions/drives associated with pain. The final process is modulation, where there is afferent input generated from the noxious stimuli (Ignatavius, 2016).

The second form of pain is neuropathic pain, which occurs from damage to the PNS or CNS. This refers to abnormal processing of stimuli, causing patients to experience pain that can be described as “burning, shooting, stabbing, or feeling of pins and needles” (Ignatavius, 2016).

Current Nursing Assessment Tools

Currently, the golden standard of assessing pain is based on patient report. Because it is a perception that is highly subjective, the best indicator for pain is the patient’s own report of their pain level. It is the responsibility of the nurse to complete a thorough assessment of pain to have

a clear and concise idea of what is going on. This includes asking for the location of the pain, the intensity of the pain, alleviating and aggravating factors, quality of pain, the onset and duration of pain, whether or not it radiates, and the effect it has on the patient's activities of daily living.

In addition to this, there are also standardized assessment tools used to help patients express their level of pain. This includes the following:

- Numeric Rating Scale (NRS)
- Wong-Baker FACES Pain Rating Scale
- Faces Pain Scale-Revised (FPS-R)
- Verbal Descriptor Scale (VDS)

The NRS is a tool with a numerical range from 0-10 in one digit increments with 0 being no pain and 10 being the worst pain ever experienced. This tool is best utilized in patients who are cognitively sound and are capable of speech. The Wong-Baker FACES Pain Rating Scale is a scale with cartoon faces and descriptive words ranging from no pain (smiling face) to worst pain (crying face). This scale has six different cartoon faces and is best utilized with patients who are younger and may not be able to appropriately use the NRS. Similarly, it is best utilized with patients who are not capable of speech, as they can point to the face. This tool is very similar to the FPS-R in concept; however, the FPS-R has seven different cartoon faces representing a range of pain respectively. Finally, the VDS assessment tool utilizes a range of phrases to describe pain intensity. For example, no pain, mild pain, severe pain, etc.

Pharmacological Agents

Pharmacological interventions are the first type of intervention often thought of to treat pain.

This type of intervention includes oral medications, injections, intravenous medications, and transdermal medications such as patches. There are three categories of pharmacological interventions for pain management: non-opioid analgesics, opioid analgesics and adjuvants. When treating chronic pain, the first choice of treatment is non-opioid analgesics. If this alone is not successful, providers move forward and incorporate opioid agents and/or adjuvants as needed.

Non-opioid analgesics. There are three main categories of non-opioid analgesics used: salicylates, non-steroidal anti-inflammatory drugs (NSAIDs), and para-aminophenol derivatives (Aschenbrenner & Venable, 2012). Salicylates and NSAIDs work by inhibiting cyclooxygenase (COX) and by decreasing prostaglandins and thromboxane A. These are substances that regulate inflammation, body temperature, pain transmission and platelet aggregation in the body. Furthermore, COX enzyme is found as COX-1 enzyme and COX-2 enzyme in the body. The COX-1 enzyme is used for normal cellular functions while the COX-2 enzyme produces prostaglandins in areas of inflammation. By decreasing these enzymes, medications are able to reduce inflammation and swelling and also decrease the body's perception of pain peripherally (Aschenbrenner & Venable, 2012). The first category of these medications is salicylates. The most commonly utilized salicylate is aspirin. Aspirin is an antipyretic, anti-inflammatory agent and an analgesic. It works in the body by decreasing prostaglandin production and irreversibly inhibiting thromboxane A to reduce platelet aggregation. Similar to aspirin, non-steroidal anti-inflammatory agents such as ibuprofen and naproxen work in the same way. The difference with these agents is that they have a reversible effect on the body. Finally, para-aminophenol derivatives such as acetaminophen work on the body as antipyretics and analgesics. Acetaminophen works centrally by inhibiting prostaglandin synthesis in the CNS but also works peripherally in COX inhibition (Aschenbrenner & Venable, 2012).

Opioid analgesics. Opioid analgesics are pain medications that are either natural or synthetic derivatives of opium. These medications work in the central nervous system on opiate receptor sites and inhibit the perception of pain. Opioid analgesics vary in strength and potency; morphine is the prototype medication used to reference strong opioids and codeine is the prototype used to reference mild opioids. Because of the centralizing effects of these medications, they are highly effective at pain control; however, the patient has the possibility of building up a tolerance to these medications from prolonged use. In addition to this, they also pose a great risk of being habit-forming. Finally, because of the way the medication reacts in the body, these types of pain medications can cause drowsiness, dizziness, and respiratory depression. Because of this, these medications are generally controlled substance legend drugs, which can only be obtained by a prescription from a physician under very specific regulations from the United States Drug Enforcement Agency (DEA) (Aschenbrenner & Venable, 2012).

Adjuvants. Adjuvant medications are medications that are typically not used for pain. These are medications that may also be used alone or in combination with other medications to treat pain as an off-label use and can include anti-seizure medications, antidepressant medications, muscle relaxants, sedatives, and anti-anxiety medications. With these types of medications, the patient may experience similar side effects as listed above such as dizziness, drowsiness or respiratory depression. Because of this, it is important to understand what other medications the patient may be on or to take into consideration the synergic effect that these adjuvant medications may have in addition to other medications the patient may be on. Also, it is imperative that the patient not combine alcohol use with these types of medications, as it can compound upon the side effects and cause greater levels of dizziness, drowsiness or respiratory depression (Aschenbrenner & Venable, 2012). It is important to note that this poses as a serious safety issue for the geriatric

population. The synergistic effect of these medications in combination with medications for other comorbidities, such as high blood pressure, can consequently lead to falls, altered mental status and confusion.

A Review of 2007-2016 Literature

Review Methodology

English language articles from 2007 until 2016 were searched using the CINAHL database. Search terms to find the articles included a major heading of chronic pain, with limiters including articles with abstracts available, written in the English language, peer reviewed, evidenced-based practice articles, research articles, with patient populations 65+. After applying the limitations and exclusion criteria, seventeen articles were used as the final set of articles. During my review, I looked for what the current data showed on pain assessment tools and their efficacy, what types of pharmacological interventions were being implemented and whether alternative forms of interventions were proving to be beneficial for the geriatric population. Based on this, I categorized the final set of articles into three key areas of focus: patient experience, pharmacology, alternative therapy. The study did not collect any primary data, nor did I as the author collect any data directly from human subjects.

Review Results

Initially, 14,326 articles were retrieved for review. After applying the exclusion criteria, 40 articles were found. Of these 40 articles, 17 were relevant for the areas of focus of this study, thus attaining the final set of articles for a full review. The other 23 articles either did not fit the focus of the study or were unavailable. Each article was reviewed systemically for content relevance and efficacy towards areas of focus.

Population affected. The patient population affected included geriatric patients, both male and female, of the ages of 65 and above. The articles were based on populations within: the United States (9), United Kingdom (1), France (1), Hong Kong (1), Italy (1), other (4). The other category includes the remaining articles that did not have a specific location of focus and was a systematic review of literature available at large. No particular geriatric population appeared to be more at risk for chronic pain in comparison to the others; however, it is noted that the geriatric population does suffer from intrinsic as well as extrinsic barriers to reporting pain appropriately (Gammons & Caswell, 2014). Upon review of the articles, there is also no singular cause of pain identified. The most recurring form of chronic pain mentioned is that of unspecified chronic lower back pain.

Current pain assessment tools and patient experience. As stated above, there are many different scales and tools utilized to measure the extent of pain experienced by a patient. However, the literature reveals that the efficacy of pain management is not effective. As stated by Ryan, Schofield, and Clarke (2006), the geriatric population suffer from decreased abilities to carry out daily activities and have decreased quality of life due to the experiences of chronic pain. For example, this qualitative study uncovers that as a consequence of experiencing chronic pain, patients may suffer from sleep problems, mood depression, and isolation. These patients were unable to appropriately voice their concerns due to preexisting stereotypes and connotations related to pain experienced by the geriatric population. “Participants described being unable to express their pain sufficiently in words and suggested that stereotypes which view 'the elderly' as talking constantly about pain and illness made it even harder for them to express their feelings about it” (Ryan et al., 2006). Patients feel that they cannot talk about their pain because of preexisting stereotypes of the geriatric population having constant pain. Society has created the idea that pain in the geriatric population is “normal” and is a characteristic of their life; however,

this assumption has created an environment that undermines the ability to be openly expressive about chronic pain and a great obstacle for a geriatric patient to overcome because the pain they are living with is affecting their quality of life and decreasing their livelihood. Patients also feel that they cannot talk about their pain and subsequent inability to take care of themselves for fear of losing independence or having to live in an assisted living facility. Furthermore, the geriatric patient is seen as an individual who may have gotten “used” to living with pain and can become a victim of this ideology from being treated with “inconsistent and arbitrary pain management strategies” (Ryan et al., 2006). In another study by Gammons and Caswell (2014), similar considerations are analyzed where there is a specific focus on barriers effecting communication between healthcare workers and patients. The focus is on various attitudes, both on the patient’s behalf and healthcare workers’ behalf, that disrupt appropriate pain management and care. Results on behalf of the patients determined that there was a barrier in reporting pain due to fear of losing independence or making pain a major priority in life. The geriatric patient is under the assumption that if they admit to the presence and severity of their pain and the impact it is having on their activities of daily living, they will lose the ability to be independent and assume their own care. In addition to this, the geriatric patient is assuming that by communicating about their pain thoroughly with a healthcare provider, the pain and subsequent treatment will become a major focus point in their life. On behalf of the healthcare worker, lack of proper interprofessional communication and beliefs of drug seeking behaviors by the provider lead to incomplete pain management care (Gammons & Caswell, 2014).

In another article focused on the diagnosis and assessment of chronic lower back pain, it was discovered that a majority of primary care physicians did not feel “very confident” in their own ability to do this (Cayea, Perera, & Weiner, 2006). The primary care physician is generally

the first person a patient sees when they are having a problem or experiencing pain or discomfort. Currently, six million geriatric patients suffer from lower back pain which can cause many different problems once progressed to a chronic stage (Cayea, Perera, & Weiner, 2006). Because of this, it is imperative that primary care providers utilize knowledge and experience to diagnose the source of pain and initiate a treatment plan. However, the results of this study show that there is a need for further education of primary care physicians for treating elderly patients with chronic lower back pain.

The percentage of PCPs who felt very confident in diagnosing the individual contributors of CLBP was less than 50% for all items... For education to positively affect patient outcomes, gaps in the current state of knowledge about the treatment of older adults with CLBP need to be filled (Cayea, Perera, & Weiner, 2006).

It is imperative to bridge the knowledge gaps and gain further understanding of the patient's experiences towards pain and their pain management regiment. Poorly controlled pain can manifest many other complications, including physical, psychological and cognitive declines. This type of situation is conducive to further medical comorbidities (Bertin et. al., 2013).

Pharmacological interventions. The two main areas of focus among the articles in regards to pharmacological interventions are the use of NSAIDs for pain management and whether it is appropriate to give opioid medications to the elderly for chronic pain. Two of the five articles focus on the use of NSAIDs in chronic pain management. Although NSAIDs are the first choice for pain management, they are associated with many adverse effects in the elderly population. NSAIDs can cause peptic ulcers, bleeding, perforation, increased risk for myocardial infarction, peripheral edema, elevated blood pressure, GI bleeding, thrombotic events, renal

adverse effects, as well as hepatic adverse effects (Barkin et. al., 2010). Because of increased age and natural declines due to aging, as discussed above, geriatric patients are much more highly susceptible to these adversities. This is further supported by evidence presented by Bertin et. al., (2013) as they state that “The prescription of the major drug classes followed national and international guidelines rather closely...analgesics were the most widely prescribed- mainly paracetamol- and NSAIDs were the least used as they present risks in elderly patient.” In this case, the risks that are being referred to include the hepatic and renal complications as well as the gastrointestinal complications associated with NSAID use. NSAIDs do present with advantages as well when compared to other pharmacological interventions. One specific benefit is the ability to utilize these agents without the risk of addiction or habituation, which is a common problem when faced with using opioid analgesics. Additionally, NSAIDs are available in medication formulations that are topical and present substantially reduced systemic adverse effects. By being a topical medication, they are able to skip the systemic concerns related to renal function, hepatic function and cardiovascular function (Barkin et. al., 2010). This is because they are applied locally to the area(s) affected and are not absorbed directly into the bloodstream. If the benefits outweigh the risks and the individual is at low risk for experiencing adverse effects, it is recommended that they use NSAIDs as prescribed, based on the findings of the articles.

The use of opioids has also been found to be effective and acceptable for pain management after trying and failing management with NSAIDs or non-opioid agents alone. Papaleontiou et al., (2010), showed that utilizing opioid agents for a short amount of time did have positive effects on pain relief. However, it is noted that there is an inconsistency in treatment between recommended guidelines and current practice. “Establishing the benefits of

long- versus short-acting opioid agents in older populations is needed, given that guidelines continue to recommend use of long-acting formulations, whereas clinicians continue to prescribe mostly short-acting agents for chronic pain in their older patients” (Papaleontiou et al., 2010). The concern with using pain medications for a longer duration may be that providers believe patients will develop a dependence on opioid agents. Habit-forming tendencies, dependence and addiction are all potential side effects of using narcotic substances, because of their higher potency and effects on the central nervous system. However, the study goes on to state that further research is needed in this area to determine the probability of developing a dependence in the geriatric population (Papaleontiou et al., 2010). The idea of potentially developing addiction is further supported by Pergolizzi (2012) who writes:

Although not discussed, the potential for abuse as well as accidental misuse of opioids (and the associated risk for serious adverse events) are key considerations when prescribing long-acting formulations...several long-acting oral opioids are now formulated with crush-resistant matrices intended to present obstacles to abuse but with the added potential to serve as a barrier to the types of misuse noted above.

Pergolizzi (2012) also makes a point to discuss the concerns on safety and cognition that opioid analgesics can present to the geriatric population. As stated above, the direct effects on the central nervous system create a major problem for geriatric patients because they then become much more susceptible to safety hazards and falls. Not only this, but because opioids affect the central nervous system so directly, they create greater effects of drowsiness, dizziness, hypotension, altered level of consciousness, respiratory depression and urinary retention, which can all lead to severe complications when left unnoticed.

Alternative forms of therapy. Alternative forms of therapy can consist of many different non-pharmacological interventions. Upon reviewing the data, there was research found on various exercise and therapeutic interventions including acupuncture, physical exercise, Pilates, spinal manipulation and still point induction as forms of therapy. In the article by Xu et. al., (2013), the use of acupuncture on chronic lower back pain was analyzed. Acupuncture, which is a traditional form of ancient Chinese therapy, is considered to work by bringing to balance the Yin and Yang forces in the body. This is achieved by inserting needles into specific points within the “meridian lines” of the body. The researchers compared traditional acupuncture to “sham acupuncture”, which was a form of false acupuncture where the needles are inserted outside of the traditional lines and points of healing. “When acupuncture has been compared with no additional treatment or blank treatments, the results have consistently shown that acupuncture is significantly more effective...” (Xu, et. al., 2013). However, the article subsequently stated there was no greater difference in the efficacy of acupuncture versus the sham acupuncture. Because of this, the researchers question whether the healing properties of acupuncture are derived from specific healing points in the body or from skin manipulation at the surface level. In another article, acupuncture is again analyzed as a healing tool for chronic shoulder pain. In this study, the researchers also analyze acupuncture versus “sham acupuncture”; however, in this article the “sham acupuncture” is described as needles that do not penetrate the skin. The researchers used blunted needles which gave the sensation of pricking the skin; however, in actuality there was no penetration of the skin or any other form of skin manipulation. What is interesting is that in this article the use of acupuncture over the course of six weeks, in combination with a home exercise program, is shown to greatly improve shoulder pain and usage in comparison to the “sham acupuncture” or to no treatment at all (Lathia, Jung,

Chen, 2009). These two articles do introduce an interesting question of whether the efficacy of acupuncture is simply derived from skin manipulation rather than specific healing points.

In another article, the effectiveness of regular physical exercise was analyzed and found to be very beneficial in pain management. Tse, Tang, Wan and Vong (2014) analyzed the efficacy of a regimented physical exercise program once a week in the nursing home population and found the benefits of such interventions to have positive results on chronic pain including neck, back, hip, shoulder, knee, ankle and multi-joint pain. In this study, these geriatric patients were attending a physical exercise program regularly on a weekly basis for an extended period of time. By making the physical exercise component a regular and consistent part of their life instead of a random, sporadic action, they were able to benefit from this by decreasing pain levels. This view is further supported by Patti et. al. (2015) who focuses on the use of Pilates as a form of pain management intervention. “Pilates method-based exercises are more effective than no treatment or minimal physical exercise interventions in the management of chronic nonspecific LBP” (Patti et. al., 2015). In this article, the initiation of Pilates as an intervention is supported through research to have positive outcomes.

In another article by Merepeza (2014), the use of spinal manipulation is analyzed. The researcher looks at three different studies, which result in different evidence. Thus, the use of spinal manipulation as being an effect treatment of chronic lower back pain is inconclusive and must be further analyzed by future research. In a final article by Townsend, Bonham, Chase, Dunscomb and McAlister (2014), still point induction is analyzed in efficacy with massage therapy. Still point induction, also known as self-induced cranial still point therapy, is a form of therapy where a soft ball such as a tennis ball is used to apply pressure to the occiput while laying supine. According to the data, this type of intervention as well as massage therapy both

have significantly positive effects of patients' pain and comfort when used separately and/or in combination with each other (Townsend et. al., 2014). These various findings support that there is much research currently being conducted in therapeutic forms of pain management outside of the pharmacological realm. The most positive aspect of utilizing non-pharmacological interventions is the lack of adverse effects experienced by the client and the decreased risk of systemic complications, addiction and other negative outcomes associated with medications and pharmacological therapy.

Findings

These tiers analyze three specific aspects of chronic non-cancerous pain in the elderly population. The research addresses the patients' pain management experiences, their pharmacological plans for pain management, and the current trends in alternative therapy. With current patient experience of pain, the articles showed that there were many assumptions in the minds of the patient and the healthcare workers that were facilitating inappropriate pain management. The research shows that geriatric patients are living with the assumption that openly communicating about their pain will decrease their level of independence and will, in turn, make the pain a focal point in their life. Unfortunately, by operating under these assumptions, the level of openness and honesty in communication is greatly affected between the patient and healthcare provider. Without proper communication, it then becomes very difficult to understand the nature, severity and extent of pain and altered abilities of performing activities of daily living. The research also shows that healthcare providers are operating with their own assumptions and communication barriers in place. This is because providers are often under the assumption that a patient may be seeking pain medications when they communicate openly about severe chronic pain; furthermore, miscommunication between various members of the healthcare

team also demote the ability to appropriately manage pain for the patient. Essentially, these findings highlight the necessity to practice good communication skills among healthcare workers and voice the need for honest and appropriate communication to the patient throughout the treatment process.

The literature review also addressed the concern that primary care providers do not feel confident in their ability to appropriately diagnose chronic lower back pain when presented in the clinical setting. This evidence demonstrates a need for introducing stronger educational content and refresher courses to allow both new and experienced physicians and providers the ability to continuously improve their assessment and diagnosis of these types of ailments. In doing so, this quickens the process of identifying and treating pain as necessary to reduce preventable complications. These articles do not, however, encompass all aspects of these three tiers. Within the realm of patient experience, I had anticipated learning in further detail about specific pain assessment tools and techniques to pinpoint pain in the elderly population. This was very briefly mentioned in one article; however, I believe this is an area that must be explored in further detail with the above findings.

In addition to this, the regimen for pain management medications can also be further explored. The findings above indicate the usefulness or lack thereof of a particular class of medication including NSAIDs and opioid analgesics. The data does not, however, address the use of combination regimens and use of adjuvant medications in the pain management regimen. This includes the effects of NSAIDs with opioids and medications such as anti-depressants, muscle relaxers and other adjuvant agents. The synergistic effects of multiple medications are a primary part of pharmacological intervention and this data is limited in reflecting this. Additionally, further research in the synergistic effects of these various types of medications can

help to further facilitate understanding of pharmacological interventions in chronic non-cancerous pain. For example, in addition to an NSAID, a patient may be prescribed a short acting opioid analgesic as well as a long-acting opioid analgesic. These various combinations change the pain management schedule and allow for greater control of pain. It is important to note that the research does show long-acting opioid medications to have a better outcome with pain management. These formulations of opioids are, however, being less prescribed due to a provider concern of increasing potential for addiction. Future research will benefit greatly from analyzing the use and efficacy of long-acting formulations of opioid analgesics and the research behind addiction and habituation in the geriatric population. Not only this, but pharmacological agents are not limited to oral medications. There are nerve blocks, injections, and other non-oral medications such as patches that are prescribed and administered to patients to facilitate appropriate pain management. The above data does not highlight these properties and future studies will benefit by taking this into account to have a more fully encompassing analysis of pharmacological agents.

Current alternative therapy is focused on physical therapy, acupuncture, and other mobility activities. There were two articles that focused on the use of acupuncture in pain management. Although both articles showed positive evidence that acupuncture does greatly improve pain, they present the question of whether acupuncture is effective because of skin manipulation or because of specific “acupoints” in the body. In future studies and reviews, this could be a topic to explore more extensively. It would also be beneficial in future research to utilize acupuncture therapists who are all trained and certified from the same accrediting body. By doing this, it would remove any areas of variability and may help to shed light on the true nature of the efficacy of acupuncture. The findings do also address physical activity and Pilates as being

beneficial in managing pain. However, having a greater body of supporting data will help to further prove this finding. In future research, it can be analyzed if there is an optimal frequency of weekly exercise that leads to the greatest amount of pain relief and whether there is a specific type of exercise that leads to the greatest form of relief. For example, does exercising 2-3 times weekly have a better outcome than just once a week? Does yoga and other various types of sports have the same type of results? One final area explored in the research was still point induction versus massage therapy. The research proves that both types of interventions positively affect pain relief. What is even better is that still point induction can be taught to an individual to them self-administer this type of therapy on oneself. In the case of massage therapy, there is a need for another individual to be present who is trained to administer massage therapy.

Also, these findings do not explore transcutaneous electrical nerve stimulation (TENS) and other non-traditional forms of therapy for pain management. In addition to this, the primary focus of the studies is on chronic lower back pain. While this is a very common type of chronic non-cancerous pain, a broader analysis of various pathological abnormalities would provide a fuller spectrum and would show whether these types of interventions are beneficial in managing more than one type of pain. Furthermore, the articles were a broad analysis of different healthcare disciplines. It did not encompass specific nursing interventions such as the use of heat, ice, guided imagery, aromatherapy, or distraction. Future research can explore each of these areas separately or in combination to one another to see whether they had a greater effect on pain management versus pharmaceutical agents or whether they provide as much relief as physical therapy and other alternative forms of pain management. Including these types of interventions in future research may help to provide a better understanding of non-

pharmacological interventions in more than one discipline of healthcare and provide evidence for more holistic approaches to pain management regimens.

A limitation of this literature review is that the articles are dated between 2007-2016. Because the articles encompass data within the past ten years, some research may be outdated or not as up to date as current literature. Further analysis of most recent data may show newer or updated findings in the areas that were lacking as listed above. Another limitation would include the seventeen articles compiled for review. Only the CINAHL database was utilized in researching articles. Expanding the search to utilize other databases such as PubMed or MEDLINE may yield a more substantial literature compilation. Additionally, perhaps having a greater selection of literature that fit the inclusion criteria would yield more quantifiable results. One final limitation would be that the articles selected all fell within numerous healthcare disciplines. This literature review did not focus on one specific healthcare discipline; rather, it focused on collaborative efforts between healthcare professionals and providers to address the issue of chronic non-cancerous pain. This may be seen as a limitation because all the results of this literature review may not be applicable to any one area of healthcare.

Conclusion

Chronic non-cancerous pain is a dilemma affecting many individuals in our society. It is a concern particularly in our geriatric population, as the lifespan is increasing to allow them to experience an older age that our predecessors were unable to experience. Consequently, the experience of chronic pain is responsible for reducing an individual's quality of life, contributing to illnesses such as depression and anxiety, and facilitating poor social relationships as a consequence of this disease state. Not only this, it plagues an individual with decreased abilities to manage their day to day activities and life to their fullest. When reviewing the literature

articles above, the intention was to discover what chronic non-cancerous pain was in today's geriatric patient. This included how it was assessed, how patient's felt about their pain and pain management, the current pharmacological treatment options available to patients, and the current non-pharmacological treatments used as alternative forms of therapy to treat pain. In pursuing this research, I was unsure of what types of answers I would find and what categories the literature body would fall into; however, upon reviewing the final set of articles I am able to say that each question I set out to find an answer to was addressed. I have found the literature to address all of these areas, some areas had more brief information while others had more substantial evidence, and am excited to see what the future holds for this area of medicine. Pain management is an evolving specialty with many healthcare providers able to specialize in this topic. For the nursing profession, this area is especially important because it impacts not only the physical aspect of a patient, but it also impacts their psychological and spiritual wellbeing. Being able to manage pain effectively and efficiently not only brings a sense of comfort to the patient, but it greatly improves their overall quality of life and health long term. This literature review contributes to current knowledge by analyzing what some of the research shows within the past ten years and addresses some gaps in research and knowledge that will be beneficial to address in future research.

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