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# Appraisal of Nonpharmacological Chronic Pain Management

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# Walden University

College of Health Sciences

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Yvonne Anthony

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2017

Abstract

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Project Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Nursing Practice

Walden University

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## Abstract

Chronic pain is a condition that impacts millions of men and women around the globe. It is a compelling disease that particularly impacts quality of life (QOL) for many veterans with undertreated or untreated pain. The focus of this systematic literature review was the appraisal of articles and clinical practice guidelines to better understand best-practice nonpharmacological strategies for management of chronic pain. Key words used in the literature search included chronic pain and veterans, complementary alternative medicine (yoga, tai chi, music therapy, acupuncture, and massage), and cognitive behavioral therapy (CBT). The articles included in the review were limited to those pertaining to adults over the age of 18 with non-cancer musculoskeletal chronic pain. The review excluded articles pertaining to patients reporting headache, cancer-related pain, fibromyalgia, mental health problems, or gynecological pain. Polit and Beck's levels of evidence were used to appraise each article. The Stetler model was used as the change model for this project. Thirty-six articles met the criteria and were included. Nine clinical practice guidelines were appraised. Four articles were pilot studies, 3 met the criteria for Evidence Levels V-VII, 3 met the criteria for Levels III-IV, 8 were Level II, and 18 were systematic reviews of randomized controlled trials (Level I). The analysis of evidence supported the use of yoga, CBT, acupuncture, and massage therapy as best-practice methods of personalized nonpharmacological pain management. This project is important for those who care for veterans and other adult chronic pain patients. Application of the findings may lead to changes in chronic pain management that will enhance social change and improve QOL for veterans and others living with untreated or undertreated chronic pain.

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## Dedication

This project is dedicated to my loving husband, Dennis Harrell, who has been patient and understanding throughout this journey. Also to my late sister, Linoria Anthony, Esq., who was a strong advocate for education and encouraged me toward life-long learning.

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## Section 1: Nature of Project

### **Introduction**

Chronic pain is a serious problem in the community as well as a public health challenge (Institute of Medicine [IOM], 2011). The aim of this project was to perform a systematic review of articles and clinical practice guidelines (CPGs) to provide patients with nonpharmacological alternatives for pain management. One of these alternatives is complementary alternative medicine, which patients can use to decrease the need for opiates. A systematic review is a rigorous process of examining the literature to identify, appraise, and synthesize studies to answer a clinical question (Melnyk & Overholt, 2011). The process included a comprehensive appraisal of the literature to ascertain relevant studies and the clinical practice guidelines that lead to a decrease in the use of opiates.

In particular, this project examined specific complementary medicine practices that can be used by persons suffering with musculoskeletal pain through a comprehensive, systematic review of the literature of specific complementary alternative medicine practices to be used by patients with chronic musculoskeletal pain. Section 1 of this project outlines the background of this project, as well as the problem statement, purpose statement, project objectives, and project questions. I also address the framework of the project, the significance of the project, the implications for social change, definitions of key terms, and assumptions and limitations.

### **Background**

Approximately 25 to 50 million Americans endure chronic pain (Denneson, Corson, & Dobscha, 2011). Veterans as a group suffer from chronic pain at rates

surpassing that of the general population. For example, it is estimated that approximately 50% to 75% of veterans have used Veteran Hospitals for the medical care of chronic pain (Denneson et al., 2011). Research has suggested that chronic pain persisted on average for 2-5 years following Gulf War and Iraqi War service (Groessler, Weingart, Aschbacher, Pada, & Baxi, 2008). Given that there is a direct correlation between pain and quality of life (QOL), many veterans are returning from service dealing with not only chronic pain, but also a challenging QOL that did not exist before deployment. As a result, chronic pain is identified as the number one disability among veterans using Veterans Administration (VA) services for their healthcare (Rosenberger, Philips, Lee, & Kerns, 2011).

Traditional pain management often includes the use of opioids. However, multiple negative side effects are connected with the use of opioids, such as loss of sleep, somnolence, memory deficits, nausea, fatigue, decreased appetite and/or weight gain, sexual dysfunction, and drug–drug interaction (Sehgal, Colson, & Smith, 2013). It is evident that these symptoms can severely affect those suffering from chronic pain. It should be noted that constipation is the one side effect that does not resolve over time.

Moreover, the consumption of opioids in persons with diagnoses of chronic pain has not been successful, as many patients are dissatisfied with their treatment plans that include the use of opioids (Sehgal et al., 2013). According to Sehgal et al. (2013), individuals on opiates experience an increase in respiratory depression and opiate-related death. It is alarming to note that deaths from opioids outnumber deaths from car accidents in the United States (Schoemaker & Buckenmaier, 2014). Additionally, sudden deaths

and opioid-induced cardiac toxicity, opioid misuse, abuse, and harmful use of opiates contribute to increased mortality. Because of the increase in mortality and morbidity, it is evident that changes in current prescribing practices must occur.

The literature is limited in recognizing any benefit in using opiates over an extended period. However, the use of opiates during periods of exacerbation may be efficient (Bohnert et al., 2011). These changes in prescription practices of routinely prescribing opiates for pain over an extended period of time have led to an increase in mortality and morbidity. In 2008, opiates contributed to 73.8% of all prescription drug overdoses (Sehgal et al., 2013). For this reason, it is necessary to make changes that decrease morbidity, mortality, and related incidences.

Given the current state of opioid use, there is a need to identify other methods to manage pain among the veteran population that include nonpharmacological approaches, health promotion, psychological support, and coordination of care (TJC, 2012). For example, researchers recommend that veterans be educated on the 1-10 Defense and Veteran Pain Rating Scale (DVPRS; see Appendix A) to safely identify and treat their levels of pain (The Joint Commission [TJC], 2012). The use of the DVPRS facilitates self-reporting of pain levels by patients and improves communication between patients and health care providers. The DVPRS provides the clarity that is needed when a veteran is describing his or her pain.

Although the DVPRS is one plausible means of improving pain management treatment, treatment options that include nonpharmacological interventions are limited. It is of paramount importance to recognize that nonpharmacological methods elevate QOL

for veterans, given the risks that opioid use present. Carefully choosing the best nonpharmacological treatment modality is important in the effort to ameliorate veterans' QOL. Thus, the intention of this project was to conduct a comprehensive, systematic literature review to determine the impact of nonpharmacological methods in terms of improved QOL and decreased pain for all of those experiencing chronic pain. What is the level of quality of the nonpharmacological chronic pain treatment methods available, based on chronic practice guidelines and articles? Using the Critical Appraisal Checklist allowed me to assess the quality of articles and make recommendations regarding the implementation of the nonpharmacological chronic pain CPGs in practice.

### **Problem Statement**

Chronic pain is common and affects more than approximately 50% of those in VHA facilities. Chronic pain is also costly, and it places a strain on the medical management of health care in the nation. For example, the treatment of chronic low back pain is estimated to cost 2.2 billion dollars annually (Rosenberger et al., 2011). Chronic pain contributes to lost school days, workdays, productivity, and income (IOM, 2011). Moreover, chronic pain can lead to decreased QOL related to loss of sleep, somnolence, memory deficits, nausea, fatigue, sexual dysfunction, drug–drug interaction, decreased appetite, and/or weight gain (Seghal et al., 2013). Further, stigmatization or fear of stigmatization contributes to the reluctance of some veterans to seek treatment for chronic pain (Murdough, 2009).

### **Purpose Statement**

The aim of this evidence-based project was to systematically analyze chronic pain CPGs and current literature in order to make recommendations for practice.

### **Project Objectives**

The objectives for this project were as follows:

- Analyze CPGs and articles that focus on nonpharmacological chronic pain reduction;
- Establish the quality of nonpharmacological chronic pain CPGs and articles using the Rapid Clinical Appraisal checklist and an evaluation table (Melnyk & Overholt, 2011) and the Stetler model of evidence-based practice (Stetler, 2001).
- Make recommendations based on the quality of nonpharmacological chronic pain CPGs and articles for use in clinical practice.

### **Project Question**

What is the level of quality of the nonpharmacological chronic pain methods available from CPGs and articles?

### **Framework**

The Stetler model was the ideal model for this project because it addresses research use and evidence-based nursing practice (Stetler, 2001; see Appendix B). The Stetler model enhances Melnyk and Overholt's (2011) critical appraisal of the evidence. Moreover, the critical appraisal process is useful in this process because it provides specific checklists (see Appendix D) for appraising articles as well as CPGs. The critical

process for systematic reviews includes the following three questions: (a) What are the results of the appraisal? (b) Are the appraisal results valid? and (c) Did the results assist me in providing compassionate care for my patients? The process includes a narrative description of levels of evidence as well as inclusion, exclusion, and synthesis tables.

The Stetler model is a practitioner model that outlines the use of research findings to support practice decisions (Stetler, 2001). The model has five graphic phases and a descriptive table clarifying information for each phase. The phases in this project were as follows:

1. Identify the problem (chronic pain).
2. Validate the problem through a comprehensive, systematic review of literature. (The review of literature was rated for the level of evidence as well as its quality.)
3. Compare, evaluate, and synthesize the findings.
4. Determine the applicability of the findings to practice.
5. Evaluate the findings (Stetler, 2001).

The Stetler model is safe and effective for using research findings.

### **Significance of the Project**

The significance of the innovative practice that was the focus of this study involves the evolution of high-quality nonpharmacological chronic pain management strategies. The Melnyk and Overholt critical appraisal guide (2011; see Appendix D) and Stetler's model were used to appraise articles and CPGs to inform stakeholders, clinicians, and patients regarding quality nonpharmacological CPGs and articles used to

develop guidelines. Through the development of high-quality recommendations based on the results of Melnyk and Overholt's (2011) critical appraisal of CPGs and articles, I sought to inform stakeholders and patients of the availability of complementary alternative medicine strategies.

The Stetler model (2001; see Appendix B) is an evidence-based nursing practice model that was used in this systematic review for developing a high-quality process that is beneficial to practitioners and chronic pain patients. The model has five phases that elucidate the process of evidence-based nursing practice. Undiminished chronic pain is a major disease process that has adversely impacted the quality of veterans' lives. Addressing the issue of chronic pain among veterans is particularly significant due to its prevalence among this segment of the population. Mass media have depicted the impact that opiates have on patients' lives.

For Phase 1 of the Stetler model, I conducted an extensive review of the literature on chronic pain. Phase 2 involved validation through systematic review of articles and CPGs, with a focus on complementary alternative medicine, including yoga, massage, music, tai chi, acupuncture, cognitive behavioral therapy, and chronic pain management. The validation process included a table of evidence as detailed in Melnyk and Overholt (2011). Phase 3 consisted of comparison and decision making. For this process, I compared the findings using a synthesis table. During Phase 4, the findings revealed the level of evidence, as well as the quality and applicability to practice. Phase 5 included evaluation of the evidence and dissemination of the findings to the veteran population through certain media. I disseminated the findings on an interactive blog for veterans.

This enabled veterans with chronic pain to give feedback by verbalizing their experience with complementary alternative medicine.

The military is a close-knit group that shares a common bond through camaraderie. In the military culture, members are expected to be resilient and strong. The culture of camaraderie and resilience is demonstrated when an injured military member asks to return to the combat arena in support of other comrades. This culture has led to the undertreatment or inappropriate treatment of chronic pain (Murdough, 2009). Often, the invisible wounds that military members and veterans suffer are not recognized. These invisible wounds can include diagnoses such as posttraumatic stress disorder (PTSD) and traumatic brain injury.

Military personnel are sometimes reluctant to report their conditions because of the fear of stigmatization (Murdough, 2009), which is traditional and perpetuated by military leaders. Military leaders expect members to accomplish the mission. Currently, some have accepted and recognized these invisible wounds, as veterans seeking behavioral care increased from 800,000 in 2008 to 2 million in 2013 (Gibbons, Migliore, Convoy, & Greiner, 2014). Acceptance is important because it promotes community recognition of veterans' needs in relation to chronic pain nonpharmacological management strategies.

According to Walker, Clark, and Sanders (2010), Operation Enduring Freedom and Operation Iraqi Freedom military veterans returned from multiple deployments with pain that was resistant to current therapies. Such pain may persist for years and lead to a chronic disease process. Chronic pain is not considered a symptom but a rather a medical

condition. Acute pain in and of itself is often undertreated and leads to chronicity, which is costly (Dickinson et al., 2010).

### **Implications for Social Change in Practice**

According to Walden University (2013-2014), “social change is a deliberate process of creating and applying ideas, strategies, and actions to promote the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies” (para. 1). The use of the Melynck and Overholt Critical Appraisal Guide to review nonpharmacological evidence-based practice guidelines and articles regarding chronic pain is essential because it can inform clinical decisions based on validity, reliability, and applicability (Melynck & Overholt, 2011). Chronic pain is a debilitating disease that interferes with the QOL of those affected. The pervasive nature of this disease can compound conditions such as PTSD and depression.

Chronic pain interferes mentally and physically with a patient’s QOL and impedes the patient’s ability to carry out daily living activities. Many patients are prescribed opiates yet do not experience improvement in their QOL (Denneson et al., 2011; Walker et al., 2010). This inadequate treatment or undertreatment of pain has led to poor patient outcomes. Through this project, I sought to provide evidence-based knowledge and develop high-quality recommendations directed specifically at the veteran population. At the beginning of this project, limited information existed on the effects of chronic pain among veterans. There was also limited information on nonpharmacological pain management strategies. Thus, the findings of this project may serve to improve QOL for veterans and possibly others, thereby promoting positive social change.

The overall expected outcome of this project was the identification of quality nonpharmacological methods for use in the treatment of veterans. The project results will be disseminated to veterans through publications, blogs, and presentations to veterans' organizations. The project may thus lead to positive changes in the behaviors of veterans suffering from chronic pain. Recommendations concerning nonpharmacological approaches may provide veterans with strategies to manage their pain. The veteran population is unique and has specific needs. In addition, veterans in the VA system tend to differ from veterans not involved in this system. Patients in the VA system are more likely to be older, less educated, and unemployed, as well as to have lower incomes in comparison to the U.S. population in general (Groessler et al., 2008).

### **Definition of Terms**

*Pain:* The International Association for the Study of Pain (2014) defined *pain* as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described regarding such damage” (para. 4).

*Chronic pain:* Pain that exceeds 3 to 6 months in duration, is caused by an injury or disease that is exacerbated and influenced by pathogens and involves distance from the originating cause (Fishman, Rathmell, & Ballantyne, 2009). Fishman et al. (2009) further clarified chronic pain as “pain that extends beyond the expected period of healing” (p .14).

*Melnyk and Overholt critical appraisal methodology:* Designed to assess the quality of a study based on its value or worth to clinical practice. This methodology may

be used to determine whether a study is valid, reliable, and applicable to informing patient healthcare outcomes (Melnyk & Overholt, 2011).

### **Assumptions and Limitations**

The intention of this project was to analyze the quality of nonpharmacological chronic pain CPGs and articles using the Melnyk and Overholt critical appraisal process guide. Military veterans have been recognized as a subgroup with increased vulnerability to chronic pain (IOM, 2011). Additionally, little rigorous research exists on alternative complementary practices, and, further, a lack of standardization within pain studies exists (IOM, 2011). Moreover, no current studies indicate individual group vulnerability to chronic pain (IOM, 2011). A final limitation is that pain is often treated as a symptom, not a disease. It was assumed that the critical appraisal checklist provided a method of measuring the quality of the CPGs and articles. It was also assumed that I adhered to the recommendations in the Melnyk and Overholt (2011) textbook when using the Critical Appraisal Checklist where appropriate. One possible limitation was the limited number of articles and CPGs on nonpharmacological pain management that were available for review.

### **Summary**

Approximately 100-105 million adults are impaired by chronic pain. Chronic pain by definition is pain that exceeds 3 to 5 months in duration. Chronic pain is a debilitating disease that affects millions of people, and it is the number one disability reported by veterans (Denneson et al., 2011). Veterans may indicate reduced QOL, be resistant to current therapies, and not be satisfied with their treatment plans (Walker et

al., 2010). The current use of opioid therapy has led to poor QOL outcomes due to side effects such as poor sleep, memory problems, nausea, and vomiting. The Joint Commission has recommended the use of nonpharmacological approaches to managing pain. Section 2 includes the strategic approach, specific literature, the conceptual model, and the theoretical framework.

## Section 2: Review of Scholarly Evidence

### Strategic Approach

The purpose of this project was to analyze chronic pain CPGs and articles to determine the quality of each article or CPG. Following the evidence-based process, a review of the literature was performed spanning the period of August 2013–December 2014. The following databases were searched: Cochrane Database of Systemic Reviews, Evidence-Based Resources from Joanna Briggs, CINAHL Medline, Thoreau, Google Scholar, PsycINFO, and Up-to-Date (an evidence-based database). The search of these databases focused on finding systematic reviews, randomized controlled trials, peer-reviewed articles, and evidence-based articles on chronic pain. Medical hardcopy and evidence-based books were used, including evidence-based textbooks. The key words and phrases used in the exploration of the literature included *pain, chronic pain, chronic pain and veterans, veterans with chronic pain, complementary alternative medicine (yoga, tai chi, music therapy, acupuncture, and massage), and cognitive behavioral therapy*. The scope of the literature review focused on pain as a major public health dilemma and its impact on veterans, as well as evidence concerning complementary alternative medicine (CAM) and cognitive behavioral therapy (CBT).

The search for evidence revealed 22,316 studies on chronic pain from 2008-2014. A literature search using the key word *veteran* produced 362 articles on chronic pain. Additional searches produced 344 DARE systemic reviews and 145 Cochrane systemic reviews. The evidence-based articles used in this project demonstrated hierarchical levels of evidence concerning methods of peer review and meta-analysis, as described by Polit

and Beck (2008; see Appendix C). The articles reviewed, arranged by level of evidence, included Level Type I systematic reviews of randomized clinical trials (RCTs; 12 articles); Level Type II, single RCTs (three articles); Level Type III, correlational systematic study (two articles); Level Type IV, correlational study (one article); Level Type VI, qualitative research studies (three articles); and Level Type VII, opinions of those who are recognized as authorities and serve on expert committees (16 articles; Polit & Beck, 2008). No articles were found demonstrating Level Type V, systematic appraisal of descriptive qualitative research studies. In total, 38 articles were used for this literature review. This section addresses specific literature on chronic pain, the use of opioids, quality recommendations, complementary alternative medicine, and the project's conceptual model and theoretical framework.

### **Specific Literature**

#### **Chronic Pain**

Chronic pain is an international problem. Three million Americans experience severe, chronic, and disabling pain (DeCarvalho, 2007). Chronic pain interferes with the QOL of those individuals who are impacted by this debilitating illness (Allcock, Elkan, & Williams, 2009). Chronic pain has a significant effect on the QOL of military veterans. Military members are returning home with chronic pain, which may be resistant to current therapies (Walker et al., 2011). Chronic pain can cause significant disability, and Sehgal et al. (2013) suggested that chronic noncancer pain patients are not happy with their treatment regimens.

Chronic pain is pain that surpasses the period of healing or exceeds 3 to 6 months in duration (Larner, 2013; Walker et al., 2010). Epidemiologic studies have found that chronic pain is highly prevalent in the United States (Tunks, Crook, & Weir, 2008). DeCarvalho (2007) contended that chronic pain may be related to sexual assault or any traumatic event that is disabling. An estimated 75% of females and 50% of males report pain when seen in primary care (Rhodes, Groninger & Malchow, n.d.; Rosenberger et al., 2011).

DeCarvalho (2007) showed that many patients who suffer from chronic pain also experience depression, which is described as the most common psychiatric diagnosis (DeCarvalho, 2007). Chronic pain is one of the most disabling conditions that a veteran may experience (Alschuler & Otis, 2013). There are other medical authorities that identify chronic pain as a significant disease process.

Walker et al. (2010) and Gibson (2012) asserted that the integrated health model offers an alternative approach to meet the multiplicity of needs that veterans face when they return from service. The integrated health model is a multidisciplinary design that is involved in veterans' care. The use of evidence-based therapies to improve veterans' QOL is required to achieve the goals of Healthy People 2020.

Healthy People 2020 has four overarching goals. The fourth goal emphasizes being healthy and promoting healthy behaviors that improve QOL (Department of Health and Human Services [DHHS], 2014). The other three goals focus on health equality and disparity elimination, a life that is long-lasting without preventable disease and early death, and a healthy environment (DHHS, 2014).

Chronic pain is a serious issue in the community as well as a public health challenge (IOM, 2011). The IOM (2011) has offered several reasons why pain is a public health problem. Many physicians prescribe opiates because of fears that patients' pain is undertreated. Additionally, many physicians are not comfortable with pain management. This discomfort maybe related to lack of training in pain management in medical school.

Additionally, research has found a correlation between military service in combat zones and a myriad of medical complaints that include chronic pain. A longitudinal study was conducted within the VA to determine the effectiveness of integrated health services (Smeeding, Bradshaw, Kumpfer, Trevithick, & Stoddard, 2010). Smeeding et al. (2010) showed that integrative medicine is an effective method for advancing the QOL experienced by veterans who suffer from chronic pain.

The integrative therapies reviewed in the Smeeding et al. (2010) project included acupuncture, aquatic bodywork, stress management, education, and counseling. Additionally, meditation, qi gong, tobacco cessation,,and weight control were included in the longitudinal outcome. The results of the longitudinal study supported the use of innovative options that are low cost and present little risk. Evidence suggested that there is a reduction in pain and improvement in QOL for veterans.

Moreover, Ligen et al. (2013) contended that 95% of patients experiencing psychogenic pain also have another pain diagnosis. Patients seek validation of their pain and pain management, along with acknowledgment of their pain (Allcock et al., 2007). Chronic pain is a disabling condition commonly seen in the military and among veterans and is pervasive among military cultures (Jacobson, 2011). Morasco et al. (2013)

described styles of coping with pain as maladaptive or adaptive. These maladaptive behaviors are related to resting and avoiding activity and are linked to pain interference and depression in veterans (Morasco et al., 2013). The treatment of pain is a priority in the Veterans Health Administration.

### **Managing Pain**

Recent studies on chronic pain have shown some resistance of such pain to traditional medical treatments. The current trends in the treatment of chronic pain involve the use of an integrated approach. The aim of this project was to appraise the quality of nonpharmacological chronic pain CPGs and articles using the Critical Appraisal Checklist as outlined in Melnyk and Overholt (2011).

Otis (2007) found that cognitive behavioral therapy (CBT) is an efficient tool for managing chronic pain. Fishman et al. (2009) suggested that the rate of suicide among chronic pain patients is 2 times greater than that seen in the general population. Suicidal ideation occurs in 5% to 14% of patients who experience chronic pain. The ultimate impact of CBT is that the veterans experience a better QOL. Chronic pain negatively influences the QOL of veterans. Current therapies alone are not effective in decreasing pain and advancing the amelioration of veterans' lives.

### **Use of Opioids**

Opioids are listed as the “cornerstone acute nociceptive pain management” (Rhodes et al., n.d.). The inadequate treatment of pain has led to abuse of opiates and reduced QOL outcomes. However, that approach is changing, as many are dying of drug overdoses and drug misuse. It is astounding to note that enough opiates are sold to

medicate every adult in the United States for 30 days with 5 milligrams of opioid drugs (Centers for Disease Control, 2011).

### **Developing Quality Recommendations**

Many CPGs lack rigorous review and consistent research. Therefore, it is crucial to determine the quality of CPGs and articles on chronic pain. Analyzing evidence-based nonpharmacological chronic pain CPGs and articles to determine quality is essential to providing superior care to those veterans experiencing chronic pain. Chronic pain, in addition to substance abuse, is a risk factor for suicide (Ligen et al., 2013; Smeeding et al., 2010). Ligen et al. (2013), in a study of patients served by Veterans Health Affairs (VHA;  $N = 4,863,086$ , retrospective analysis of the National Death Index), compared particular chronic pain conditions in terms of increased risk of suicide. The results of the study indicated that suicide risk is significantly higher for those with psychogenic pain, migraines, and back pain. Patients with psychogenic pain may very well be those patients with associated emotions.

Critical appraisal was the method for analyzing articles. The review included the following: cognitive behavioral therapy, self-management education, hands-on-therapy, mind-body practices (yoga, tai chi, music therapy), and energy therapy (acupuncture).

### **Relevant Literature Evidence**

Although only a small body of knowledge exists concerning complementary alternative medicine, evidence from the literature supports the complementary approaches selected. It is evident that the body of knowledge in this area is increasing. One intent of this project is to provide veterans with an instrument that describes their

pain in a like manner, such as the Defense and Veteran Pain Rating Scale (DVPRS) 0-10 pain scale (see Appendix A). For example, if a patient describes pain as a number outside of the 0-10 pain scale it has no meaning, educating veterans regarding the 0-10 scale allows them to communicate in the same language as their providers when describing pain. Additionally, the use of this instrument eliminated ambiguity. For example, when a veteran states, “My pain level is 8” in reference to the 1-10 scale, the meaning is clear.

Pain assessment is essential in managing chronic pain. The DVPRS was developed to bring consistency to the pain rating scale (Buckenmaier et al., 2013). The scale provides transparency through the use of a “traffic light” system as an approach to providing care. The system uses a traffic light as a way to define the level of pain. For example, mild pain corresponds to Levels 1-4 on the scale, which are associated with the color green on the traffic light. Likewise, the color yellow corresponds with Levels 5-6, and the color red corresponds with Levels 7-10 (Buckenmaier et al., 2013). The DVPRS allows the patient to describe his or her pain in terms that health care providers can interpret with consistency (Buckenmaier et al., 2013; Gibson, 2012;). While this scale is ultimately subjective, it does provide a mechanism whereby team members can collaborate on strategies for the patient regarding pain management (Buckenmaier, 2013; Gibson, 2012;).

Patients experiencing pain want their pain to be validated and relieved. It is important that patients receive validation of their pain and learn pain management strategies. CBT educates patients on how to apply appropriate coping skills in managing their pain. The patient should not expect a miraculous cure. As part of a coping skillset,

the patient may learn relaxation and stress management techniques. The patient may learn how to pace activities, how to identify maladaptive thoughts about pain, and how to cope with these thoughts. Sleep hygiene education may provide the patient with ways to obtain higher quality sleep (Fishman et al., 2009; Otis, 2007).

### **Complementary Alternative Medicine (CAM)**

CAM is not, as a rule, used in conjunction with conventional medicine. However, some medical providers use a mix of conventional medicine and complementary medicine, referred to as *integrative medicine* (Bruce & Harrison, 2013; Mayo, 2011; Smeeding et al., 2010). Smeeding et al. (2010) reported that veterans are using CAM therapy in large numbers. However, there is not documentation of these veterans' outcomes or their quality. It is necessary to implement CAMs under conditions in which CAMs can be evaluated. The use of the Critical Appraisal Checklist aided in determining the quality of CAMs that can lead to safe and effective outcomes.

In one longitudinal research study, the researchers offered a compelling argument that supported the use of CAM therapy in combination with conventional medicine (Smeeding et al., 2010). The study showed evidence of improvement in pain analogous to depression and anxiety (Smeeding et al., 2010).

CAM therapies are low cost with minimal risk and side effects (Fishman, 2013; Smeeding et al., 2010). The Veterans Administration Integrative Clinic and Health Program in Salt Lake City conducted an outcome evaluation for chronic pain. The outcome evaluation recommended the use of acupuncture, yoga, and meditation. (Smeeding et al., 2010). These therapies also empower veterans to use skills as needed to

alleviate discomfort or pain to acceptable levels (Smeeding et al., 2010). The results of the outcome evaluation demonstrated low cost, low risk, and improvement in the QOL of veterans.

It is reasonable to believe that there would be a reduction in the use of opiates with the implementation of guideline recommendations for chronic pain. Reduction in opiate use has resulted in improved QOL (Zunin, Orenstein, Chang, & Cho, 2009). In the words of Gibson (2012), the use of opiates causes “confusion, and deterioration of cognitive performance, by potentially interfering with the recovery process” (p. 761). While clinical practice guidelines provide a systematic process for the clinician to follow, research literature may have the expected rigor. The process for developing CPGs may be flawed because of the limited quality of research. The use of the Critical Appraisal Checklist provided a systematic process to determine the quality of current evidence.

Although there are hundreds of CAM therapies available, the ones recommended are evidence-based and deal with chronic pain. Mind-body practices are those predicated on belief in a connection between the mind and body (Mayo, 2011). For example, yoga, tai chi, meditation, and music therapy have been found to reduce chronic pain (Mayo, 2011).

The prevalence of chronic low-back pain in military veterans accounts for 25% to 60% of chronic pain among military personnel. Groessl, Weingart, Johnson, and Baxi (2012) conducted a study with veterans who completed pre-and posttest questionnaires to measure pain, depression, and QOL. While yoga is not gender specific, the results indicated that female veterans participated in and benefited from yoga (Groessl et al.,

2012). Groessl et al. (2008) recommended yoga as an appropriate intervention for veterans with low back pain. Groessl et al. (2008) conducted a nonfunded study that allowed veterans to participate in yoga once a week for 8 weeks. The type of yoga used in this study was Anusara yoga, which is a form of hatha yoga. Hatha yoga focuses on deep breathing, cognitive exercises, and yoga postures.

Zheng and Xue (2013) stated that CAM therapies are commonly and frequently used among veterans for chronic pain. There are multiple individuals using CAM without evidence-based knowledge that might or might not support the specific modality used. Further, the research quality of CAM studies needs improvement. Specifically, researchers and practitioners should involve different disciplines when examining various therapies simultaneously.

Many veterans use CAM therapies including yoga, meditation, massage, acupuncture, tai chi, music therapy, and cognitive behavioral therapy. This list does not encompass all the CAMs available; however, CAM is becoming mainstream as multidisciplinary teams and clinicians look for ways to provide veterans with the tools necessary to improve their QOL. The Stetler model guided this project. According to Gibbons et al. (2014), the use of evidence-based therapies in collaborative practice reduces stigma.

The National Center for Complementary Alternative Medicine (NCCAM) is a center located within the National Institutes of Health (NIH). The mission of NCCAM is to determine the utility and safety of CAM through evidence-based methods. CAMs are defined as those practices that are outside of conventional medical practices (Bruce &

Harrison, 2013; NIH, 2013). Reid et al. (2008), addressing self-help interventions such as music therapy, tai chi, and yoga, noted that yoga provided relief for seniors with chronic pain in 96% of studies reviewed.

There are weak recommendations for tai chi and music therapy in the management of chronic pain (Jonas, 2014). A systemic review has identified that tai chi has a positive effect on arthritic pain in the short term (Hall, Maher, Latimer & Ferreira, 2009). The American College of Physicians and the American Pain Society (2007) recommends the use of acupuncture, massage therapy, yoga, and cognitive behavioral therapy for patients with chronic low back pain. These strategies allowed the veteran choices of alternatives that may allow for an improved QOL. The recommendation includes CAM such therapies as yoga, meditation, tai chi, and acupuncture. Fishman et al. (2009), has suggested that emerging evidence indicate CAM therapies are safe, effective, and less costly.

### **Hands-On Therapy**

Massage is a hands-on therapy that was also addressed in the project. Massage therapy is used to manipulate muscles and tissues (Bruce & Harrison, 2013). Cochrane conducted a systematic review of massage from the inception of Medline, Embase, and CINAHL through 2008. The findings indicated that the massage was efficient and long lasting when combined with training and exercise (Furlan, Imamura, Dryden, & Irvin, 2010). Furlan et al. (2010) pointed out that massage could be costly. However, the cost of the massage, could offset the cost of provider visits, medication, and ongoing back care (Furlan et al., 2010).

## **Mind–Body Practices**

Meditation is an intervention that allows individuals to relax. Meditation is used for various conditions including, depression, pain, sleep, and anxiety, and is considered safe for healthy individuals (Mayo Clinic, 2011). A randomized clinical trial suggested that an arranged configuration of meditation be useful in the reduction of chronic pain (Wong et al., 2013). Literature has identified evidence of improved QOL among chronic pain patients using meditation (Reiner, Tibi, and Lipsitz, 2013). However, in a systematic review utilizing the “rapid evidence assessment of the literature” (REAL), there is a definite recommendation for music, tai chi, and yoga (Jonas, 2014). However, the evidence is not strong. There is no recommendation given for meditation from the Jonas review (2014). It should be noted that there is initial evidence that supports the use of CAMs in combination with integrative therapy (Longacre, Silver-Highfield, Lama, & Grodin, 2012). There are also indications that the practical use of CAMs is not realized due to the poor state of some research studies.

Yoga is the combination of physical postures, breathing exercises, and meditation and may be an effective treatment for patients who are unresponsive to pharmaceuticals (Streeter, Gerbarg, Saper, Ciraulo, & Brown, 2012). As Groessl et al., (2008) have noted with yoga, there are improved outcomes with yoga intervention. Furthermore, it was observed that VA patients may be more elderly and economically challenged in comparison to the general U.S. population. There are questions regarding mind and body effectiveness continue to exist; however, current literature reviews demonstrate the benefit of these therapies. Using mind-body interventions as part of therapy can have a

positive impact on the stress response. In addition, mind –body therapies increase pain tolerance, increase self-esteem, increased energy, and relaxation (Kim, Schneider, Kravitz, Mermier, & Burge, 2013).

Tai chi is a gentle form of dance or constant movement, which is supported by deep breathing exercises and is a safe form of meditation (Mayo Clinic, 2011). Tai chi is described as “meditation in motion” (Mayo Clinic, 2011, p. 17). Tai chi is considered, to be safe and cost-effective. According to Khusid, (2013) tai chi is a safe and effective modality to use in chronic pain management. Jonas (2014) in his review gave tai chi a weak recommendation. The review was based on the rapid review assessment expert panel findings in evidence-based literature.

Music therapy is relevant to the veteran population. Music therapy was a technique that was utilized with convalescing service members in Army hospitals in 1945 (AMTA, 2014). Also, the profession of music therapy grew out of research supported by the Army and the Office of the Surgeon General. Music therapy is necessary for the military and veteran culture (AMTA, 2014). The clinical use of therapeutic music to ease the pain (Korhan et al. (2014). Music therapy has shown some efficiency in the reduction of pain levels and a decrease in the use of opioids. However, according to Cepeda (2015), the clinical impact of music therapy remains inconclusive.

A controlled randomized study by Guetin et al. (2012) underpins the use of music therapy as a tool for managing chronic pain. The use of music reduced the need for medications for pain relief. Music therapy helps individuals with the management of stress, promotion of wellness, memory enhancement, and pain alleviation (AMTA,

2014). In addition, music therapy allows an individual to express their feelings, improve communication, and enhance physical rehabilitation (AMTA, 2014). The selection of music therapy encompasses music creativity, singing, and moving to the sound of music (AMTA, 2014). It is important that there be cultural differences in music. The technique used in the selection is flexible. Music therapy is evidence-based.

### **Energy Therapy**

During an acupuncture procedure, an acupuncturist inserts needles into the skin to affect the flow of energy. The needles are manipulated to produce electrical stimulation. Evidence indicates that acupuncture is effective in relieving chronic pain. A summary of research that included Chinese, Americans, Australian, and British showed that the acupuncture was effective for pain relief and improved QOL (Sherman, 2012).

### **Summary of Evidence**

Based on the current evidence from an extensive literature review, which included multiple databases, chronic pain is an epidemiological problem. It was determined that there is inadequate treatment of pain, which has led to a poor QOL for veterans without pain relief. This inadequate treatment has contributed to misuse and abuse of opiates, which has adversely affected the morbidity and mortality of veterans.

Evidence suggests that the most efficient way to manage chronic pain is to include all disciplines in a collaborative or integrative model (Dickinson et al., 2010). Current evidence suggests that yoga, tai chi meditation, music therapy, acupuncture, and CBT are effective interventions in managing pain in some patients. Yoga is a synthesis of

bodily postures, breathing exercises, and meditation (Streeter et al., 2012). Tai chi is also considered safe to use in pain management.

Tai chi is described as meditation in motion (Mayo, 2011). Meditation has also received some support in pain management and was used in this project. The Jonas review (2014) does not uphold the use meditation in chronic pain management. However, evidence in multiple other studies weakly supported the use of meditation (Mayo, 2011; Reiner et al., 2013; Wong, 2013;). Music Therapy is a traditional modality utilized in the military environment. There is evidence to sustain the use of music in pain management (Korhan et al., 2014). Acupuncture that is an energy therapy is an accepted modality in the VA. Acupuncture has been proven to be useful in managing chronic pain (Taylor, Pezzullo, & Bensoussan, 2013). Sherman has found acupuncture to be effective for use in the management of chronic pain and showed an amelioration in patient's Q outcomes (Sherman, 2012).

### **Conceptual Models /Theoretical Framework**

The Stetler model provides the foundation for safe and effective evidence-based practice (Stetler, 2001). The Stetler model (2001) is effective because the focus of this project is the ability of a clinician's ability to ascertain the quality of CPGs and articles based on the critical appraisal result. There are five phases or steps in this model. The phases are preparation which is the decision-making phase, validation which is organized and carried out through evidence-based review, comparative evaluation/ decision is managed and carried out through evaluation and synthesis tables and translation into clinical applicability and resultant evaluation (Stetler, 2001).

Phase 1 preparation is a decision- making and prioritization phase. It is important to do literature review to identify the evidence to be used in this project. Phase 2 incorporates a validation process through a review of the literature. Criteria used for reviewing the literature consist of seven levels, as identified by Polit and Beck (2008) (Appendix C): Level I), a systematic review; Level II), a single RCT; Level III), a correlational systematic study; Level IV), a correlational study; Level V), a “systematic review of descriptive qualitative studies;” level VI), a descriptive study; and level VII), opinions of authorities and expert committees.

Phase 3 consists of comparative evaluation and decision-making. The aim of this project is to appraise the quality of nonpharmacological chronic pain CPGs and articles. During this phase, the evidence table and synthesis table was utilized as to organize and depict similarities and differences. The clinical practice guidelines and articles was identified during the literature review.

During Phase 4, the interpretation of the findings was made, and their applicability was determined. The application of the guidelines or literature was based on the findings of the synthesis table as outlined in Melnyk and Overholt (2011). The application of the quality of the CPGs and articles that meet the inclusion criteria was determined by the results in the evidence table. The synthesis table compared the design, sample, and outcome across studies. Phase 5 consists of an evaluation of the characteristics of CPGs and current articles on nonpharmacological pain management. The appraiser made the following assessments: Was there an increase in the QOL, and,

decreased pain as a result of the non-pharmacological interventions? I as the appraiser made the recommendations for practice.

### **Summary**

A review of the literature provides the best evidence available for use in CBT and CAM. Chronic pain is a common global problem that is particularly challenging to the veteran population. There is some resistance to current therapies advocated to treat chronic pain; moreover, the use of opiates has not been successful in treating chronic pain. Patients are typically seeking validation of their pain (Allcock et al., 2009), among veterans using a collaborative or integrative practice may offer the best opportunity to improve their QOL. The focus is on nonpharmacological methods that manage pain and establish quality. The critical appraisal checklist does not require one to be an expert to use the checklist to evaluate CPGs and articles on chronic pain. The aim of this project is to appraise the quality of nonpharmacological chronic pain CPGs and articles using the critical appraisal process to include evidence and synthesis tables. Section three includes project design and methods, inclusion criteria, exclusion criteria, structure of the critical appraisal methods, protection of human subjects, evaluation plan, data analysis, and summary.

### Section 3: Methodology

#### **Project Design/Methods**

The purpose of this project was to analyze chronic pain CPGs and articles to determine the quality of each article or CPG. In this section, I address the inclusion criteria, exclusion criteria, structure of the critical appraisal methods, protection of human subjects, evaluation plan, and data analysis. A comprehensive literature review was conducted following an evidence-based review of the literature performed from August 2013–December 2014. The following databases were searched: Cochrane Database of Systemic Reviews, evidence-based Resources from Joanna Briggs, CINAHL Medline, Thoreau, Google Scholar, PsycINFO, and Up-to-Date, an evidence-based database. The following search terms were used to search for evidence related to the question guiding this review (What is the level of quality of the nonpharmacological chronic pain methods available from CPGs and articles?): *nonpharmacological methods for chronic pain/quality of life /AND/ complementary alternative medical practices /AND/ chronic pain / veterans /AND/ quality of life and chronic pain /AND/ chronic pain and nonpharmacological intervention /AND/ chronic pain and yoga /AND/ effectiveness of yoga and chronic pain /AND/ chronic pain and massage /AND/ effectiveness of chronic pain/massage /AND/ chronic pain and music /AND/ effectiveness of music and chronic pain /AND/ massage and chronic pain /AND/ chronic pain and massage /AND/ effectiveness of massage and chronic pain /AND/ acupuncture and chronic pain /AND/ chronic pain and acupuncture /AND/ tai chi and chronic pain /AND/ chronic pain and tai chi /AND/ cognitive behavioral therapy and chronic pain /AND/ cognitive behavioral*

*therapy and chronic pain /AND/ yoga, music therapy, acupuncture, massage, tai chi, and cognitive behavioral therapy and chronic pain.* Major sections of Section 3, include the project design, methods, inclusion criteria, exclusion criteria, the structure of the critical appraisal methods, protection of human subjects, evaluation plan, data analysis, and summary.

Using the Critical Appraisal Checklist enabled me to identify the highest quality guidelines. These quality guidelines assist veterans in making important decisions about appropriate nonpharmacological chronic pain plans. Nonpharmacological guidelines or articles were analyzed pertaining to the following: yoga, music, tai chi, acupuncture, massage, and CBT. The systematic review was guided by evidence-based articles, and the CPGs used in this project were peer reviewed. Levels of evidence were determined using Polit and Beck's (2008) level of evidence criteria (see Appendix C). The articles and CPGs were graded as follows: Level of Evidence Type 1, systematic reviews of RCTs; Level Type 2, single RCT; Level 3, correlational, systematic study; Level 4, correlational study; Level 5, systematic review of descriptive qualitative studies; Level 6, descriptive/qualitative studies; and Level 7, opinions of authorities and expert committees.

I as a scholar and practitioner was the sole appraiser for this project. I as the student is a military veteran and a nurse practitioner. has received training on the clinical appraisal methodology in the classroom and in theory (Melnyk & Overholt, 2011). Clinical appraisal methodology may be used to measure the transparency and rigor of guidelines or articles through the following clinical questions: (a) What are the results?

and (b) Are the studies valid and applicable to the questions? Melnyk and Overholt's (2011) evaluation table was used to provide direction for this systematic review. The evaluation table included the citation, conceptual framework, design/method, sample or setting, level of evidence, data analysis, findings, appraisal, and worth to practice.

What is the level of quality of the nonpharmacological chronic pain methods available in CPGs and articles? The outcome variable indicated the level of quality. Additionally, the level of evidence and quality of evidence indicated the vigor with which the evidence can be used. Internal validity was based on the independent variables, which in this project included interventions involving music, massage, tai chi, yoga, acupuncture, and CBT and how they influence the dependent variable, the outcome. The desired outcome was an increase in QOL and/or reduced pain. Based on these criteria, recommendations were made concerning applicability to practice. This information was displayed in the evaluation table and was used to develop a synthesis. The level of quality was measured through the level of evidence of each article or CPG based on Melnyk and Overholt (2011). The level of quality was determined by the critical appraisal of the articles and CPGs. The variables were measured using an evidence-based synthesis table with the interventions and comparison of the independent variables, design, and outcome.

### **Inclusion/Exclusion Criteria**

The systematic process used in this project involved inclusion and exclusion. The inclusion criteria for this systematic review were applied to all articles and CPGs. In this comprehensive systematic review, the following CAM practicesyoga, music, tai chi,

acupuncture, massage, and CBT were reviewed. This systematic review was limited to articles and guidelines concerning adult males and females (older than 18 years of age) with noncancer musculoskeletal chronic pain. The desired outcome was improvement in QOL and reduction in pain. For this systematic review, sources applying to individuals younger than 18 years of age or patients suffering from headache, cancer-related pain, fibromyalgia, mental health problems, and gynecological pain were excluded. The outcomes were based on the results of critical appraisal evaluations as outlined in Melnyk and Overholt (2011). The Critical Appraisal Instrument was intended to measure the quality of each article. Use of the critical appraisal methodology helped me to identify CPGs or articles by level of evidence and to make quality decisions regarding recommendations for practice.

### **Structure of the Critical Appraisal Methods**

The structure of the critical appraisal included critical appraisal of CPGs and articles on nonpharmacological methods. I used the rapid appraisal checklist provided in the Melnyk and Overholt (2011) text. Checklist items included the following: (a) rapidly critically appraise randomized clinical trials (RCTs), (b) rapidly critically appraise qualitative evidence, (c) rapidly critically appraise evidence-based CPGs, (d) rapidly critically appraise case-control studies, (e) rapidly critically appraise cohort studies, and (f) rapidly critically appraise systematic reviews of clinical interventions/treatments (Melnyk & Overholt, 2008; see Appendix D).

### **Protection of Human Subjects**

It is important that human rights are protected in the conduct of research. I completed the NIH Certificate of Human Rights Protection course and received the required certificate. Prior to initiation of this systematic review, I received Institutional Review Board (IRB) approval from Walden University. The IRB approval number is 08-01-0353521.

### **Evaluation Plan**

The Stetler model (2001) was the method used to evaluate the characteristics of critical appraisal responses to the CPGs and articles on nonpharmacological methods. The goal was to determine the quality of the articles and CPGs so that recommendations could be made as to the utility of nonpharmacological methods for managing pain. The evaluation was based on validity, reliability and applicability for use in nonpharmacological management. I compiled the results and made recommendations concerning each CPG or article based on my assessment.

### **Data Analysis**

Data from the critical appraisal form on chronic pain CPGs and articles were appraised using an evaluation table. The quality and level of evidence were determined for each article and CPG. The data analysis was based on the evidence on the Critical Appraisal Checklist. I made two decisions: First, I rated the quality of the CPG or article, and then I made a recommendation based on the results of the Critical Appraisal Checklist.

### **Summary**

Chronic pain impacts QOL for veterans. Chronic pain is a main cause of disability nationally and particularly within the veteran population (DeCarvalho, 2007). The use of pharmaceuticals to treat chronic pain has led to limited success. The aim of this project was to analyze the quality of nonpharmacological chronic pain CPGs and articles through the use of the Critical Appraisal Checklist, which facilitated a systematic process of analyzing evidence. It is important during analysis to establish validity, reliability, and applicability (Melnyk & Overholt, 2011). In addition, a self-report of me as a scholar, practitioner, and project developer demonstrated the growth of me as a student.

## Section 4: Findings and Recommendations

### **Introduction**

Chronic pain is an illness that impacts millions of people worldwide. It is a significant disease process that particularly impacts the QOL of many veterans with undertreated or untreated pain. The aim of this project was to conduct a systematic literature review to assess nonpharmacological methods of pain management. In this section, I assess the systematic literature review, using critical appraisal as a guide for the systematic process.

Table 1 lists articles that I excluded from the literature review. Table 2 is an evaluation table and lists articles that were included in the systematic review. Table 2 includes the following information on each article: citation and year, conceptual framework, design, sample and setting, intervention, analysis of the data, study findings, and worth for practice. The purpose of the evaluation table is to answer questions related to the appraisal. Table 3 includes design, sample, and outcome. The synthesis table addresses how the studies differ from or are similar to one another. The CPGs are presented in alphabetical order, followed by pilot studies and a general systematic review of articles in alphabetical order. The evidence was assessed according to Melnyk and Overholt's (2011) Critical Appraisal Guide (see Appendix D) and Polit and Beck's (2008) hierarchical evidence levels (Appendix C). In the latter, Level I includes systematic reviews of RCTs and non-RCTs; Level II includes single RCTs or non-RCTs; Level III includes systematic reviews of a correlational or observational study; Level IV is a correlational study; Level V includes systematic reviews of a descriptive or

qualitative study; Level VI involves a single descriptive, qualitative, or phonologic study; and Level VII involves the opinions and judgments of authorities and participants on expert committees.

### **Evaluation Findings and Discussion**

The systematic process incorporates a literature review that includes CBT, massage therapy, tai chi, yoga, music therapy, and acupuncture. Using a number of word combinations, a total of 1,666 articles were produced. The number of articles remaining after duplicates were removed was 859. Eight hundred articles were excluded based on their abstracts. Sixty exhaustive text articles were appraised for their eligibility; 23 of these articles were excluded (the rationale for exclusion is provided). Thirty-seven articles met criteria for inclusion. Nine CPGs were appraised.

### **Exclusion Criteria**

For the purposes of this systematic review, studies focused on patients less than 18 years of age and patients suffering from headaches, cancer-related pain, fibromyalgia, mental health problems, or gynecological pain were excluded.

Table 1

*Exclusion Table*

Author(s), year	Article	Rationale
Allen, 2009	“Chronic Low Back Pain: Evaluation and Management”	Does not address QOL or pain management. Article on evaluation and management referred to low benefit of acupressure and pressure point massage.
Brasil et al., 2008	“Quality of Life of People With Chronic Pain After Acupuncture Treatment”	Excluded because article is not in English.
Centre, 2009	“The Effectiveness of Tai Chi for Chronic Musculoskeletal Pain Conditions: A Systematic Review and Meta-Analysis” (Structured Abstract)	This abstract addressed arthritis and tension headache.
Cepeda, 2015	“Music for Pain Relief”	Based on abstract, children.
Cramer, 2013	“‘I’m More in Balance’: A Qualitative Study of Yoga for Patients with Chronic Neck Pain”	Influence of yoga on body perception.
Crawford, 2014	“Sensory Art Therapies for the Self-Management of Chronic Pain Symptoms”	Based on a mixed diagnosis to include cancer pain, fibromyalgia.
Crawford, 2014	“An Analysis of the Various Chronic Pain Conditions Captured in a Systematic Review of Active Self-Care Complementary and Integrative Medicine Therapies for the Management of Pain Symptoms”	Excluded because the focus was on an analysis of pain conditions and not on QOL or pain intensity.

*(table continues)*

Author(s), year	Article	Rationale
Denneson, Corson, & Dobscha, 2011	“Complementary and Alternative Medicine (CAM) Use Among Veterans With Chronic Noncancer Pain”	Focused on the willingness of veterans to use CAM for the treatment of pain.
Eaves et al., 2014	“Modes of Hoping: Understanding Hope and Expectation ....”	More about the expectations.
Eaves et al., 2015	“A Qualitative Study of Changes in Expectations Over Time Among Patients With Chronic Low Back Pain Seeking Four CAM Therapies”	The focus of this project is on patients’ expectations about treatment and greater acceptance of pain.
Ehde, Dillworth, & Turner, 2014	“Cognitive Behavioral Therapy for Individuals with Chronic Pain Efficacy: Innovations and Directions for Research”	Snippets of information by three authors supporting efficacy, innovations, and directions for research of cognitive behavioral therapy.
Gold & Clare, 2012	“An Exploration of Music Listening in Chronic Pain”	More about the “the lived experience.”
Gregory, 2014	“Dealing With Acute and Chronic Pain”	Does not address pain and QOL. Addresses the role of the community nurse.
Guevara-Lopez, Covarrubias-Gomez, Elias-Dibs, Reyes-Sanchez, & Rodriguez-Reyna, 2011	“Practice Guidelines for the Management of Low Back Pain”	Guidelines are in Spanish.
Hall, Maher, Latimer, Ferreira, & Lam, 2009	“A Randomized Controlled Trial of Tai Chi for Long-Term Low Back Pain: Study	This is a protocol.

Author(s), year	Article	Rationale
	Rationale, Design, and Methods”	<i>(table continues)</i>
Rocha et al., 2012	“Improvement in Physiological and Psychological Parameters After Six Months of Yoga Practice”	Specific outcomes for anxiety, depression, and stress.
Samwel et al., 2009	“Multidisciplinary Allocation Of Chronic Pain Treatment: Effects and Cognitive-Behavioral Predictors of Outcome”	Studies include pain in pelvis, belly, breast, head, and face.
Saper et al., 2013	“Comparing Once Versus Twice Weekly Yoga Classes for Chronic Low Back Pain in Predominately Low Income Minorities: A Randomized Dosing Trial”	Dosing of yoga without reference to QOL or pain benefit.
Schafer et al., 2022	“Complementary and Alternative Medicine (CAM) Providers View Expectations of CAM Therapies: A Qualitative Study”	This study presents a provider’s review on perception of the patient’s pain
Skillgate et al., 2015	“The Effect of Massage Therapy and/or Exercise Therapy on Subacute or Long-Lasting Neck Pain—The Stockholm Neck Trial (STONE): Study Protocol for a Randomized Controlled Trial”	This is a systematic review of 16 RCTs’ pending results.
Smeeding et al., 2010	“Outcome Evaluation of the Veterans Affairs Salt Lake City Integrative Health Clinic for Chronic Pain and Stress-Related Depression, Anxiety, and Post-Traumatic Stress Disorder”	There was too much psychopathology (depression, anxiety, PTSD) to determine which of the 10 CAMs improved chronic pain and QOL. Did not look at individual intervention effectiveness.

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Author(s), year	Article	Rationale
<i>(table continues)</i>		
Wieland, 2013	“Yoga Treatment for Chronic Non-Specific Low-Back Pain”	<i>Cochrane Database of Systematic Reviews, (7); Protocol from 2013.</i>
Yukari, Noriko, Yoshiki, & Mizue, year	“Literature Review of Pain Management for People With Chronic Pain”	This study identified possible nursing strategies for pain management and adopting a multimodal pain management program.

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### **Inclusion Criteria**

This systematic review was limited to materials pertaining to adult males and females (over 18 years of age) with noncancer musculoskeletal chronic pain. The desired outcome is improved QOL and decreased pain levels. For the purpose of this systematic review, materials pertaining to those less than 18 years of age and patients suffering from headaches, cancer-related pain, fibromyalgia, mental health problems, or gynecological pain were excluded.

Table 2  
*Evaluation Table*

Citation	Conceptual framework	Sample/ setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
Abdulla, 2013	CPG; Management of pain in a multidisciplinary approach in older individuals.	British Pain Society; 5,000 records identified.	I	CBT	Few studies on management of pain in older individuals. Lack of evidence.	Lack of evidence in studies reviewed.
Brosseau, 2012	Update CPGs on MT.	18 y/o or older adults with acute, subacute, and chronic pain.	I	MT	MT is beneficial for CLBP.	Outcome: Prescription for CLBP, further research for effects of dosage and techniques.
Carmody et al., 2013	Patients who receive CBT by telephone would show greater improvements in	Participants: military veterans, 55 and older in primary care clinics, San Francisco VA Medical Center and VA community outpatient clinics. Chronic pain for year.	II	CBT	Pain intensity is significantly improved.	Outcome: Significant improvement in pain.
Cramer, Lauche, Haller, & Dobos, 2013	Effectiveness of Y in patients with CLBP.	10 RCTs; 967 patients included in study.	I	Y	Y reduced pain. Y did not improve QOL.	Outcome: Pain improved; QOL not improved.

(table continues)

Citation	Conceptual framework	Sample/setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
Chou & Huffman, 2007	CPG NP CLBP review of evidence-based literature for the American Pain Society and the American College of Physicians CPG.	18 y/o older, English language or non-English translated. Nonpregnant, Outcome pain.	I	MT, AC, CBT	Good evidence to support CBT. Fair evidence supports the use of MT, viniyoga, and AC versus sham AC.	Outcome: CBT is the only therapy with good evidence.
Chou et al., 2007	CPG Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society.	Adults 18 y/o, acute and chronic low back pain.	I	AC, Viniyoga-style Y, MT, CBT		Outcomes: Pain. There is moderate-quality evidence and weak recommendation for viniyoga, MT, and CBT.
Hassett, 2011	Approach to treatment involves both NP and pharmacological methods. CPG.	Unknown.	I	CBT, Y	Frontline to pain management is pharmacological. Providers should consider NP methods.	Outcome: Decreasing pain. Strong evidence base for CBT.
Fletcher et al., 2016	Perception of other integrative health therapies by veterans with pain who are receiving MT.		0	MT	Inpatients and outpatients reported a decrease in pain of 1-3 points on a 0-10 scale.	Pilot study.
Foulad-bakhsh, 2012	Overview of CAM therapies used to prevent, control, and manage osteoarthritis.	ROL	VII	Y, TC, AC, MT	Extensive ROL.	No recommendations made.

(table continues)

Citation	Conceptual framework	Sample/setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
Groessler et al., 2012	CPG to appraise the significance of Y intervention for women with CLBP—offered at the facility since 2003.	Female veterans, 53 participants, VA, San Diego.	IV	Y	Unsure.	Outcome: Small sample.
Groessler et al., 2008	Benefit of Y for VA patients.	Male and female veterans, VA San Diego.	IV	Y	Decrease in pain and conclusions indicate a need for large RCT.	Outcome: May help VA patients with CLBP.
Hsu et al., 2014	New perspectives on patient expectations of treatment outcomes.	Participants: 64, in Tucson, AZ and Seattle, WA.	VI	Y, AC, MT.	Patient expectations.	Outcome treatment clusters pain relief and QOL.
Hinman et al., 2014	Ascertain the benefit of laser and needle AC as treatment for chronic knee pain.	282 patients age 50 y/o with chronic knee pain in Victoria, Australia.	II	AC	Improvement in pain after treatment. However, this is not sustained.	Outcome: Neither laser nor needle conferred benefit over sham.
Jonas, 2014	Review the quality of individual studies on CAMs.	SR	I	Y, TC, MUT	Active, self-care,	Outcome: Weak recommendations for Y, TC, MUT.
Knoerl, Smith, & Weisberg, 2016	Determine CBT doses, methods, strategies for chronic pain.	35 studies	I	CBT	43% indicated decrease in pain intensity, increase in QOL.	Outcome: Decrease in pain and increase in QOL.
Lauche, 2016	The effects of TC and neck exercises in the treatment of chronic nonspecific neck pain.	114 participants	II	TC	Significant group difference in favor of TC over waitlist—50% pain reduction.	Outcome: More effective than no treatment to improve pain and QOL. Improved QOL.

(table continues)

Citation	Conceptual framework	Sample/setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
Lee, Crawford, & Hickey, 2014	“Mind-Body Therapies for Self-Management of Chronic Pain Symptoms.”	146 RCTs.	I	Includes TC, Y	Poor quality studies.	Unable to make recommendation of any of the mind-body therapies.
Lee, Crawford, & Shoemaker, 2014	To assess patient-centered complementary and integrative medicine	146 RCTs; 30 investigated movement therapies. Participants = 2,014.	I	TC, Y	TC safe. Y relatively safe.	Outcome: TC and Y weak recommendations for LBP.
Liang, Zhu, Yang, Fu, & Yu, 2009	Establish the benefit of traditional AC for chronic neck pain.	178 patients.	0	AC	Traditional AC is effective.	Pilot study.
Little et al., 2008	Determine effectiveness of lessons in the Alexander technique, MT in back pain.	64 general practices in England; 579 participants.	II	MT		Outcome: MT effective in short term. Improved QOL.
Mehl, Mainguy, & Plummer	CAM therapies in primary care to reduce opiate use in a rural setting.	<i>N</i> = 272 patients.	IV	Yoga & TC	On a 10-point scale, pain intensity—pain ratings, average 0.19 95% CL.	Significant improvement in pain level, QOL.
McKee et al., 2013	Described outcomes of AC use in healthcare disparities as it relates to pain management.	Primary care patients who are 21 and older with chronic pain: 226 patients	II	TC	Pretreatment, 95% CI, <i>p</i> value < .001.	Outcome: Significant improvement in pain and QOL.

(table continues)

Citation	Conceptual framework	Sample/setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
MacPherson et al., 2015	Evaluate the effectiveness of Alexander technique lessons or AC vs chronic neck pain.	UK primary care, 517 patients.	II	AC	3.92 (95% CI, 0.97 to 6.87 percentage points).	Outcome: Significant reduction in chronic pain.
Monticone et al., 2015	Appraisal of the effects of CBT on chronic neck pain.	10 randomized trials; 836 participants.	I	CBT	Little evidence, CBT is better than no treatment.	Outcome: Low-quality evidence for improving pain and QOL.
National Guidelines Clearinghouse, 2016	CPG, nonsurgical management of chronic pain.	155 reviews.	I	None	None.	Outcome: Did not recommend CAM. Patient with chronic pain may use as desired.
Park & Hughes, 2012	Demonstrate efficacy of NP interventions in chronic pain management.	28 RCT intervention studies, senior population over 65.	I	AC, CBT, MUT	May be beneficial, unable to identify the most appropriate NP pain intervention.	Outcome: AC, CBT effective for CLBP in older patients with chronic pain. MUT may also be weakly beneficial.
Rubinstein et al., 2010	Effects of CAM on chronic back pain.	Adults 18 and up, nonspecific low back pain.	I	AC	Low-quality evidence.	Outcome: Low-quality recommendation.
Sang-Dol, 2016	Management of neck pain with Y.	Total of 3 trials.	I	Y	Small sample size. Poor quality studies.	Outcome: May be beneficial for Y.
Saper et al., 2009	To assess the use of Y for CLBP.	30 adults with CLBP in a racially diverse community in Boston, MA.	0	Y	Long-term retention of pain relief poor.	Pilot study.

Citation	Conceptual framework	Sample/setting	LOE	Intervention(s)	Findings	Appraisal of worth to practice
						<i>(table continues)</i>
Tan et al., 2007	Efficacy of CAM for chronic pain.	Synthesize data, 1966-2006, 21 studies on MT RCTs, 6 on Y.	I	MT, Y, AC	Massage study is rated efficacious. Y probably efficacious. AC probably efficacious.	Outcome: MT, AC, and Y are beneficial.
Teut et al., 2016	Lessening of CLBP in older adults.	Adults 65 years or older CLBP: Berlin, Germany.	II	Y	Pain intensity not improved.	Outcome: Did not improve pain or QOL.
Webster & Markham, 2014	Medical management of CLBP: efficacy and outcomes.	ROL	VII	Viniyoga, CBT, AC	Gave example that sham AC is as effective AC.	Outcome: None listed.
Weib et al., 2013	Effectiveness of additional AC in patients with CLBP.	Sample 143: males, $N = 96$ , females, $N = 47$ , inpatient rehab facility in Germany.	II	AC	Pain better in 66.2% in the AC group.	Outcome: Recommend AC for inclusion in rehab unit.
Xu et al., 2013	MA to determine effectiveness of AC compared to sham to treat neck and back pain.	13 RCTs with 2,678 patients; China.	I	AC	Consistency in direction of pain intensity and QOL was poor; moderately better outcomes in treatment of low back pain.	Outcome: Recommend AC with other interventions.
Yuan et al., 2009	Pilot on CLBP to determine acupuncture treatment frequencies.	Sample $N = 30$ .	0	AC	No significant change; baseline, significant improvement.	Pilot study.

Citation	Conceptual framework	Sample/ setting	LOE	Inter-vention(s)	Findings	Appraisal of worth to practice
Zhang, Kong, Zhang, & Li, 2012	Appraisal of the impact of TCM on health-related quality and cost savings.	SR	I	TCM, TC	Demonstrated a lack of research on HRQOL. Need to develop and validate a tool to use with TCM.	( <i>table continues</i> ) Lack of efficacy.

*Note.* AC = acupuncture, CBT = cognitive behavioral therapy, CLBP = chronic low back pain, CPGs = clinical practice guidelines, HRQOL = health-related of quality of life.,MA = meta-analysis, MT =massage therapy, MUT = music therapy, NP = nonpharmacological, Q = quasi-experimental, QOL = quality of life, RCT = randomized controlled trial, ROL = review of literature. SR = systematic review TC = tai chi, TCM = traditional Chinese medicine, Y = yoga,

### Systematic Review of Literature

#### Clinical Practice Guidelines Literature Appraisal

**Level I.** In Polit and Beck's (2008) levels of evidence (Appendix C), level 1, consists of systematic reviews of RCTs and non-RCTs. The British Pain Society and British Geriatric Society took on the daunting task of conducting a systematic review to provide guidance for pain management in the elderly population (Abdulla et al., 2013). The systematic review strategy entailed search criteria that included a review of the abstract by two reviewers. Selection of the full article depended on the review by these reviewers. The review entailed a quality score by a third reviewer. While this systematic review did not specifically address nonpharmacological methods, it did include CBT and indicated that CBT might be useful for the elderly in nursing facilities (Abdulla et al., 2013).

Brosseau (2012) conducted a multidisciplinary systematic review of massage therapy for CLBP. The guidelines were funded by various entities including the Holistic Health Research Funds, the University of Ottawa Research Award. The Summer Students

Program, and Ministry of Human Resources also funded the systematic review. The aim of the study was to update the current clinical practice guidelines for massage therapy intervention. The Ottawa Panel of experts consisted of nine methodologists who consulted with professional organizations in Canada that treated patients with low - back pain. The panel employed quantitative grading system that utilized the appraisal of guidelines research and evaluation (AGREE) methodology (Brosseau, 2012). The participants were adults over the age of 18. The study involved comparison with a control group that did not have a massage intervention. For my systematic review, the primary interest is pain relief, and improved QOL. The results of this systematic review indicated pain intensity diminished in response to massage therapy (Brosseau, 2012). The Ottawa Panel found that massage was more effective than acupuncture but could not say why. One suggestion was that there is a vagal response associated with touch. Another proposed suggestion was that physiological responses, and stress hormones are lowered post massage. Several reasons were advanced but were not backed by scientific evidence. Limitations of the systematic review included the elimination of 16 studies because there was no way to isolate the effects massage therapy. The limitations were related to surgery or medication use. Another limitation was a lack of dosing and the type of massage therapy employed. The studies were limited to French and English articles. Although the Ottawa Panel recommended massage as an effective intervention for CLBP there was no evidence of improvement in the QOL.

The purpose of this clinical practice guideline by Chou and Huffman (2007) was to detail the benefits associated with, but not limited to acupuncture, back schools,

physical therapy (PT), CBT, and massage therapy. The guidelines were developed based on the outcomes of systematic reviews and RCTs. According to the authors, many clinicians recommend the use of noninvasive therapies. The guidelines were developed by convening a panel of experts from the America Pain Society and the American College of Physicians which decided which nonpharmacological studies to include in the guidelines. They provided a search of evidence-based sources from 1996 to November 2006. They primarily used systematic reviews, however, if a review was not located for a primary intervention, they included all relevant RCTs. For each review, they discerned such information as inclusion criteria, the procedure for rating, attributes of studies in the systematic reviews, and the number of quality trials for comparisons. They determined the internal validity of RCTs was not incorporated into a higher-ranking systematic review. The data synthesis was determined by methods used by the US Prevention Services Task Force. The team assigned ratings of good, fair, or poor. The studies of good and fair are the lowest quality ones that would be maintained. There are eight trials that included massage therapy. It was determined that there was no variance among manipulation and massage. There were 51 trials on acupuncture included in three systematic reviews. There were no systematic reviews for yoga effectiveness on low-back pain. The team identified and included three yoga trials. One limitation was the exclusion of non-English sources. The team found enough evidence, that CBT is useful for CLBP. Acupuncture was effective in relieving pain in comparison to sham acupuncture. Viniyoga received minimal supportive evidence. The expert panel espoused the belief that there are limited numbers of nonpharmacological choices available for

patients with CLBP. The findings of the various studies indicated that patients should be involved when making decisions. It is recommended that proven interventions be used. It was also recommended that consideration be given to nonpharmacological interventions with fair evidence with moderate benefit.

Chou et al.(2007) as a result of collaborations, came up with CPGs for the diagnosis and treatment of CLBP. These CBGs incorporate seven recommendations. Recommendation 1, included a concentrated history and physical examination; Recommendation 2, was a moderate recommendation that imaging for low back pain should be routinely recommended; Recommendation 3, suggested that imaging should be done when there is evidence of increasing neurological deficits or findings of physical history; Recommendation 4, was to use the MRI scan to evaluate patients with continuing signs and symptoms of radiculopathy. In addition, health personnel should consider using a CAT scan if there is a possibility of surgical intervention or steroid injection; Recommendation 5, suggested the provision of evidence- based education for patients with options; Recommendation 6, was consideration of the appropriate use of medications; Recommendation 7, was that the moderate use of nonpharmacological methods should be considered. These included CBT, massage therapy, yoga, or acupuncture. The American College of Physicians and The American Pain Society assembled a group of multidisciplinary experts to guide the recommendations based on systematic reviews and evidence-based literature between 1966 and 2006. Based on these expert's opinions acupuncture, massage therapy, CBT, and yoga are moderately effective in pain relief of CLBP. In-line with the desire to provide patient-centered care, patients

should always be consulted when choosing a nonpharmacological intervention. Patient opinion can influence the outcome.

Hassett and Williams (2011), coordinated a comprehensive systematic literature review to discuss the “nonpharmacological treatment of chronic widespread musculoskeletal pain.” The literature has discussed resorting to several nonpharmacological methods that include exercise and CBT. Yoga is mentioned only as a possible intervention to improve flexibility, aerobic fitness, and strength- training exercise. As mentioned, CBT can be a significant part of patient centered care. Hassett and Williams (2011) article contains foundational and derivative information on how CBT works. CBT is a combination of two therapies: behavioral and cognitive therapies. Behavioral therapy focuses on individual’s environment and how pain is reinforced through such strategies as avoidance or pain relief through inactivity. Cognitive therapy is and how the mind thinks in terms of managing pain. Cognitive therapy helps the individual refocus their thought’s and beliefs. These two therapies are combined to produce CBT which has three components education, skill training, and application. Hassett and Williams (2011), concluded that providers continued to use pharmaceuticals as a frontline approach to pain management. These researchers argue that while pharmaceuticals continue to be a frontline therapy, patient-centered care should be the focus. In addition, the intention is not to replace pharmaceuticals but augment treatment by the introducing of nonpharmacological methods (Hassett & Williams, 2011).

The VA/DoD developed CPGs for the nonsurgical management of osteoarthritis. (National Guideline Clearinghouse [NGC], 2014). These guidelines do not apply to

TriCare which is the military medical insurance company. The guidelines were developed by an evidence-based working group composed of members of the DoD and the VA. All adults within the VA/DoD system are eligible to receive care based on the evidence in these guidelines. The working group did a systematic appraisal of the evidence. One hundred-and fifty-five articles that were appraised. The both pharmacological and nonpharmacological interventions. The evidence-based group focused on patient-centered outcomes. The guidelines provide guidance for primary care practitioners in providing patient - centered care. The guidelines did not recommend any nonpharmacological therapies because they found no evidence to support the recommendation in this regard. However, a patient may explore the use of CAMs such as dietary supplements, acupuncture, and chiropractic care. The guidelines also mention that CBT was not considered as part of treatment.

Webster and Markman (2014) reviewed scientific literature and treatment guidelines to discuss the medical management of chronic low back pain. I have included the work of these authors in this section but considered Section V11 because the study may or may not be a systematic review. However, they did cite several systematic reviews, and it does appear to be a systematic review in some respects. In addition, several conflicts of interest was listed for Dr. Markman. The authors was focused more on etiologies and mechanisms that cause low back pain and then rated the following nonpharmacological interventions. They ascribed a fair to moderate net benefit to acupuncture, CBT. Viniyoga is rated fair with moderate net benefit. However, the authors did not recommend any of the nonpharmacological interventions in their findings. The

authors support personalized medicine and an integrative approach. Based on their review of the literature Viniyoga, CBT, and acupuncture provided credible reviews. The authors supported the combining of therapies for best outcomes.

**Level IV.** According to Polit and Beck (2008) Level IV consists of single correlational and observational studies. Yoga is a nonpharmacological method that has been offered to patients with low back pain since 2003 (Groessler, Weingart, Johnson, & Baxi, 2012). This review is listed as a clinical practice guideline and as a study. I have included it here as a single cohort. Chronic back pain is a major disease process and impacts 25% of US citizens. According to Groessler et al. (2012) the prevalence of chronic pain seems to have a major impact on those who served in the Gulf War. The rates of pain among these veterans range from 30-60%. Women are currently seeking more care at the VA and seem to bear a greater burden of pain than their male counterparts. Groessler et al. (2012) unfunded study were conducted at the VA using a sample of females. The key stakeholders were the Veteran Administration and veterans. No conflicts of interest were identified. The review team was interested in the effect of yoga on men and women in the VA. The study was conducted between 2005 and 2009. The design was a pre and post questionnaire completed by patients. A clinical yoga program for veterans with CLBP was presided over by specifically trained professionals. Fifty-three participants completed the study. The limitations of the study include single cohort, with a pre and post design. The measurement included was the “Outcomes study severity pain scale.” The scale was modified to add physical discomfort. The study was not randomized.

Therefore, the results are questionable. Thus, controversial these findings demonstrated amelioration in QOL with accompanying decreased pain.

Groessler, Weingart, Aschbacher, Pada, and Baxi (2008) conducted a research study with a questionnaire at baseline and again at 10 weeks with participants in a VA facility in San Diego, California. The outcome criteria included health-related, QOL and pain measures. The study indicated that patients with CLBP face a risk of reduced QOL and suggested that nonpharmacologic treatment approaches should be employed for pain relief or to improve the QOL as the treatment of choice. The authors discussed various types of hatha yoga (ashtanga yoga integral yoga, and Anusara yoga). Yoga has not been comprehensively studied as it relates what impact it has on pain and QOL. Many studies have employed small sample size and have not produced significant evidence of favorable HRQOL outcomes. The aim of this study was to assess the feasibility of doing a RCT for veterans with back pain (Groessler et al., 2008). The method used for the study was conducted by a yoga trained instructor. All patients were evaluated by a yoga trained physician before the start of the study. Participants were required to have a VA primary care provider, and to have experienced, benign CLBP that exceeded six months. This requirement of six months exceeds the normal time span for a definition of low back pain which is 90 days. The measures included a 0-10 pain scale, HRQOL, and patient demographic information. The 0-10 pain scale had an “internal pain consistency of 0.88 and 10- day test-retest reliability of 0.91” (Groessler, et al., 2008, p.1126). The study concluded that yoga may help veterans with low back pain. While yoga may not appeal to all veterans, it was useful as part of an approach to using nonpharmacological measures.

A study by Mehl-Madrona, Mainguy, and Plummer (2016) is included in the guideline section because the researchers suggest integrating CAM practices into primary care settings. The purpose of this 12-week pain education program was to reduce dependency on opiates in a VA rural medical setting. The article's purpose was to show the results of patients results in the application of CAM therapies during visits in a medical clinic. Because of the large number of patients who were on opiates, this presented an ethical dilemma in terms of medical management. This was a challenging scenario because it raised problems of how to take patients off while simultaneously offering them other options. The patients refused randomization because they wanted treatment as usual. They then developed a quality improvement program in which a physician managed all his patients on opiates as part of the group medical visit. Requirements for participation in the study were that patients had to take yoga, tai chi, and chiropractic therapy. The outcome measures included a change in opiate dosages, and changes in scores on modalities such a pain analog and visual analog rating scales. The results showed considerable enhancement in patient lives. In the comparison group, 48.5% of patients increased their dosages of opiates.

### **Pilot Studies**

A mixed -methods pilot study was implemented at the VA medical facility in the Ann Arbor VA Healthcare System, in collaboration with the National Center for Complementary and Alternative Medicine of the National Institutes of Health (Fletcher et al., 2016). This collaboration was for the purpose of promoting complementary and integrative health therapy at the VA. Thirty participants were selected for qualitative

interviews, 15 as outpatients and 15 as inpatients. Interviews were conducted after the consent forms were completed. The interviews varied from 3.02 minutes to 19.15 minutes for inpatients, whereas interview times for outpatients ranged from 7- 58 to 28-19 minutes. The patients in the complementary and integrative group experienced primarily musculoskeletal pain. Patients described chronic pain as being debilitating to the point that they could not think. Massage was beneficial to the patients because it “took the edge off.” While massage did not lead to complete remission of pain, it did make the patients feel better. Patients were to be weaned off such drugs as fentanyl through integrative practices that involved a pharmacist, a manual medicine provider, and massage. In addition, the patient’s mobility and flexibility increased. However, access was an issue because massage was not always available. Another issue was the distance veterans had to drive for care. Massage improved clinical outcomes, including improved pain management.

Liang et al., (2010) investigated the efficacy of traditional acupuncture for those suffering from chronic neck pain. This was a pilot study, and the study’s objective was to compare the “differences in symptoms, dysfunction, and QOL.” The setting was the Guangdong Provincial Hospital of Chinese Medicine in Guangzhou, China. The participants were patients who utilized an outpatient clinic at the hospital. The inclusion criteria were adults aged 18-60, that had neck pain that exceeded six months, a visual analogue scale score of between 6-7 points, active participation and no treatment using acupuncture within the past six months. Exclusions also included participants who were unwilling to follow protocol and sign informed consent forms and provide their history of

cervical or thoracic trauma. The study design was a randomized, single-blinded clinical trial, with sham control. The intervention of acupuncture and sham acupuncture was 30 - minute sessions three times a week for 18 sessions. There were 190 subjects took part in the pilot study, of which 178 completed. Five of the subjects dropped out because of fear of pain, two of the subjects did not have a convenient appointment time, and another seven dropped out of the control group. The baseline comparison study group  $N= 88$  indicated that 37 (42%) had pain less than five times per month; while the remaining 51 (58%) had pain attacks more than five times per month. In the control group ( $N=90$ ) indicated 34 (37.8%) had pain less than five times per month, while the remainder 56 (62.2%) had pain attacks more than five times per month with a  $P$  of 0.561. The visual analog scale (VAS) in the study group had a mean of 5.30 (SD 1.56), in the control group the mean was 5.49 (SD 1.56). The subjects experienced improved satisfaction in QOL and improved pain outcomes.

Saper et al. (2009) conducted a pilot study among a predominantly minority population, to determine the feasibility of implementing a yoga course of instructions for low-back pain. The participants were a racially diverse group located in two community health centers in Boston, Massachusetts. The pilot was a randomized controlled study conducted over 12 weeks and include the practice of hatha yoga among participants. Study participants were solicited through newspapers, radio, provider offices emails, and recruitment letters. The selected participants were aged between 18-64. There were  $N= 15$  participants as well comparison to  $N=15$  in the control group. The program involved 12 weekly 75-minutes yoga classes. The study outcome was to measure average pain level

using the visual analog pain scale of 0-10 and the 23-item Roland Morris disability questionnaire to validate daily limitations in physical activity due to low-back pain. The yoga teachers and the students were not blinded. The findings included a positive reduction of pain levels in the short term. Albeit, participation for the long term was poor.

In an assessor-blinded pilot study, Yuan and others, (2009) explored the possibility of comparing the frequencies of acupuncture. The authors compared the effectiveness of the acupuncture intervention 2 times a week versus 5 times per week. The University of Ulster clinic in Northern Ireland was the setting for this pilot. The goals of the pilot study were to assess attendance, appropriateness of outcomes and a power analysis using a high frequency group and a low frequency group. The participants were randomly assigned per computer to two groups. Twenty participants were assigned to each group. A blinded investigator measured outcomes through interviews during an initial visit, again at 2 weeks, and finally at 5 weeks. For participants to have relevance in the pilot-study a minimum of four interventions and a maximum of 5 interventions were required. Less than the defined numbers indicated noncompliance. All 30 participants completed the study. The outcome of the study, indicated that the lesser dosing was just as effective as more dosing, a fact the researchers discussed in comparing to those of a previous study. The lack of blinding was a limitation of the study. Further limitations were small sample size and short time frame. The authors felt one of the strengths of the external/internal validity was based on a score of 9 out of 11 on the Van Tulder scale, which assesses the quality of RCTs. The results supported the importance of dosing

frequency and suggested further studies should be conducted comparing the effects of difference frequencies of treatment.

### **Literature Appraisal**

**Level I.** Yoga is described as an intervention that is dependent upon patient self-report and cannot be blinded (Cramer et al. 2013). Cramer et al. (2013) focused a systematic literature review and meta-analysis of the application of the yoga intervention for low-back pain. It was clearly elucidated that most of the evidence in this review was of a good quality. The studies included RCTs that were published. There were 10 RCTs which included 967 participants in the study. Nine of the 10 studies dealt specifically with low-back pain. The intervention varied from daily 7 days a week or twice weekly for 24 weeks. Bias was assessed by 2 reviewers using the specifications as outlined by the Cochrane Back Review Group. A third reviewer was used to resolve disagreements. The systematic review presented significant evidence there was a little bias in 8 studies, whereas two trials had a high risk of bias. Findings: yoga did reduce pain but did not improve QOL of patients.

A study by Hinman et al. (2014) attempted to determine the benefit of laser and needle acupuncture. This study was conducted in several areas in Australia. Recruitment was done through the media, the community, and via physical therapy clinics. The intervention of the study was laser and needle acupuncture with sham acupuncture and a control group. A Zelen-design was used which required randomization before informed consent. The researchers did discuss the possibility that the Zelen-design maybe considered unethical. Ethical approval required that there was prior disclosure at

enrollment of deidentified data. However, the researchers believed the Zelen-design was a strength of the study. The primary outcome measures included a numeric rating scale of 0-10; a minimal clinical importance difference (MCID), and physical function. Alternate outcome measures included QOL, global change, and other pain outcome measures. The researchers utilized an intent-to-treat analysis. The population consisted of patients 50 and over with pain that varied from chronic, moderate to severe pain. Patients finished questionnaires at baseline three months and down the line, and at one year were randomized to one of four groups, control, sham, needle, and laser acupuncture. The control group continued as participants in the observational study and did not know they were in an acupuncture study. The patients received acupuncture by needle and the acupuncturist was not blinded. Seventy-one participants who were randomized did not receive any acupuncture (the control group), 70 participants were randomized to receive the intervention acupuncture by needle; 71 participants were randomized to undergo laser acupuncture and 70 participants were randomized to undergo sham laser acupuncture. There were a few mild adverse reactions. Laser and needle acupuncture were not more effective than sham acupuncture for pain. There is insufficient evidence to support the use of acupuncture for those over 50 years of age.

Fouladbakhsh (2012) conducted an extensive literature review of secondary modalities to relieve the pain of osteoarthritis. The review of the literature was from late 2010 and early 2011 and covered a 10-year period. The review was conducted via multiple evidence-based resources. The author covered multiple modalities: however, for the purpose of this systematic review, only the comments regarding yoga, tai chi,

acupuncture, and massage was discussed. Although yoga is widely practiced, there is limited research on its effect on osteoarthritis. Individuals practice various styles of yoga that may offer different outcomes. There are various styles of yoga that individuals practice which may offer different outcomes. For example, Iyengar yoga uses various supportive props and is noted for its success in reducing pain. Fouladbakhsh (2012) has indicated that yoga intervention does improve the QOL of patients. However, Fouladbakhsh (2012) further states that the use of a yoga intervention in osteoarthritis requires further research and evidence. Another mind and body therapy is tai chi, which is also rooted in Chinese medicine. Additionally, while there is moderate evidence to substantiate the use of ta chi in osteoarthritis, further research has been recommended to determine protocols for various demographics such as ethnicity and age. Acupuncture is an energy therapy also rooted in Chinese medicine. Unlike yoga and ta chi, acupuncture has been scrutinized through various demanding randomized control trials. Thus, acupuncture is recommended for use in osteoarthritis as it does improve pain and QOL. Massage therapy is described as a body-based manipulative therapy. It is only recommended for low-back pain.

I briefly discussed a systematic review process described by Jonas (2014), This systematic review is recognized as the rapid evidence assessment of the literature (REAL). The REAL was developed by the Samueli Institute, Alexandria, Virginia, United States and the United States Army Medical Research and Material Command. The REAL uses a panel of experts to make evidence-based recommendations. There is a disclaimer that states the recommendations are solely those of the author of the

systematic review. Based on the results of an extensive review there are weak recommendations conducive to massage therapy, music therapy, and tai chi. Based on the results of this systematic review, Jonas (2014) found that quality evidence-based studies are needed to identify effective nonpharmacological methods to be used in active, self-care, as well as complementary, and integrative medicine therapies ACT-CIM.

Knoerl, Smith, and Weisberg (2016) conducted an integrated review from 2009-2015 on chronic pain and CBT. The review included 35 studies. Knoerl et al., (2016) discussed the implications of chronic pain on individuals and how it impacts their QOL, in terms of sleep disturbance, anxiety and depression. The authors found that the chronic pain treatment is difficult with the various comorbidities. CBT is an intervention that is applied in an individual or group setting. Knoerl et al. (2016) presented tables for review. Table 1 included population, intervention, and outcome as well as significant results on CBT clinical trials between 2009 and 2015; Table 2 included CBT intervention characteristics. This table included intervention dosing frequency, the positive effects on pain intensity evaluated in percentage terms, and the positive effects on IMMPACT/primary outcomes percentages. The authors cited limitations such as a lack of team effort in critically appraising the articles included in the study. Only the primary author reviewed the content. In conclusion, it was determined that in 43% of trials CBT was an effective treatment for pain intensity and variables.

Lauche et al. (2016) directed an RCT comparing a three armed-parallel group trial: There was a comparison of no treatment, tai chi, and no conventional neck exercises. The subjects were selected through an advertisement recruiting participants in

a local newspaper in Essen, Germany. In Germany, the study not blinded as it was by most CAM practices for that country. The intervention, tai chi, was offered once a week for 12 weeks. The sessions were 75-90 minutes. Questionnaires were utilized to consider, the intervention, yoga on chronic pain and the patient QOL. Questionnaires in the study were from the HRQOL Short Form. The study was based in Germany, and some of the scales used were based on the German version of the scales. The primary outcomes were pain analysis and the finding that there was a variance among the wait list control group and the tai chi group after 12 weeks. In comparison, the tai chi group and the regular exercise group did not demonstrate any preference of one modality over the other. After 24 weeks, there was no change between the wait-list control group and the tai chi group regarding the intensity of pain. There was satisfaction for both the regular exercise group and the tai chi group. Tai chi is effective for pain relief and the QOL. The same can be said for the regular exercise group.

Lee, Crawford, and Hickey (2014) conducted a systematic review using the Samuelli Institute's method to appraise the quality, self-efficacy, and effectiveness of complementary medical practices. A total of 146 randomized control studies were included in the review. There were 54 studies that were specific to mind-body. The search strategy was to convene a panel of experts ( $N=9$ ) that evaluated the 146 articles. The articles focused on RCTs of mind and body therapies. The articles were evaluated using the Scottish Intercollegiate Guidelines Network checklist. The group met for one day to discuss the review result and grade analysis. The results were consistent across

studies in that the group gave a weak recommendation for the use of these therapies because of the low quality of the studies.

Lee and Schoomaker (2014) were an expert team that utilized a systematic review using the Samueli Institute's REAL methodology to appraise the quality, efficacy, and safety of yoga and tai chi. The authors describe yoga and tai chi as movement therapies. The complexity of chronic pain is shifting from a symptom of disease to a disease process that may involve cognitive, emotional and pathological processes. The ACT - CIM incorporates complementary and alternative methods with conventional medicine. This is more like holistic medicine, which treats the whole individual. The literature review covered 146 RCTs of which 30 were related to the movement therapies. Yoga was included in 13 studies:  $N=2$  of the studies were of the highest quality and proposed that dosing should be done 15 hours per week to be adequate in pain reduction. Seven of the 13 studies were of high quality, with dosing varying from 15 hours. Tai chi was involved in 10 of studies under review. Three high quality studies reported dosing 24 hours during a 12 week period and 36 during a 12 week period and two had a dosing for 36 hours over 24 weeks. Five studies were of poor quality. It is noted that tai chi was perceived as safe; however, it is associated with mild musculoskeletal events. With yoga, there is a low prevalence of adverse events with a high prevalence of use. It is important to have trained instructors with appropriate credentials to work with patients. Yoga and tai chi are weakly recommended as interventions in treating chronic pain.

The aim of the literature review by Park and Hughes (2012) was to identify the benefits of nonpharmacological methods in an older population. The review consisted of

28 RCTs that could be used in this study. There were 18 physical interventions and 10 psychological interventions. The group identified their data sources and search strategy. They searched CINAHL, MEDLINE, and PsychINFO. Adults 65 and over who lived in communities and did not have cancer pain were included in the review. The findings were that nonpharmacological interventions might be appropriate, but there is no indication of proven benefits. Included in the review were acupuncture, music, Qigong therapy, psychosocial intervention, CBT, mindfulness meditation, and guided imagery.

This abstract review is a systematic review by Monticone et al., (2015) I was unable to retrieve the full article from the Cochrane Data Base of Systematic Reviews. The intent of the systematic review was to appraise the effect of CBT on persons with chronic neck pain. The study was randomized and consisted of three comparisons, CBT as compared to the use of a placebo intervention, no therapy wait list control, CBT versus other therapeutic modalities, and CBT in combination with other interventions. There were 10 trials that were randomized with 836 participants. The bias of the studies ranged from low risk (40%) to high risk (60%). The quality of evidence supporting the use of CBT ranged from low to moderate. No measured quality benefit was presented that CBT was better than no other intervention for pain management. The standard mean difference was (SMD)-0.58, with a 95% confidence interval of -1.01 to -0.16, and QOL (SMD -0.93, 95% CI -1.54 to -0.31) in the short term. Besides, there was some low-quality evidence that cognitive behavioral therapy CBT and showed moderate benefit in pain reduction in short-term investigation (SMD-0.24, 95% CI -0.48 to 0.00). CBT is effective on a short-term basis as compared to no intervention.

In this systematic review of alternative clinical interventions, spinal manipulation therapy (SMT), herbal medicine, and the intervention acupuncture were assessed for their effectiveness in the treating low back pain (Rubinstein, et al., 2010). The search conducted by a librarian was for RCTs that had at least one conclusion that was measurable: pain, QOL, and functional status. The studies had to specifically address at least one of three interventions, SMT, acupuncture and herbal medicine. Multimodal studies were excluded because it would be difficult to discern the outcome of a particular-intervention. The selected criteria were adults (18 years and older) and, RCT with at least one day follow-up. Some studies were excluded if the patient had radiculopathies, electro-diagnosis, neurological deficits, or low-back pain related to pregnancy. There were some exclusions, including but not limited to post-surgical pain, secondary studies, abstracts, or unpublished studies. Two reviewers appraised the literature independently, and a third reviewer was used if there was not an agreement. The intervention acupuncture was compared to no treatment, sham, and another intervention such as exercise. This review considered the results for acupuncture. The effect size calculations were weighed used the “mean weighted difference” (MWD) for pain. The scales were manipulated to use 100 points, as needed to demonstrate acceptable results. For the most part, a visual analog scale (VAS) or numerical scale were used to measure pain. There was one exception, in which an acupuncture study utilized the Korff Chronic Pain Grade Scale. For each intervention, a 95% confidence interval was calculated. A total of 35 RCTs were included. Acupuncture comprised 20 of the 35 RCTs. There was a low risk of bias in eight studies. Two of the acupuncture studies had what was described as “fatal

flaws,” while 18 of the studies did not have “fatal flaws.” These 18 studies assessed the impact of acupuncture versus control, acupuncture compared to another intervention, or the intervention alone. It was reported that acupuncture provided a short-term relief and was clinically effective compared to controls or with the addition of a second intervention.

Chronic neck pain is a major global problem. San-Dol (2016) conducted a study to determine the effectiveness of the intervention yoga in managing chronic neck pain. This systematic review covers three trials. The inclusion criteria included neck intensity of 40mm-100mm on a VAS. Yoga was the intervention, and the measures were chronic pain, and functional disability. The sample size of all the studies was  $N=182$ . The researcher stated that the sample was too small to do a meta-analysis and the studies were of low quality. The sample size was small, and the poor quality of the studies, made it difficult to determine the benefit of yoga in managing chronic neck pain.

This review was conducted as a methodology to synthesize data on the efficacy of CAM as an intervention for chronic pain (Tan, et al., 2007). While it is plausible this is a systematic review; the authors did not list it as such. By the classification, it is listed as the opinions of authorities and expert committees. There were multiple VA facilities and public sector facilities involved. The studies reviewed covers numerous applications of CAMs from 1966 to July 2006. The author's purpose was to synthesize data on the efficacy of CAM. Patients with noncancer pain and acute pain were excluded from the studies. The key outcomes included disability and acute pain. The studies included RCTs and meta-analysis, which covered a vast number of CAM practices. In their analysis, the

reviewers found it was difficult to evaluate the quality of the studies because of their rating systems, which were difficult to compare. Because the review parsed out the CAMs, only the CAMs relevant to this paper were discussed. The team used an efficacy scale by the clinical psychology division of the American Psychological Association. There are five levels on the scale: Level 1: Not empirically supported and the studies are not verifiable; Level II: Possibly efficacious; are those interventions that are non-randomized with outcome measures; Level III: Probably efficacious; those interventions are replicable in multiple studies with favorable results; Level IV: Efficacious; interventions that have comparisons regarding treatment, to other studies with valid statistics; and Level V: Efficacious and specific; those studies that are scientifically supported and superior to sham therapy. (Tan et al., 2007). Massage therapy in the abovementioned studies received an efficacious rating for low back pain whereas, acupuncture and yoga both received a probably efficacious rating for low back pain.

Xu et al. (2013) found many studies that tout the benefits of acupuncture intervention, but that it is difficult to replicate those studies because of the sample size and methodology employed. In a meta-analysis of 13 RCTS, Xu (2013, p 2) raised the “null hypothesis that acupuncture is equally as effective as blank treatments, sham acupuncture, or conventional care as well as other alternative therapies.” The meta-analysis included 13 RCTs with 2678 patients. The search strategy included two independent reviewers who searched the literature for RCTs to review. This search included RCTs with primary outcome measures for pain and clinical outcomes such as QOL and disability. Some of the things the metaanalysis team considered were the

rationale of the acupuncture intervention, the style of acupuncture, the details of needling, dosing regimen, details of treatment, details of the setting, practitioner background, control, and comparable interventions. In addition, the article discussed the parameters assessing of the RCTs. There was also an appraisal of each article that specifically assessed items such as adequacy of randomization whether the allocation of treatment was concealed. Internal validity was specific to identify characteristics of biases in selection, performance, attrition, and detection. The outcome indicated that the acupuncture intervention compared to no intervention was effective in relieving pain. Acupuncture effects could be related to the effects of manipulation of the skin. Xu et al., recommended the use of the intervention acupuncture in combination with other interventions. The limitations encountered were “relatively finite outcome variables.” In addition, other types of interventions included in the analysis were heterogenous. Based on these findings, acupuncture is effective for the long-term abatement of long-standing back pain however, such relief believed to be related to skin manipulation.

China has integrated conventional and national medical systems (Zhang, Kong, Zhang, & Li, 2012). Zhang et al. (2012) carried out a systematic review of the literature to assess TCM interventions on HRQOL of patients. In addition, the team assessed the cost effectiveness of using TCM. Their research yielded 164 original articles. Many articles did not meet the inclusion criteria. Forty-one of the articles did meet the criteria, but an additional 11 were excluded because they did not include TCM research or HRQOL. In the end 31 of the articles did meet the HRQOL requirement. Zhang et al., (2012) indicated that there was need for further research of HRQOL and cost

effectiveness because of the “vague and uncertain standard of evaluation efficiency” (p.1118).

**Level II.** Pilot and Beck (2008) have described Level 2 as a single randomized control and non RCTs. Telemedicine is one wave of the future in medicine. In a study by Carmody et al. (2013, p.265) at the VA Medical Center in San Francisco, California, conducted a randomized trial involving “telephone -delivered CBT for pain management among older military veterans.” The authors stated that approximately 50% of veterans seen in primary care in the Veterans Health Administrations suffered from disabling chronic pain. Many of these veterans were older, as much of the research was completed on younger veterans. Some of the older veterans traveled long distances by car to reach the VA treatment facilities. These long distances were prohibitive for these veterans in terms of receiving rehabilitative care. The aim of the study by Carmody et al., (2013) was to investigate the efficacy of care delivery via telephone. The intervention in this randomized trial was CBT. The secondary design of the study was to identify the roles of the variables “coping self- statements and catastrophizing” in treatment plans. In previous research, self-efficacy has been associated with improvements in pain (Carmody et al., 2013). The study design was a randomized trial that compared telephonic pain education and telephone-delivered cognitive behavioral therapy (TDCBT). Participants recruited for the study were veterans 55 years old or older who had enrolled in the VA Healthcare System’s primary healthcare clinics and was diagnosed with chronic pain and had telephone access. The study was advertised in local VA facilities. One hundred and one patients out of that agreed and were eligible to participant out of 171 patients who

completed the questionnaires and met eligibility requirements to participate in the study, but 46 of those eligible declined to participate. There were 147 eligible patients, however, 46 were eligible, but declined to participate. The patients were randomized, but three patients of those randomized declined treatment. Training assessment technicians were educated on the procedures used and, the assessment remained blinded until the trial had been completed. The intervention of TDCBT included 12 sessions that was delivered over 20 weeks. The telephone -delivered education was also included 12 sessions delivered over 20 weeks. The mean age for the education group was 69, and that of the CBT group was 66. The participants in the education group completed 9.4 sessions and those in the CBT group completed 9.5 sessions. The results indicated that TDCBT was not more effective than telephonic pain education. However, pain intensity was reduced in both groups.

Little et al. (2016) conducted a factorial RCT of the Alexander Technique Lessons (ATLS), and the utilization of massage for chronic pain management. Participants recruited for the study were veterans 55 years old or older who had enrolled in the VA Healthcare System's primary healthcare clinics and was diagnosed with chronic pain and had telephone access. The Factorial trial allows the researchers to evaluate more than one intervention. In this study, the researchers recruited 64 general practitioners from south, and west England. The practitioners provided patients who were submitted to randomization. It was difficult to determine whether subjects and providers were blinded to the process. A total of 579 patients completed the questionnaire, were randomized. At three months, 469 patients completed the questionnaire, and at 12 months

463 patients completed the questionnaire. There were 144 patients assigned to the control group and 147 to the massage group. In addition, in the ATLS group, 144 patients were assigned to six ATLS, and 144 were assigned to 24 ATLS. The results indicated that massage therapy provided short-term benefits, however, benefits were not significant in the long term.

The aim of this research study was the results of acupuncture used to treat chronic pain in four primary care centers in Bronx, New York. The population consisted of an underserved minority population of 29% to 69% black, and 23% to 58% Hispanic (McKee et al., 2013). The outcome measure was to describe the Acupuncture to Decrease Disparities in Outcomes of Pain Treatment (ADDOPT) trial. The goal was to introduce acupuncture to a diverse, low-income community. The primary care clinics were part of the New York City Research and Improvement Networking Group. The focus of this group is to decrease healthcare disparities in an urban setting. The staff received 60 minutes of education on the ADDOPT study to include acupuncture processes. The design selected was a repeated-measures quasi-experimental design. This design was selected because it allowed participants to have numerous measures before and after the intervention. This design allowed for the intervention to be offered to all patients who met the criteria. The intervention consisted of 14 weekly sessions administered by third year acupuncturist supervised by a licensed acupuncturist. Patients were evaluated medically by the acupuncturist. The data collection included calls to the patients every two weeks. Using these two-weeks calls or in-person visits provided information on the participants' functional status. Pain was examined using the Brief Pain Inventory (BPI)

and the Chronic Pain Grading Scale. A change in the BPI of 30% is significant. The SF-12 was used to assess the eight measurements of physical and mental HRQOL. The study confirmed that of the 495 patients referred, 291 were confirmed eligible for participation. In the end, 228 of the patients started the acupuncture intervention. The patients had an average age of 54.3 years. The BPI indicated pain severity before baseline at six weeks to be 6.9 (6.6-7.1) pain severity, and pain interference 6.9 (6.6- 7.3). At baseline, pain severity was 6.7(6.5-7) and pain interference was 6.4(6-6-6.8). On follow-up at 24 weeks, pain intensity was 5.5(4.9-6.1) pain interference was 5.0(4.4-5.7) The characteristics of pain intensity at baseline were 8.6, (76.8-80,3) at baseline and 64.7(59.9-69.5) at 24 weeks. The BPI Pain severity treatment period had an estimate of -0.71, CI -0.40, -1.03 and a *P* value of <.001, and a post treatment estimate of 0.41, CI, 0.77, -0.04, with a *P* value of .117. Limitations of the study were the design, and turnover of clinicians. There were notable improvements in the patients' QOL and chronic pain.

The United Kingdom primary care was the setting for a three-pronged RCT to evaluate (ATLAS) or acupuncture for patients with long standing neck pain (MacPherson, et al., 2015). The interventions consisted of 12 acupuncture sessions and 20 one-on-one Alexanders Technique lessons for a total of 300 minutes for each intervention. The trial design was described as the ATLAS. The participants in the study were included because of chronic pain, and were assigned to three groups: Acupuncture, Alexander technique lessons or no treatment. There were 33 practices involved in the trial. Between March 2012 and March 2013, 517 patients were recruited. After randomization, eight patients were excluded because of a Northwick Pain Questionnaire

(NPQ) score of less than 28. There were 36 acupuncturists involved with 18 on each team. The NPQ score for acupuncture was reduced by 31% percent from baseline. There is substantial evidence that acupuncture as an intervention is beneficial in relative long-term reduction in pain. A limitation was that the study was specific to a small area in the United Kingdom.

Teut, Krill, Daus, Roll, and Witt (2016) conducted a RCT of older adults. The study was three armed with Qigong, yoga, and no intervention. The study was conducted in Berlin, Germany. The participants were recruited through newspapers, brochures, handouts, and information sheets presented to nursing home residents. The randomization was carried out by using the RANUNI function of SAS software. There were 369 interested participants, of whom 118 did not meet the inclusion criteria. One-hundred-and-seventy-seven patients attended the admission interview one patient did not meet the criteria, 178 participants were randomized. There were 61 participants in the yoga group, 58 participants in the Qigong group and 57 in the control group. The average age was 73.0 for yoga, 72.4 for Qigong and 72.6 for the control group. The yoga participants received 24 classes, and the Qigong participants received 12 classes over 3 months. To determine a pain intensity rating the researchers used a scale with 5 levels of intensity. There were no significant changes in pain intensity, or QOL among seniors.

Weib et al. (2013, p. 935) conducted an RCT on the “effectiveness and acceptance of acupuncture in patients with chronic low-back pain.” Patients were randomized and assigned to group Group A, and Group B in a rehabilitation clinic as per German guidelines. A total of 174 patients participated in this study. The objective was to

determine the effectiveness of additional acupuncture treatments, which was accepted by the participants. The study was based on German guidelines, which adds relevance to the current systematic review. Group A was the intervention group while B was the control group. Both groups underwent a 21-day inpatient rehabilitation. In addition, group A, the intervention group, received acupuncture sessions twice a week from 2 trained Chinese physicians in traditional Chinese medicine. The patients were given questionnaires to answer before initiation of the program, and when the program was completed, and 3 months post completion. The questionnaire contained questions about HRQOL, sociodemographic information, and how the patient felt toward Chinese traditional medicine. The questionnaire also included questions relating to how well the patients' QOL, was and the intensity, and duration of adverse events. The group used descriptive statistical analysis with standard deviation and frequency. The researchers indicated that the study analysis should be interpreted as an exploratory study. In the end, four patients were excluded, seven declined to participate, 3 patients had language issues, and 13 discontinued the study. Of the 143 participants. 74 were assigned to Group A and 69 were assign to group B. The study revealed that acupuncture was an effective intervention.

**Level VI.** Level V1 included single descriptive and qualitative studies (Polit and Beck, 2008). There is a paucity of knowledge about what a patient expects from treatment outcomes from using CAM for long standing low back pain (Hsu et al., 2014). Using a qualitative study Hsu et al. (2014) tried to ascertain patients' perspectives on outcome expectations. The study was conducted in Seattle, Washington, and Tucson,

Arizona. Little is known about what patients expect before they start CAM, and there is no standard method for assessing patients' expectations in this regard. Thus, the objective of this qualitative study portrayed an attempt to parse out insights into patient expectations. The goal was to collect information and deduce from that information patient expectations as they relate to CAM therapy. Hsu et al. (2014) focused on 4 CAM techniques: yoga, acupuncture, massage, and chiropractic. A questionnaire was developed to measure treatment expectations of those experiencing low back pain. The method used included interviews with 64 subjects (48 women and 16 men) from January through September 2011. There was a staggered enrollment process, with 24 patients enrolled prior to their first intervention. The second group was enrolled shortly after the intervention. The third group of 20 patients were enrolled after several months of the intervention. Various techniques were employed to solicit study participants from advertisements online, CAM providers, and research websites. A 0-10 pain scale was used to rate pain interference with the activities of daily living. Three interviews were scheduled for the first 24 study participants; 2 interviews were scheduled for the second 20 study participants; and 1 interview was scheduled for the last 20 study participants. Two interviewers analyzed transcripts while a third interviewer using the "immersion/crystallization approach." The results through analysis meant that words such as "expect and expectation" had various meanings, dependent upon the contextual usage. In hope versus expectations, one patient stated "I am hoping that long term this will lessen my pain and give me a better QOL. That's what I'm hoping for. But I'm not going in with an expectation that this is what's going to happen (Hsu, et al., 2014, p. 4)." On the

other hand, some participants had no expectations. The group came up with the following key domains: pain function, physical fitness, mood, and QOL. The findings in this qualitative study contributed to the body of knowledge on patient expectations and outcomes.

### **Synthesis**

Table 3 presents the synthesis. The synthesis table includes the study, intervention, and outcome. The purpose of the table is to compare the studies and determine how they are alike, or different.

Table 3

*Synthesis Table*

Study	Study design	Intervention	Outcome
Abdulla, 2013	SR—British Pain & British Geriatric Society—I	Y	Lack of evidence in an older population.
Brosseau, 2012	SR—Ottawa Panel—I	MT	Effective intervention to reduce CLBP. Need further research for dosing.
Carmody, 2013	SR—I	CBT	Sig. improvement.
Chou & Huffiman, 2007	SR/panel of experts—I	AC, MT, CBT	CBT only therapy with good evidence. Insufficient evidence for MT. No recommendation for AC.
Chou et al., 2007	SR/panel of experts—I	Y, AC, MT, CBT	Y, AC, & MT moderately effective evidence; weak recommendation.
Cramer & Lauche, 2013	SR/MA—I	Y	Short-term effectiveness of CLBP; lack of evidence that Y is more beneficial than exercise or usual care.
Fletcher, 2016	MM—Pilot	MT	Pilot study.
Fouladbakhsh, 2012	ROL—VII	Y, TC, AC, MT	Zero recommendations.
Groessel, 2008	PPD—IV	Y	Y intervention may help VA patients.
Groessel et al., 2012	PPD—IV	Y	Need more study for the health benefits of Y.
Hassett, 2011	ROL—I	CBT & Y	CBT recommendation, weak recommendation for Y.
Hinman et al., 2014	Zelen design—II	AC	Found that treatment better than sham.

Study	Study design	Intervention	Outcome
Hsu et al., 2014	QSI—VI	Y, AC, MT	Outcome treatment clusters pain relief and QOL.
Jonas, 2014	REAL methodology with panel of experts—I	Y, AC, MUT	Weak recommendation for TC, MUT, and Y.
Knoerl & Smith, 2016	Integrated review—I	CBT	Effective in reducing pain and improving QOL in 43% of trials. More information is needed for dosing.
Lauche, 2016	RCT D—three-armed parallel group—II	TC	Outcome: More beneficial than null intervention in improving pain and QOL.
Lee, Crawford, & Hickey, 2014	SR, using the REAL methodology with expert panel—I	TC & Y	Unable to make recommendation for any of the mind-body therapies.
Lee & Shoomaker, 2014	SR using the REAL methodology with expert panel—I	TC, Y	Outcome: TC and Y weak recommendations for LBP.
Liang, Zhu, Fu, & Yu, 2009	Two-armed RCT & single-blinded clinical trial	AC	Pilot study.
Little et al., 2008	Factorial RCT—II	MT	Outcome: MT effective in short term. Improved QOL.
MacPherson et al., 2013	Three-group RCT—II	AC	Outcome: Significant reduction in chronic pain.
McKee et al., 2013	Repeated measures Q trial—II	AC	Short- term improvement in QOL.
Mehl-Madonna et al., 2016	Pain education program integration—IV	Y, TC	Pain education caused a decrease in the use of opiates, decrease in pain level based on the visual analogue.

Study	Study design	Intervention	Outcome
Monticone et al., 2015	SR—I	CBT	Low quality for improving pain and improving QOL.
NGC, 2016	SR/evidence-based working group—I	CAM	CPGs for VA and DoD. These guidelines mostly address medical management. Did not consider CBT. In addition, the group found that the other CAMs were of poor quality.
Park & Hughes, 2012	ROL—I	AC, CBT, MUT	For older patients, AC and CBT may be beneficial for CLBP. MUT may also be beneficial.
Rubinstein, et al., 2016	SR—I	AC	Low-quality evidence.
San-Dol, 2016	SR—I	Y	May be beneficial, only three trials; related to neck pain.
Saper et al., 2009	RCT LR—II	Y	Pilot study.
Tan et al., 2007	I	MT, AC, Y	MT, AC, and Y are beneficial.
Teut et al., 2016	3-armed RCTs—II		
Webster & Markham, 2014	LR—VII	Y, CBT, AC	None listed.
Weib, 2013	Random group assignment—II	AC	Recommended for inclusion in rehab unit.
Xu et al., 2013	Meta-analysis—I	AC	Current data indicated to be effective for long-term CLBP; attributed to skin manipulation.
Yuan et al., 2009	RCT pilot study	AC	Pilot study.
Zhang et al., 2012	Structured literature search—I	TC	Vague standards relative.

*Note.* AC = acupuncture, CBT = cognitive behavioral therapy, CLBP = chronic low back pain, CPGs = clinical practice guidelines, MA = meta-analysis, MT = massage therapy, MUT = music therapy, NP = nonpharmacological, Q = quasi-experimental, QOL = quality of life, RCT = randomized controlled trial, ROL = review of literature. SR = systematic review TC = tai chi, Y = yoga, SR = systematic review

I expected to learn that there was much evidence that supported the independent variables: music therapy, massage therapy, acupuncture, cognitive behavioral therapy, and tai chi. The level of evidence and quality of evidence indicated the variables' level of strength. The comparison of studies were conducted to ascertain what is being done in the context of nonpharmacological methods used to treat chronic pain, but the wide variations in the simple technique of establishing pain level made this comparison difficult. In some studies, the visual analog scale was 0-10, whereas in other studies it was 0-100; in some cases, totally different processes were used to assess the dependent variable of pain. In addition, QOL was not discussed in many of the studies. The lack of standardization made the appraisal a challenging process to appraise. However, evaluation and synthesis table helped this process and contributed to the interpretation of the results.

In this synthesis review, 36 articles met the inclusion criteria. Of the 36, there were four pilot studies. People practice CAM regularly without scientific evidence to support such practices. The complementary studies for this systematic review are CBT, massage therapy, yoga, acupuncture, tai chi, and music therapy.

While many of the articles discussed multiple CAMs strategies, some studied only one. To have a clearer understanding of how each article was relevant to my systematic review, I looked at similarities and differences with the design, interventions, and outcomes of CAM treatment. For example, in some clinical practice guidelines, the reviewers used the approach of having a panel of experts that appraised the literature for evidence. This approach was used in studies by Jonas, (2014), Chou and Huffman,

(2007), Chou et al., (2007). Also, a study by the Veterans Administration and Department of Defense used diverse panels that are described as evidence-based working group. It was interesting that these evidence-based working groups did not recommend any of the CAM strategies because there was a paucity of acceptable evidence to support the use of CAM strategies in osteoarthritis. The VA and DoD group specifically mentioned that it did not consider CBT. A study by Chou and Huffman (2007) found that CBT was beneficial in the treatment of CLBP. In a study by Chou et al., (2007) found that CBT was not as effective for CLBP. The review Chou et al. (2007) which was corroborated by Hassett and Williams, (2011) suggest that the use of CAM is not meant to replace medical therapies but to augment them. In collaborative or integrative practices the ability to provide diverse methods for pain management is crucial for achieving successful outcomes in treating those suffering from chronic pain. According to Webster and Markham (2014), while CBT offers moderate benefits, Webster and Markham (2014) is good with moderate benefit, however, Webster and Markham (2014), did not recommend using CAM. Their focus was on the medical management of chronic pain using a personalized medical and integrative approach.

Yoga is a very popular CAM practice used today to help manage chronic pain, and there are many studies on yoga as a practice. Grossel et al., (2007, 2014) in 2 studies did not recommend yoga as a practice to prevent chronic pain in 2 studies despite the fact, that it has been offered at the VA in San Diego since 2003. Several studies addressed the relationship between QOL and chronic pain (Cramer, Lauche, Haller, & Dobos. 2013; Fouladbakhsh, 2012; Lauche et al., 2016; McKee, et al., 2013; Rubinstein

et al., 2010; and Teut et al., 2016). Interestingly Cramer et al. (2013a) found that yoga increased in QOL and decreased pain. Teut et al. (2016) found it was difficult to evaluate studies because of the different rating systems for pain, but concluded that yoga's effect on pain relief and QOL was poor. Much of the disparity in ratings is related to how various studies rate pain. For example, Rubinstein et al. (2010), used a 100- point scale, while Sang Dol (2016) used a rating scale that ranged from 40-100 mg on a visual analogue scale. Rubinstein et al (2010), Teut et al, (2016), and Groessl et al. (2007, 2012) used what is called a "pain severity scale" to rate pain level. Suffice it to say there are multiple implications associated with how studies are conducted and rated to provide meaningful results. Finally, in working with veterans, it is important to include all adults ages 18 and above. Park and Hughes (2012) acupuncture and CBT maybe effective in relieving chronic pain in those over 65. Abdulla et al. (2013) suggested that CBT may benefit those in rehabilitation facilities, while Carmody (2013) pointed out that acupuncture was no more beneficial in relieving chronic pain than sham acupuncture. However, one study found acupuncture was effective in relieving pain because of skin manipulation (Xu et al., 2013). There is little evidence that music therapy works for treating chronic pain (Park & Hughes, 2012) and Jonas (2014) gives it a weak recommendation. Massage therapy has been found to benefit those suffering long standing low back pain (Brosseau, et al., 2012). In other studies, massage therapy was no more beneficial than regular exercise. It is evident that there is not a clear and consistent recommendation from many of the appraisals on both, pain and on the effect of pain on the patient's QOL. There were 6 reviews that addressed pain and QOL as outcomes

(Cramer, 2013; Fouladbakhsh, 2012; Knoerl, 2016; Lauche, 2016; and McKee, 2013; ).

Some studies have recommended tai chi and yoga as having a moderate effect on chronic pain, whereas, massage therapy, acupuncture, and CBT have been highly recommended.

Findings indicate there is insufficient evidence to suggest music therapy is effective.

### **Implications**

Clinicians play an important role in making recommendations for patient care, but it is vital that patients are involved in making healthcare decisions regarding their care. In this systematic review, many of the studies were based on different designs and locations, with varying outcomes that may or may not have provided significant results. For example, Cramer et al. (2013) in their systematic literature review and meta-analysis found that yoga relieved CLBP, but did not increase the patient's QOL. Clinicians should consider adopting a multicomponent approach to patient care, combining nonpharmacological methods with traditional medicine. (Hassett & Williams, 2011; McKee, 2013; Xu et al., 2013). A positive spinoff to adding nonpharmacological methods to traditional medicine could be the reduction in the amount of medication required. This is particularly true for those over the age of 65 who are on multiple medications which may have side effects. While the VA did not make any recommendations for any of the nonpharmacological approaches, the working group did recommend that patients be given a choice. It is important that studies use common designs and methods so that comparing and contrasting findings are easier.

### **Strengths and Limitations**

The strength of the systematic review is the rigorous process undertaken to answer the question: What is the level of quality among the nonpharmacological methods used to manage chronic pain and to what extent has the literature addressed this subject and offered practical guidelines? The limitations included the possibility of bias because I was the sole appraiser of the articles and practice guidelines.

### **Summary**

Through this systematic review, I attempted to answer the question about the level of quality of nonpharmacological methods used to treat chronic pain available from chronic practice guidelines and articles. In this process, this study has

- Analyzed CPGs and articles that focus on reducing chronic pain using nonpharmacological chronic pain methods of treatment
- Established the quality of clinical practice guidelines and articles dealing with the nonpharmacological treatment of using the Rapid Clinical Appraisal checklist, and evaluation and synthesis tables (Melnyk & Overholt, 2011).
- Made recommendations on the level of quality of clinical practice guidelines and articles that related to non-pharmacological interventions for chronic pain in clinical practice.

Evidence-based practice supports the following non-pharmacological interventions based on the level of quality of clinical practice guidelines and evidence-based articles: massage therapy, acupuncture, CBT, and yoga. Tai chi and music therapy were not recommended based upon appraisal of nonpharmacological CPG and articles.

As with any recommendations, the clinician should use the recommendations only as a guide. All patients respond differently to various treatment methodologies.

## Section 5: Dissemination Plan

The goal of this systematic review is to disseminate the findings through blogging. As a postgraduate student, I plan to build a blog, the content of which will consist primarily of material addressing nonpharmacological methods of chronic pain management. My intention is not to replace medical management, but to provide veterans with choices through which they can augment current treatment plans in a collaborative or integrative manner. My blogging is a full-time process in which I continually update myself as a scholar. I plan to set up the blog using a domain name and I have yet to decide where I want to host my blog. As I want control of my blog, I will pay for webhosting.

As a scholar, I have learned that patience, perseverance, and faith are characteristics that are important to my success. Patience has helped me to weather times when things did not go as I thought they should. Perseverance provided me with the stamina to move forward. Faith is what guided me when I was hesitant in moving forward.

I continue to investigate ways of implementing a blog and will take the following steps to develop a blog, as recommended by Blog Builders (2016):

- Develop a brand.
- Select a web host that provides service 24/7.
- Select a platform (WordPress.org).
- Learn the ropes of how to use my blog.
- Make the blog design attractive to attract visitors.

- Consider the blog's organization to make the blog easy to use.
- Arrange configurations properly by logging into the dashboard and establishing settings so that other bloggers can see the blog, thereby increasing traffic to the site.
- Use plugins that are conducive to productivity and allow customization of the blog for functions such as connecting to social media, providing contact information, and controlling spam.

### **Summary**

I have reviewed multiple blogging sites to gain ideas concerning how to organize my blog. I believe that I have the knowledge to discuss nonpharmacological pain methods and how they impact the lives of patients, particularly veterans. I believe that this endeavor is an opportunity to continue to learn and provide a valued service to my community.

## References

- Abdulla, A., Adams, N., Bone, M., Elliott, A., Gaffin, J., Jones, D., ... Schofield, P. (2013). Evidence-based clinical practice guidelines on the management of pain in older people: Executive summary. *British Journal of Pain*, 7(3), 152-154. doi:10.1177/2049463713495669
- Allcock, N., Elkan, R., & Williams, J. (2009). Patients referred to a pain management clinic: Beliefs, expectations and priorities. *Journal of Advanced Nursing*, 60(3), 248-256. doi:10.1111/j.1365-2648.2007.04400.x
- Alschuler, K., & Otis, J. (2013). Significant others' responses to pain in veterans with chronic non-cancer pain and clinical levels of post-traumatic stress disorder symptomatology. *European Journal of Pain*, 17(2), 245-254. doi:10.1002/j.1532-2149.2012.00180.x
- American College of Physicians and the American Pain Society. (2007). Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society.. *Annals of Internal Medicine*, 147(7), 478-491. doi:10.7326/0003-4819-147-7-200710020-00006
- American Music Therapy Association. (2014) What is music therapy? Retrieved from <http://www.musictherapy.org/>
- Blog Builders. (2016, November 17). How to start a blog and get it right. Retrieved from <http://www.theblogbuilders.com/>
- Bohnert, A., Valenstein, M., Bair, M., Ganoczy, D., McCarthy, J., Ilgen, M., & Blow, F. (2011). Association between opioid prescribing patterns and opioid overdose-

- related deaths. *JAMA: Journal of the American Medical Association*, 305(13), 1315-1321. doi:10.1001/jama.2011.370
- Brasil, V., Zatta, L., Cordeiro, J., Silva, A., Zatta, D., & Barbosa, M. (2008). Quality of life of people with chronic pain after acupuncture treatment. *Revista Eletronica De Enfermagem*, 10(2), 383-394.
- Brosseau, L., Wells, G. A., Poitras, S., Tugwell, P., Casimiro, L., Novikov, M., ... Cohoon, C. (2012). Ottawa Panel evidence-based clinical practice guidelines on therapeutic massage for low back pain. *Journal of Bodywork and Movement Therapies*, 16(4), 424-455. doi:10.1016/j.jbmt.2012.04.002
- Bruce, B. K., & Harrison, T. E. (2013). *Mayo Clinic guide to pain relief* (2<sup>nd</sup> ed.). Rochester, MN: Mayo Clinic.
- Buckenmaier, C. C., Galloway, K. T., Polomano, R. C., McDuffie, M., Kwon, N., & Gallagher, R. M. (2013). Preliminary validation of the Defense and Veterans Pain Rating Scale (DVPRS) in a military population. *Pain Medicine*, 14(1), 110-123. doi:10.1111/j.1526-4637.2012.01516.x
- Centers for Disease Control. (2011). Vital signs: Overdoses of prescriptions opioid pain relievers—United States, 1999-2008. *Morbidity and Mortality Weekly Report*, 60, 1487-1492.
- Cepeda, M. S. (2015). Music for pain relief. *Cochrane Database of Systematic Reviews*, 11. doi:10.1002/14651858.CD004843.pub3-
- Chou, R., & Huffman, L. (2007). Nonpharmacologic therapies for acute and chronic low back pain: A review of the evidence for an American Pain Society/American

College of Physicians clinical practice guideline [corrected] [published erratum appears in ANN INTERN MED 2008 Feb 5;148(3):247]. *Annals of Internal Medicine*, 147(7), 492-504.

Chou, R., Qaseem, A., Snow, V., Casey, D., Cross J.T, J., Shekelle, P., & Owens, D. (2007). Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society [corrected] [published erratum appears in ANN INTERN MED 2008 Feb 5;148(3):247]. *Annals of Internal Medicine*, 147(7), 478-485.

Cramer, H., Lauche, R., Haller, H., & Dobos, G. (2013). A systematic review and meta-analysis of yoga for low back pain [Structured abstract]. *Clinical Journal of Pain*, 29(5), 450-460.

Cramer, H., Lauche, R., Haller, H., Langhorst, J., Dobos, G., & Berger, B. (2013). "I'm more in balance": A qualitative study of yoga for patients with chronic neck pain. *Journal of Alternative & Complementary Medicine*, 19(6), 536-542.  
doi:10.1089/acm.2011.0885

Crawford, C., Lee, C., & Bingham, J. (2014). Sensory art therapies for the self-management of chronic pain symptoms. *Pain Medicine (Malden, Mass.)*, 15 Suppl 1, S66-S75. doi:10.1111/pme.12409

DeCarvalho, L. T. (2007). The experience of chronic noncancer pain and PTSD. A guide for health care providers. Retrieved from National Center for PTSD:  
<http://www.ptsd.va.gov/professional/pages/chronic-pain-providers.asp>

Defense and veteran pain rating scale (DVPRS), (n.d.). Retrieved from

<http://www.dvcipm.org/clinical-resources/pain-rating-scale>

Denneson, L. M., Corson, K., & Dobscha, S. K. (2011). Complementary and alternative medicine use among veterans with chronic noncancer pain. *Journal of Rehabilitation Research & Development*, 48(9), 1119-1127.

Department of Health and Human Services. (2014). *About healthy people*. Retrieved from <http://healthypeople.gov/2020/about/default.aspx>

Dickinson, K. C., Sharma, R., Duckart, J. P., Corson, K., Gerrity, M. S., & Dobscha, S. K. (2010). VA healthcare costs of a collaborative intervention for chronic non cancer pain in primary care. *Medical Care*, 48(1), 38-44. Retrieved from [doi.org/doi:10.1097/MLR.0b013e3181bd49e2](http://doi.org/doi:10.1097/MLR.0b013e3181bd49e2)

Eaves, E. R., Sherman, K. J., Ritenbaugh, C., Hsu, C., Nichter, M., Turner, J. A., & Cherkin, D. C. (2015). A qualitative study of changes in expectations over time among patients with chronic low back pain seeking four CAM therapies. *BMC Complementary & Alternative Medicine*, 15(1), 1. doi:10.1186/s12906-015-0531-9

Eaves, E. R., Ritenbaugh, C., Nichter, M., Hopkins, A. L., & Sherman, K. J. (2014). Modes of hoping: Understanding hope and expectation in the context of a clinical trial of complementary and alternative medicine for chronic pain. *Explore*, 10(4), 225-232. doi:10.1016/j.explore.2014.04.004

Ehde, D. M., Dillworth, T. M., Turner, J. A., & Anderson, N. (2014). Cognitive-behavioral therapy for individuals with chronic pain: Efficacy, innovations, and directions for research. *The American Psychologist*, (2), 153.

- Fishman, S. M., Rathmell, J. P., & Ballantyne, J. C. (2009). *Bonica's management of pain* (4th ed.). Philadelphia: Wolters Klumer/ Lippincott Williams & Wilkins.
- Fletcher, C. E., Mitchinson, A., Trumble, E., Hinshaw, B., Dusek, J. (2016). Perceptions of other integrative health therapies by veterans with pain who are receiving massage. *Journal of Rehabilitation Research & Development*, 53,(1), 117. doi:10.1682/JRRD.2015.01.0015
- Fouladbakhsh, J. (2012). Complementary and alternative modalities to relieve osteoarthritis symptoms. *American Journal of Nursing*, 112(3), S44-51.
- Furlan, A. D., Imamura, M., Dryden, T., & Irvin, E. (2010). *Massage for low back pain*. Retrieved from Cochrane Database for Systematic Reviews:
- Gibbons, S.W., Migliore, L. Convoy, S.P., Greiner, S., DeLeon, P.H. (2014). Military mental health stigma challenges: Policy & practices considerations. *Journal of Nurse Practitioners* 10,6. doi.org/1016/jurpra2014.03.021
- Gibson, C. A. (2012). Review of posttraumatic stress disorder and chronic non- cancer pain: The path to integrated care. *Journal of Rehabilitation Research & Development (JRRD)*, 49, 753-776. doi.org/753-776.  
doi:10.1682/JRRD.2011.09.0158
- Gold, A., & Clare, A. (2013). An exploration of music listening in chronic pain. *Psychology of Music*, 41(5), 545-564. doi:10.1177/0305735612440613
- Gregory, J. (2014). Dealing with acute and chronic pain: Part two -- management. *Journal of Community Nursing*, 28(5), 24.
- Groessler, E. J., Weingart, K. R., Johnson, N., & Baxi, S. (2012). The benefits of yoga for

- women with chronic low back pain. *Journal of Alternative & Complementary Medicine*, 18, 832-838..doi.org/10.1089/ACM.2010.0657
- Groessl, E. J. Weingart, K. R., Aschbacher, K., Pada, L., & Baxi, S. (2008). Yoga for veterans with chronic low-back pain. *The Journal of Alternative and Complementary Medicine*, 14, 1123-1129. doi: 10.1089/acm.2008.0029
- Guetin, S., Ginies, P. Siou, D. K., Picot, M.C., Pommie, C., Guldner, E., Gosp, A..M. ...Touchon, J. (2012). The effects of music intervention in the management of chronic pain: A single blind randomized, controlled trial. *Clinical Journal of Chronic Pain*, (4): 329-37. doi: 10.1097/AJP.0b013e31822be973
- Guevara-Lopez, U., Covarrubias-Gomez, A., Elias-Dib, J., Reyes-Sanchez, A., & Rodriguez-Reyna, T. (n.d). Practice guidelines for the management of low back pain. *Cirugia Y Cirujanos*, 79(3), 264-279. doi:10.1682/JRRD.2011.09.0158
- .Hall, A., Maher, C., Latimer, J., & Ferreira, M. (2009). The effectiveness of tai chi for chronic musculoskeletal pain conditions: Asystematic review and meta-analysis (Structured abstract). *Arthritis and Rheumatism (Arthritis Care and Research)*, 61(6), 717-724.
- Hassett, A., & Williams, D. (2011). Non-pharmacological treatment of chronic widespread musculoskeletal pain. *Best Practice & Research in Clinical Rheumatology*, 25(2), 299-309.
- Hinman, R. S., McCrory, P., Pirootta, M., Relf, I., Forbes, A., Crossley, K. M., & ... Bennell, K. L. (2014). Acupuncture for chronic knee pain: A randomized clinical trial. *JAMA: Journal of The American Medical Association*, 312(13), 1313-1322.



- Korhan, E., Uyar, M., Eyig r, C., Hakverdiođlu Y nt, G.,  elik, S., & Khorshid, L. (2014). The effects of music therapy on pain in patients with neuropathic pain. *Pain Management Nursing*, 15(1), 306-314. doi:10.1016/j.pmn.2012.10.006
- Larner, D. (2013). Chronic non- cancer pain transition: A concept analysis. *Pain management Nursing: Official Journal of the American Society of Pain Management Nurses*. Retrieved from <http://dx.doi.org/http://dx.doi.org.ezp.waldenulibrary.org/10.1016/j.pmn.2013.04.003>
- Lauche, R., Stumpe, C., Fehr, J., Cramer, H., Cheng, Y. W., Wayne, P. M.,..., Dobos, G. (2016). The effects of tai chi and neck exercises in the treatment of chronic nonspecific neck pain: A randomized controlled trial. *The Journal of Pain*, 17(9), 1013-1027. doi:10.1016/j.jpain.2016.06.004
- Lee, C., Crawford, C., & Schoomaker, E. (2014). Movement Therapies for the Self- Management of Chronic Pain Symptoms. *Pain Medicine*, 15S40-S53.
- Lee, C., Crawford, C. & Hickey, A. (2014). Mind-body therapies for the self - management of chronic pain symptoms. *Pain Medicine*, 15S21-S39.
- Lee, C., Crawford, C., Teo, L., & Spevak, C., (2014). An analysis of the various chronic pain conditions captured in a systematic review of active self-care complementary and integrative medicine therapies for the management of pain symptoms. *Pain Medicine*, 15:S96-S103.
- Liang, Z., Zhu, X., Yang, X., Fu, W., & Lu, A. (2011). Assessment of a traditional acupuncture therapy for chronic neck pain: A pilot randomized controlled study. *Complementary Therapies in Medicine*, 19(Supplement 1), S26-S32.

doi:10.1016/j.ctim.2010.11.005

Ligen, M.A., Kleinburg, F., Ignacio, R.V., Bohnert, A.S., Valenstein, M., McCarthy, J.

F., ... Katz, I. R. (2013). Noncancer pain conditions and risk of pain. *JAMA*

*Psychiatry*, 7, 692-697. doi.org/10.1001/jamapsychiatry.2013.908

Little, P., Lewith, G., Webley, F., Evans, M., Beattie, A., Middleton, K., ... Sharp, D.

(2008). Randomized controlled trial of Alexander technique lessons, exercise, and

massage (ATEAM) for chronic and recurrent back pain. *British Journal of Sports*

*Medicine*, 42(12), 965-968.

Longacre, M., Silver-Highfield, E., Lama, P., & Grodin, M. (2012). Complementary and

alternative medicine in the treatment of refugees and survivors of torture: a review

and proposal for action. *Torture: Quarterly Journal on Rehabilitation of Torture*

*Victims and Prevention of Torture*, 22(1), 38-5

MacPherson, H., Tilbrook, H., Richmond, S., Woodman, J., Ballard, K., Atkin, K.,...

Watt, I. (2015). Alexander technique lessons or acupuncture sessions for persons

with chronic neck pain: A randomized trial. *Annals of Internal Medicine*, 163(9),

653-662. doi:10.7326/M15-0667

Mayo Clinic (2011). *Complementary & Alternative Medicine and your health*. Retrieved

from <http://store.mayoclinic.com/BMC/pdf/books/294200/premium/294200.pdf>

McKee, M., Kligler, B., Fletcher, J., Biryukov, F., Casalaina, W., Anderson, B., & Blank,

A. (2013). Outcomes of acupuncture for chronic pain in urban primary care.

*Journal of The American Board of Family Medicine*, 26(6), 692-700.

- Mehl-Madrona, L., B. & Plummer, J. (2016). Integration of complementary and alternative medicine therapies into primary-care pain management for opiate reduction in a rural setting. *The Journal of Alternative and Complementary Medicine*. (22), 621-626. doi 101089/acm.2015.0212.
- Melnyk, B. M., & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing & healthcare-a guide to best practice* (3rd ed.). Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins.
- Morasco, B. J., Lovejoy, T. I., Lu, M., Turk, D. C., Lewis, L., & Dobscha, S. K. (2013). The relationship between PTSD and chronic pain: Mediating role of coping strategies and depression. *Pain*, 154(4), 609-616.  
doi.org/doi:10.1016/j.pain.2013.01.001
- Monticone, M., Cedraschi, C., Ambrosini, E., Rocca, B., Fiorentini, R., Restelli, M., ... Moja, L. (2015). Cognitive-behavioural treatment for subacute and chronic neck pain. Retrieved from *Cochrane Database of Systematic Reviews*, (5),
- Murdough, B. (2009). Pain, depression, PTSD, and the silent wounds of war. *EP Magazine*, 39(5), 83-85. Retrieved from CINAHL Plus with Full Text.
- National Guideline Clearinghouse (NGC). Guideline summary: VA/DoD clinical practice guideline for the non-surgical management of hip and knee osteoarthritis. In: National Guideline Clearinghouse (NGC) [Web site]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2014 Jan 01. [cited 2016 Nov 05]. Retrieved from <https://www.guideline.gov>
- National Institutes of Health, National Center for Complementary and Alternative

- Medicine. (2013). Complementary, alternative, or integrative health: What's in a name. Retrieved from <http://nccam.nih.gov/health/whatiscam>
- Otis, J.D. (2007). *Managing chronic pain: A cognitive-behavioral approach*. Oxford: Oxford University Press.
- Park, J., & Hughes, A. (2012). Nonpharmacological approaches to the management of chronic pain in community-dwelling older adults: A review of empirical evidence (Structured abstract). *Journal of The American Geriatrics Society*, 60(3), 555-568.
- Polit, D. F., & Beck, C. T. (2008) *Nursing research: generating and assessing evidence for nursing practice* Eighth Edition. Philadelphia, Pa. Lippincott Williams & Wilkins.
- Reid, M., Papaleontiou, M., Ong, A. Breckman, R., Wethington, E., & Pillemer, K., (2008). Self-management strategies to reduce pain and improve function among older adults in community settings: A review of the evidence. *Pain Medicine*, 9(4), 409-424. doi:10.1111/j.1526-4637.2008.00428.x
- Reiner, K., Tibi, L., & Lipsitz, J. D. (2013). Do Mindfulness-Based Interventions Reduce Pain Intensity? A critical review of the literature. *Pain Medicine*, 14(2), 230-242. doi:10.1111/pme.12006
- Rhodes, L., Groninger, H., & Malchow, R. (n.d.). Key concepts in pain management for the federal healthcare professional [dialogues in clinical practice]. *Med-IQ*, 1-9. Retrieved from <http://www.med-iq.com/index.cfm?fuseaction=courses.overview&cID=607#.UdoOwm1vSQI>

- Rocha, K., Ribeiro, A., Rocha, K.C., Sousa, M., Albuquerque F., Ribeiro, S., ... (2012). Improvement in physiological and psychological parameters after 6 months of yoga practice. Improvement in physiological and psychological parameters after 6 months of yoga practice. *Consciousness and Cognition*, 21. 843-850. doi: 10.1016/j.concog.2012.01.014
- Rosenberger, P. H., Philip, E. J., Lee, A., & Kerns, R. D. (2011). The VHA's national pain management strategy: implementing the stepped care model [Updates in Specialty Care]. *Federal Practitioner*, 39-42. Retrieved from <http://www.chronicpainperspectives.com/PDF/CHPP/FP028080039.pdf>
- Rubinstein, S., van Middelkoop, M., Kuijpers, T., Ostelo, R., Verhagen, A., de Boer, M., ... van Tulder, M. (2010). A systematic review on the effectiveness of complementary and alternative medicine for chronic non-specific low-back pain. *European Spine Journal*, 19(8), 1213-1228. doi 10.1007/s00586-010-1356-3
- Samwel, H. A., Kraaimaat, F. W., Crul, B. P., van Dongen, R. D., & Evers, A. M. (2009). Multidisciplinary allocation of chronic pain treatment: Effects and cognitive-behavioural predictors of outcome. *British Journal of Health Psychology*, 14(3), 405-421. doi:10.1348/135910708X337760
- Sang-Dol, K. (2016). Effects of yoga on chronic neck pain: a systematic review of randomized controlled trials. *Journal of Physical Therapy Science*, 28(7), 2171.
- Saper, R., Boah, A., Keosaian, J., Cerrada, C., Weinberg, J., & Sherman, K. (2013). Comparing once-versus twice-weekly yoga classes for chronic low back pain in predominantly low income minorities: A randomized dosing trial. *Evidence-*

*Based Complementary and Alternative Medicine, d0*

- Saper, R., Sherman, K., Cullum-Dugan, D., Davis, R., Phillips, R., & Culpepper, L. (2009). Yoga for chronic low back pain in a predominantly minority population: a pilot randomized controlled trial. *Alternative Therapies in Health & Medicine, 15*(6), 18-27.
- Schafer, L., Hsu, C., Eaves, E., Ritenbaugh, C., Turner, J., Cherkin, D., .... (2012). Complementary and alternative medicine (CAM) providers' views of chronic low back pain patients' expectations of CAM therapies: a qualitative study?????????
- Schoemaker, E., & Buckenmaier, C. (2014). Call to action: 'If not now, when? If not you, who?'. *Pain Medicine, 15*S4-6. doi:10.1111/pme.12385
- Sehgal, N., Colson, J., & Smith, H. S. (2013). Chronic non cancer pain treatment with opioid analgesics. *Expert Neurother, 13*(11), 1201-1220.
- Sherman, L. (2012). News. *Journal of Chinese Medicine, (100)*, 72-80. Retrieved from CINAHL Plus with Full Text
- Skillgate, E., Bill, A., Cote, P., Viklund, P., Peterson, A., & Holm, L. (2015). The effect of massage therapy and/or exercise therapy on subacute or long-lasting neck pain - the Stockholm neck trial (STONE): study protocol for a randomized controlled trial. *Trials, 16 pending study results. BMC.16:414*. doi: 10.1186/s13063-015-0926-4
- Smeeding, J. W., Bradshaw, D. H., Kumpfer, K., Trevithick, S., & Stoddard, G. J. (2010). Outcome evaluation of the Veteran Affairs Salt Lake City Integrative Health Clinic for chronic non cancer pain and stress related depression, anxiety, and post-

- traumatic stress disorder. *The Journal of Alternative and Complementary Medicine*, 16(8), 823-835. doi.org/doi: 10.1089/acm.2009.0510
- Streeter, C. C., Gerbarg, P. L., Saper, R. B., Ciraulo, D. A., & Brown, R. P. (2012). Effects of yoga on the autonomic nervous system, gammaminobutyric, and allostasis in epilepsy, depression, and post-traumatic stress disorder. *Medical Hypotheses*, 78, 571-579. doi.org/10.1016/j.mehy.2012.021
- Stetler, C. (2001). Updating the Stetler model of research utilization to facilitate evidence-based practice. *Nursing Outlook*, 49(6), 272-279.
- Tan, G., Craine, M. H., Bair, M. J., Garcia, M. K., Giordano, J., Jensen, M. P.,... Tsao, J. I. (2007). Efficacy of selected complementary and alternative medicine interventions for chronic pain. *Journal of Rehabilitation Research and Development*, 44(2), 195-222.
- Taylor, P., Pezzullo, L., Grant, S., & Bensoussan, A. (2013). Cost-effectiveness of acupuncture for chronic nonspecific low back pain. doi: 10.1111/papr.12116The
- Joint Commission (TJC). (2012). safe use of opioids in hospitals. *The Joint Commission Sentinel Event Alert*. 49. Retrieved from [http://www.jointcommission.org/sea\\_issue\\_49/](http://www.jointcommission.org/sea_issue_49/)
- Teut, M., Knilli, J., Daus, D., Roll, S., & Witt, C. M. (2016). Qigong or yoga versus no intervention in older adults with chronic low back pain-a randomized controlled trial. *The Journal of Pain: Official Journal of The American Pain Society*, 17(7), 796-805. doi:10.1016/j.jpain.2016.03.003
- Tunks, E., Crooks, J., & Weir, R. (2008). Epidemiology of chronic non cancer pain with

psychological comorbidity: Prevalence, risk, course, and prognosis. *Canadian Journal of Psychiatry. Revue Canadienne De Psygiatrie*, 53(4), 224-234.

Retrieved from CINAHL Plus with Full Text

Walden University. (2013-2014). Social change. Retrieved from

<http://catalog.waldenu.edu/index.php>

Walker, R. L., Clark, M. E., & Sanders, S. H. (2010). The “Post-deployment multi-symptom disorder”: An emerging syndrome in need of a new treatment paradigm. *Psychological Services*, 7, 136-147. [dx.doi.org/doi:10.1037/a0019684](https://doi.org/10.1037/a0019684)

Webster, L. R., & Markman, J. (2014). Medical management of chronic low back pain: efficacy and outcomes. *Neuromodulation: Journal of the International Neuromodulation Society*, 17 Suppl 218-23. [doi:10.1111/j.1525-1403.2012.00496.x](https://doi.org/10.1111/j.1525-1403.2012.00496.x)

Weib, J., Quante, S., Xue, F., Muche, R., & Reuss-Borst, M. (2013). Effectiveness and acceptance of acupuncture in patients with chronic low back pain: Results of a prospective, randomized, controlled trial. *Journal of Alternative & Complementary Medicine*, 19(12), 935-941. [doi:10.1089/acm.2012.0338](https://doi.org/10.1089/acm.2012.0338)

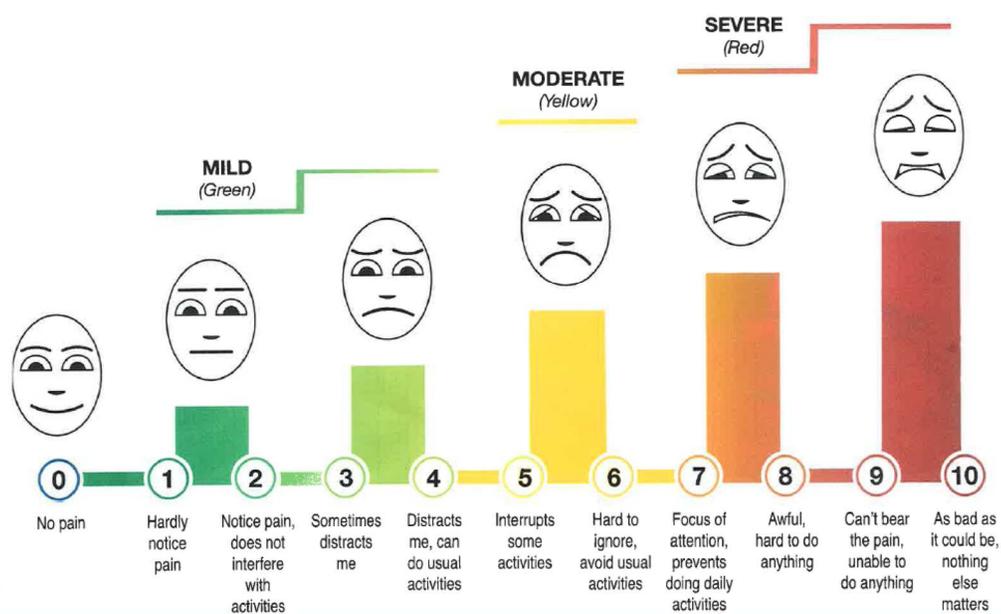
Wieland, L. S. (2013). Yoga treatment for chronic non-specific low-back pain. *Cochrane Database of Systematic Reviews*, (7), [doi:10.1002/14651858.CD010671](https://doi.org/10.1002/14651858.CD010671)

Wong, S., Chan, F., R., Chu, M., Kitty, L., Y., Mercer, S. & Ma, S. (2011). Comparing the effectiveness of mindfulness-based stress reduction and multidisciplinary intervention programs for chronic pain: A randomized comparative trail. *Clinical Journal of Pain* 27(8), 724-734. [doi: 10.1097/AJP.0b013e3182183c6e](https://doi.org/10.1097/AJP.0b013e3182183c6e)

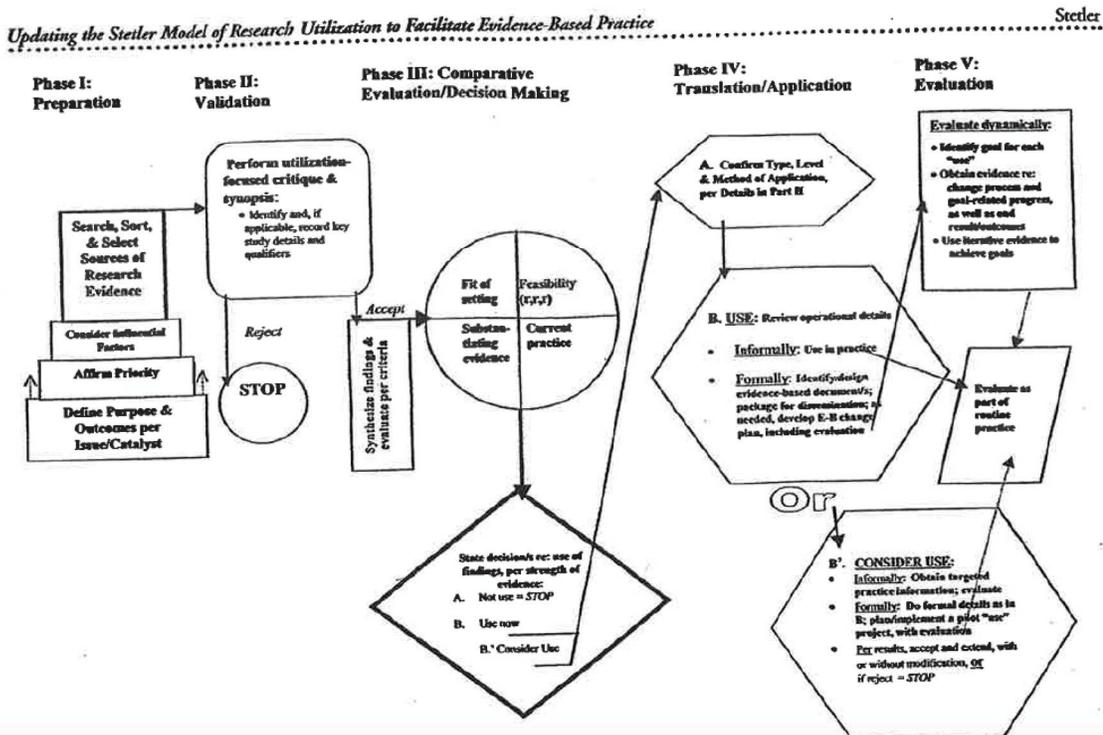
- Xu, M., Yan, S., Xu, Y., Xiuyang, L., Shuguang, G., Rui, H. Licheng, W., ... (2013). Acupuncture for chronic low back pain in long-term follow-up: A meta-analysis of 13 randomized control trials. *The American Journal of Chinese Medicine* 41 (1), 1-19. doi: 10.1142/S0192415X13500018
- Yuan, J., Purepong, N., Hunter, R., Kerr, D., Park, J., Bradbury, I., & McDonough, S. (2009). Different frequencies of acupuncture treatment for chronic low back pain: an assessor-blinded pilot randomized controlled trial. *Complementary Therapies in Medicine*, 17(3), 131-140. doi:10.1016/j.ctim.2008.10.003
- Yukari, T., Noriko, Y., Yoshiki, A., & Mizue, S. (2015). Literature review of pain management for people with chronic pain. *Japan Journal of Nursing Science*, 12(3), 167-183. doi:10.1111/jjns.12065
- Zhang, F., Kong, L., Zhang, Y., & Li, S. (n.d). Evaluation of impact on health-related quality of life and cost effectiveness of traditional chinese medicine: A systematic review of randomized clinical trials. *Journal of Alternative and Complementary Medicine*, 18(12), 1108-1120.
- Zheng, Z. & Xue, C.C.L. (2013). Pain research in complementary and alternative medicine in Australia: A critical review. *The Journal of Alternative and Complementary Medicine*, 19(2), 81-91. doi: 1089/acm.2011.0233
- Zunin, I. D., Orenstein, S., Chang, M., & Cho, S. (2009). Comprehensive pain program outcomes evaluation: A preliminary study in Hawaii. *Hawaii Medical Journal*, 68, 158-161. doi: 10.1046/j.1464-5491.2001.00435. x. 8.

## Appendix A: Pain Scale: DVPRS

## Defense and Veterans Pain Rating Scale



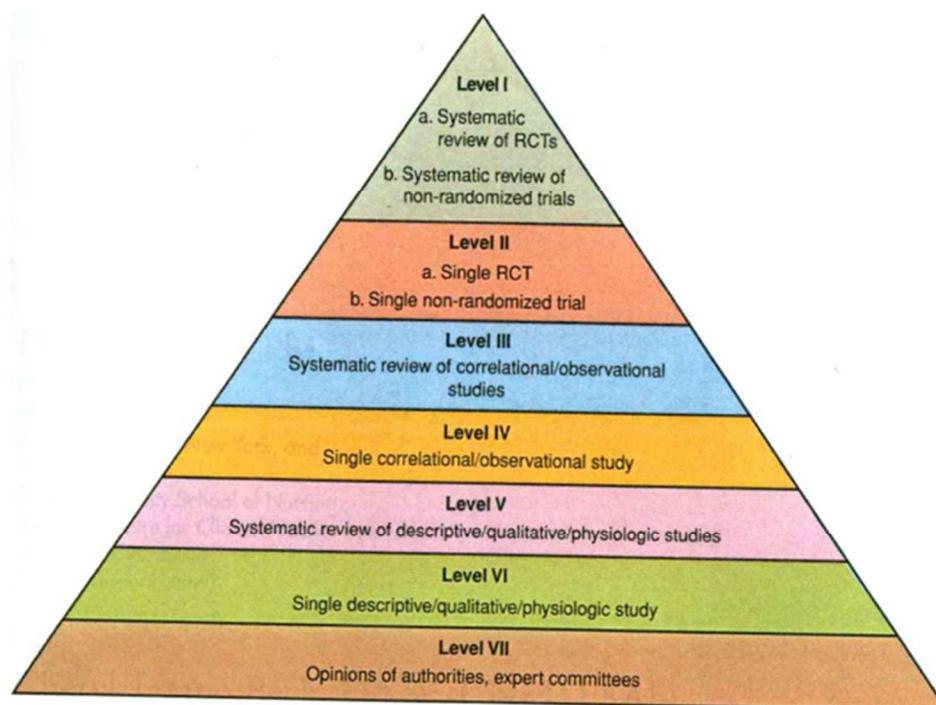
Appendix B: Stetler Model



From "Updating the Stetler Model of Research Utilization to Facilitate Evidence-Based Practice," by C. B. Stetler, 2001, *Nursing Outlook*, 49, figure 3A. Copyright 2001 by Elsevier. Reprinted with permission.

## Appendix C: Levels of Evidence

## Quick Guide to Designs in an Evidence Hierarchy



Polit, D.F., & Beck, C.T. (2008). *Nursing Research: generating and assessing evidence for nursing practice*. Eight Edition. Lippincott Williams & Wilkins. Philadelphia. p. 219.

From *Nursing Research: Generating and Assessing Evidence for Nursing Practice* (p. 219), by D. F. Polit & C. T. Beck, 2008, Philadelphia, PA: Lippincott Williams & Wilkins. Copyright 2008 by Copyright Holder.

## Appendix D: Critical Appraisal Checklists

### Print & Use to Rapidly Critically Appraise Qualitative Evidence

- 1) Are the results of the study valid (i.e., trustworthy and credible)?**
- a) How were study participants chosen? \_\_\_\_\_
- b) How were accuracy and completeness of data assured? \_\_\_\_\_
- c) How plausible/believable are the results?
- i) Are implications of the research stated? Yes No Unknown
- (1) May new insights increase sensitivity to others' needs? Yes No Unknown
- (2) May understandings enhance situational competence? Yes No Unknown
- d) What is the effect on the reader?
- (1) Are results plausible and believable? Yes No Unknown
- (2) Is the reader imaginatively drawn into the experience? Yes No Unknown
- 2) What were the results?**
- a) Does the research approach fit the purpose of the study? Yes No Unknown
- i) How does the researcher identify the study approach? Yes No Unknown
- (1) Are language and concepts consistent with the approach? Yes No Unknown
- (2) Are data collection and analysis techniques appropriate? Yes No Unknown
- ii) Is the significance/importance of the study explicit? Yes No Unknown
- (1) Does review of the literature support a need for the study? Yes No Unknown
- (2) What is the study's potential contribution? \_\_\_\_\_
- iii) Is the sampling strategy clear and guided by study needs? Yes No Unknown
- (1) Does the researcher control selection of the sample? Yes No Unknown
- (2) Do sample composition and size reflect study needs? Yes No Unknown
- b) Is the phenomenon (human experience) clearly identified?
- i) Are data collection procedures clear? Yes No Unknown
- (1) Are sources and means of verifying data explicit? Yes No Unknown
- (2) Are researcher roles and activities explained? Yes No Unknown
- ii) Are data analysis procedures described? Yes No Unknown
- (1) Does analysis guide direction of sampling and when it ends? Yes No Unknown
- (2) Are data management processes described? Yes No Unknown
- c) What are the reported results (description or interpretation)?
- i) How are specific findings presented? \_\_\_\_\_

**Print & Use to Rapidly Critically Appraise Cohort Studies**

**1. Are the results of the study valid?**

- |  |     |    |         |
|--|-----|----|---------|
| a. Was there a representative and well defined sample of patients at a similar point in the course of the disease? | Yes | No | Unknown |
| b. Was follow up sufficiently long and complete?   | Yes | No | Unknown |
| c. Were objective and unbiased outcome criteria used?  | Yes | No | Unknown |
| d. Did the analysis adjust for important prognostic risk factors and confounding variables?                        | Yes | No | Unknown |

**2. What are the results?**

- |   |       |
|---|-------|
| a. What is the magnitude of the relationship between predictors (i.e., prognostic indicators) and targeted outcome? | _____ |
| b. How likely is the outcome event(s) in a specified period of time?  | _____ |
| c. How precise are the study estimates?   | _____ |

**3. Will the results help me in caring for my patients?**

- |   |     |    |         |
|---|-----|----|---------|
| a. Were the study patients similar to my own?                       | Yes | No | Unknown |
| b. Will the results lead directly to selecting or avoiding therapy? | Yes | No | Unknown |
| c. Are the results useful for reassuring or counseling patients?    | Yes | No | Unknown |

**Print & Use to Rapidly Critically Appraise Randomized Clinical Trials (RCTs)**

1. Are the results of the study valid?
  - a. Were the subjects randomly assigned to the experimental and control groups?      Yes    No    Unknown
  - b. Was random assignment concealed from the individuals who were first enrolling subjects into the study?      Yes    No    Unknown
  - c. Were the subjects and providers blind to the study group?      Yes    No    Unknown
  - d. Were reasons given to explain why subjects did not complete the study?      Yes    No    Unknown
  - e. Were the follow-up assessments conducted long enough to fully study the effects of the intervention?      Yes    No    Unknown
  - f. Were the subjects analyzed in the group to which they were randomly assigned?      Yes    No    Unknown
  - g. Was the control group appropriate?      Yes    No    Unknown
  - h. Were the instruments used to measure the outcomes valid and reliable?      Yes    No    Unknown
  - i. Were the subjects in each of the groups similar on demographic and baseline clinical variables?      Yes    No    Unknown
2. What are the results?
  - a. How large is the intervention or treatment effect (NNT, NNH, effect size, level of significance)?      \_\_\_\_\_
  - b. How precise is the intervention or treatment (CI)?      \_\_\_\_\_
3. Will the results help me in caring for my patients?
  - a. Were all clinically important outcomes measured?      Yes    No    Unknown
  - b. What are the risks and benefits of the treatment?      \_\_\_\_\_
  - c. Is the treatment feasible in my clinical setting?      Yes    No    Unknown
  - d. What are my patients/family's values and expectations for the outcome that is trying to be prevented and the treatment itself?      \_\_\_\_\_

Modified from Melnyk, B. (2004). Rapid Critical Appraisal of Randomized Controlled Trials (RCTs): An Essential Skill for Evidence-Based Practice. *Melnyk, Pediatric Nursing Journal*.  
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**Rapid Critical Appraisal of Systematic Reviews of Clinical Interventions/Treatments**

1. Are the results of the review valid?
  - a. Are the studies contained in the review randomized controlled trials? Yes No Unknown
  - b. Does the review include a detailed description of the search strategy to find all relevant studies? Yes No Unknown
  - c. Does the review describe how validity of the individual studies was assessed (e.g., methodological quality, including the use of random assignment to study groups and complete follow-up of the subjects)? Yes No Unknown
  - d. Were the results consistent across studies? Yes No Unknown
  - e. Were individual patient data or aggregate data used in the analysis? Yes No Unknown
  
2. What were the results?
  - a. How large is the intervention or treatment effect (OR, RR, effect size, level of significance)? \_\_\_\_\_
  - b. How precise is the intervention or treatment (CI)? \_\_\_\_\_
  
3. Will the results assist me in caring for my patients?
  - a. Are my patients similar to the ones included in the review? Yes No Unknown
  - b. Is it feasible to implement the findings in my practice setting? Yes No Unknown
  - c. Were all clinically important outcomes considered, including risks and benefits of the treatment? Yes No Unknown
  - d. What is my clinical assessment of the patient and are there any contraindications or circumstances that would inhibit me from implementing the treatment? Yes No Unknown
  - e. What are my patient's and his or her family's preferences and values about the treatment that is under consideration? Yes No Unknown

**Print & Use to Rapidly Critically Appraise Evidence-based Clinical Practice Guidelines**

**CREDIBILITY**

- |   |       |    |         |
|---|-------|----|---------|
| 1) Who were the guideline developers?   | _____ |    |         |
| 2) Were the developers representative of key stakeholders in this specialty (interdisciplinary)?  | Yes   | No | Unknown |
| 3) Who funded the guideline development?  | _____ |    |         |
| 4) Were any of the guideline developers funded researchers of the reviewed studies?   | Yes   | No | Unknown |
| 5) Did the team have a valid development strategy?  | Yes   | No | Unknown |
| 6) Was an explicit (how decisions were made), sensible and impartial process used to identify, select, and combine evidence?                        | Yes   | No | Unknown |
| 7) Did its developers carry out a comprehensive, reproducible literature review within the past 12 months of its publication/revision?              | Yes   | No | Unknown |
| 8) Were all important options and outcomes considered?  | Yes   | No | Unknown |
| 9) Is each recommendation in the guideline tagged by the level/strength of evidence upon which it is based and linked with the scientific evidence? | Yes   | No | Unknown |
| 10) Do the guidelines make explicit recommendations (reflecting value judgments about outcomes)?  | Yes   | No | Unknown |
| 11) Has the guideline been subjected to peer review and testing?  | Yes   | No | Unknown |

**APPLICABILITY/GENERALIZABILITY**

- |  |     |    |         |
|--|-----|----|---------|
| 12) Is the intent of use provided (e.g. national, regional, local)?                                | Yes | No | Unknown |
| 13) Are the recommendations clinically relevant?   | Yes | No | Unknown |
| 14) Will the recommendations help me in caring for my patients?                                    | Yes | No | Unknown |
| 15) Are the recommendations practical/feasible (e. g. resources [people and equipment] available)? | Yes | No | Unknown |
| 16) Are the recommendations a major variation from current practice?                               | Yes | No | Unknown |
| 17) Can the outcomes be measured through standard care?  | Yes | No | Unknown |

Modified from Stanek, J. (2005). Using Evidence-based Guidelines: Tools for Improving Practice. In R.M. Melnyk & E. Fineout-Overholt (Eds). *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice*. (pp. 223-236). Philadelphia: Lippincott, Williams & Wilkins.

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