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Alternative Therapy for Veterans Diagnosed With Post-Traumatic Stress Disorder

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This is to certify that the doctoral study by

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Walden University
2020

Abstract

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MSN, Walden University, 2011

BSN, Winston-Salem State University, 2009

Project Submitted in Partial Fulfillment

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Abstract

An increasing number of veterans diagnosed with post-traumatic stress disorder (PTSD) has led to an increased demand for treatment within the Veteran Affairs health care system. Presently, veterans diagnosed with PTSD receive psychotropic medications and intermittent therapy sessions. Nurses are challenged to educate veterans about other health care issues based on verbalized side effects from prescribed PTSD medications limiting veterans' ability to focus. Identifying alternative treatment options may improve treatment choices, reduce side effects, and promote positive outcomes for veterans with PTSD. This systematic review provided evidence-based practice information by addressing whether alternative therapy such as biofeedback would improve the therapeutic response and reduce the need for psychotropic medications. The Iowa model was used to guide the study. A critical review of the literature included 15 studies deemed admissible based on the Melnyk pyramid. Thirteen of the studies indicated positive outcomes for PTSD using biofeedback options as forms of therapy. No studies addressed the effectiveness of biofeedback therapy for reducing the need for psychotropic medications. One study indicated that when complementary and alternative medicine therapies were used to augment pharmacotherapy options, treatment compliance improved. Control studies are recommended to evaluate the immediate and long-term effects of biofeedback therapy to improve individual and adjunctive therapies for veterans with PTSD.

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Section 1: Nature of the Project

Post-traumatic stress disorder (PTSD) is a diagnosis that includes an exposure to a traumatic event. Post-traumatic events were recorded on a cuneiform tablet detailing the death in battle of King Urnamma (2111-2094 BC) and its effects (Fluckiger-Hawker, as cited in Ezra, 2001); however, PTSD as a mental health diagnosis was not added by the American Psychiatric Association until the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* in 1980 (Friedman, 2007). Approximately 7.8% of the general population will experience PTSD at some point in their lives (Gradus, 2015), whereas many veterans have been to a theater of combat and have experienced one or more traumatic events that led to a diagnosis of PTSD. Approximately 28.9% of Vietnam veterans (male and female), 12.1% of Gulf War veterans, and 13.8% of Operation Enduring Freedom/Operation Iraqi Freedom veterans have been diagnosed, and the numbers are increasing (Gradus, 2015).

A focus on PTSD has emerged, increasing awareness among the American people as well as the medical providers caring for the affected population through television programs, movies, plays, books, and social media. Treatment regimens for PTSD include psychiatric counseling/therapy and medications, which present challenges for the individual. Bernardy (2013) examined the negative effects of Benzodiazepine treatment that has widely been used in the U.S. Department of Veteran Affairs (VA) health care system for veterans diagnosed with PTSD. Bernardy concluded that long-term harm outweighs any short-term benefits received from the drug, prompting efforts for safer medication treatments. During a personal communication with a Veteran diagnosed with

PTSD, I discovered a common thread. Veterans do not like taking medications as evidenced by the comment, “I feel like I’m in a fog most of the time and can’t get out, and the therapist does not help me, they only want to give me more pills” (A. G., personal communication, June 6, 2013). With alternative therapies available, veterans like A. G. should have treatment options to choose from aside from traditional therapy and medications.

One intervention that involves a psycho-physiological perspective is neurofeedback. Neurofeedback is a form of neurotherapy that uses electroencephalogram biofeedback to train and improve brain function (Neurodevelopment Center, 2013). Neurofeedback uses heart rate variability to determine the level of stress a person is experiencing and is many times an adjunct in the treatment of PTSD, traumatic brain injury, and other combat injuries and/or stress (PR Web, 2010). Russoniello (as cited in PR Web, 2010) noted that “biofeedback is a learning process in which people are taught to improve their health and performance by observing signals generated by their own bodies” (para. 6). A group entitled Homecoming 4 Veterans (2014) is promoting neurofeedback training (a form of biofeedback) for veterans with PTSD and sharing the positive benefits it allows. Othmer (2012) reported a substantial reduction of depressive symptoms (one of the major symptoms of PTSD) in 4 out of 5 participants. According to Walden University (2018), positive social change is knowingly utilizing information to create change to benefit individuals or communities. Incorporating neurofeedback training into the VA system may have positive social implications for veterans. The use of biofeedback by veterans may increase treatment success while reducing the need for

psychotropic agents. The financial cost to the institution may be decreased when veterans no longer have a need for frequent face-to-face visits for monitoring side effects caused by psychotropic agents. This doctor of nursing practice (DNP) project was conducted to fill the gap in practice by investigating treatments, like biofeedback, that have the potential to improve the quality of life of veterans; reduce the cost and burden of treatment; and provide support to the individual, their family, and their community.

Problem Statement

The Veteran Health Administration has incorporated a patient-centered care concept called Patient Aligned Care Teams (PACTs) that provides "patient-driven, proactive, personalized, team-based care oriented toward wellness and disease prevention resulting in improvements in Veteran satisfaction, improved healthcare outcomes and costs" (VA, 2015, para. 5). RNs are a vital part of PACTs and frequently encounter challenges when attempting to assist veterans being treated with medications for a diagnosis of PTSD. As an RN working in this environment, I frequently interact with veterans diagnosed with PTSD who are on a medication regimen for the disorder. Many times, when trying to educate these veterans about other health care issues, such as hypertension, diabetes, weight loss, or smoking cessation, I encounter a great deal of hesitation and/or pushback related to reported frustration with an inability to remember or deal with the complexities of the PTSD treatment and how it makes them feel (A. G., personal conversation, June 6, 2013). One of the main concerns verbalized is the desire not to have to take the prescribed medications to feel normal again.

Nursing practice includes formulating treatment plans according to evidence-based practice. Formulating a treatment plan for a veteran suffering with PTSD can be difficult due to limitations with disease processes and medication side effects that limit abilities to focus on health education and treatment regimens. Current treatment options are limited to medications and sessions with a therapist. Limiting available treatment choices can create missed opportunities to facilitate functioning without the debilitating side effects of psychotropic drugs. Having available alternative therapies to incorporate into a patient's plan of care may improve the patient's response to PTSD and their quality of life.

By incorporating available evidence, professional judgments, and holistic practice, clinical reasoning can assist in formulating treatment options via biofeedback therapies (Simmons, 2010). The goal of the current project was to identify and synthesize interventional studies to provide evidence of the effectiveness of biofeedback therapy on reducing the need for psychotropic medications in patients with PTSD. An understanding of the effectiveness of alternative treatment for veterans with anxiety and/or depression may encourage further investigation of adjunctive treatment modalities for veterans diagnosed with PTSD.

Purpose

Veterans diagnosed with PTSD receive psychotropic medications and intermittent one-on-one or group therapy sessions. The purpose of the current project was to address the gap in practice by conducting a systematic review of the research related to alternative therapies, such as biofeedback, and their effectiveness in veterans diagnosed

with PTSD. The question guiding this DNP project was the following: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? This systematic review literature was conducted to provide evidence-based practice information to narrow the knowledge-to-practice gap by providing alternative treatment options to reduce the need for psychotropic medications, reduce PTSD symptoms, and improve care plan compliance and understanding among veterans. Findings from this systematic review of the literature may be used to promote awareness of alternative treatment options and encourage additional research on treatment option transformation within the VA health care system for the treatment of PTSD.

Nature of Doctoral Project

The DNP project consisted of a systematic review of current literature addressing available alternative therapies, such as biofeedback therapy, for the treatment of PTSD. Counsell (as cited in Whittemore & Knafl, 2005) defined a systematic review as a method of gathering current information to inform and plan for evidence-based practice initiatives regarding specific clinical issues or concerns. A comprehensive and systematic review of the literature was conducted using the ProQuest Central database. Keywords included *alternative therapies*, *biofeedback treatment*, *post-traumatic stress disorder*, *combat veteran*, and *medications*.

The systematic review methodology detailed by Whittemore and Knafl (2005) was used as a framework for this project. The available research was analyzed and categorized using the Melnyk Pyramid to determine level of evidence (Melnyk &

Fineout-Overholt, 2011). This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by providing alternative options to reduce the need for psychotropic medications without compromising therapeutic effects, improve adherence to treatment options, and increase compliance and understanding as evidenced by an increase in veterans' ability to function in life and verbalize that they feel more like being a part of their family and friend's lives while enjoying themselves.

Significance

Approximately 28.9% of Vietnam veterans (male and female), 12.1% of Gulf War veterans, and 13.8% of Operation Enduring Freedom/Operation Iraqi Freedom veterans have been diagnosed with PTSD, and the numbers are increasing (Gradus, 2015). These percentages translate to over 500,000 Iraq/Afghanistan veterans, who are the newest Veterans across the United States, being diagnosed with PTSD and currently receiving treatment (Gradus, 2015). These increasing numbers strain the medical teams' ability to provide care in an efficient, effective, and timely manner. Results from this systematic review may provide knowledge and resources that may contribute to tools to use in practice for managing combat-related mental health stress disorders. Incorporating alternative therapies, such as biofeedback therapy, into the treatment plan may have implications for positive social change for patients, practitioners, and the health care system.

Access to care in the VA health care system is an ongoing issue as the needs continue to increase, and finding cost-effective treatment options to reduce the burden of frequent outpatient/inpatient visits is crucial. Incorporating alternative cost-effective

therapies, such as biofeedback treatment modalities, into this health care system may allow for improvements in the current combat veteran population who are dealing with mental health stress disorders. In addition, incorporating alternative cost-effective therapies may reduce the need for face-to-face visits, thereby increasing the overall access to care within the system.

Formulating a care plan for a veteran suffering with PTSD can be difficult due to limitations with disease processes and medication side effects that limit the patient's ability to focus on health education and treatment regimens. Having available alternative therapies may allow the nurse to choose from multiple approaches to assist the PACT in developing treatment plans for acute and chronic health conditions. Flexible options can be tailored to each veteran and incorporated into their plan of care to improve the patient's response to PTSD and its effects on quality of life. This approach can be used in the primary care setting and shared within the facility for all levels of direct and indirect care of the veteran. The results of the systematic review may improve local and national level practitioners' knowledge of current evidence-based treatment options for those diagnosed with PTSD, and may support the need for additional research for improvements in PTSD treatment using biofeedback therapy.

Summary

An increasing number of combat-related mental health stress disorders, such as PTSD, has led to an increased demand for treatment in the VA health care system. The increased demands and current treatment efforts for mental health care have the potential to challenge the overall effectiveness of other medical interventions for comorbid

diagnoses, such as hypertension, diabetes, and/or heart disease, due to some of the negative side effects from prescribed mental health medications. Identifying evidence-based alternative treatment options to improve choices may help promote positive outcomes for veterans. A systematic review of the literature was conducted to provide practitioners with evidence-based knowledge to guide decision-making and to generate the impetus for the VA to fund additional research to validate alternative treatment options. Through incorporation of alternative evidence-based treatment regimens that match the needs of the veteran population, the healing process may be improved.

In Section 2, I provide a thorough description of the methods and models used to conduct this project. Additionally, I discuss the project's relevance to nursing practice and how it may affect overall patient outcomes. Lastly, I describe my role as a DNP student in the development of this project.

Section 2: Background and Context

The purpose of this project was to address the practice gap by conducting a systematic review of available literature related to alternative therapies, such as biofeedback, and their effectiveness on veterans diagnosed with PTSD. The goal of this project was to identify and synthesize interventional studies to provide evidence of the effectiveness of biofeedback therapy on reducing the need for psychotropic medications in patients with PTSD. An understanding of the evidence related to the effectiveness of alternative treatment for veterans with anxiety and/or depression may encourage further investigation within the VA's research department on adjunctive treatment modalities for veterans diagnosed with PTSD.

This systematic review may provide evidence-based practice information to narrow the knowledge-to-practice gap by supporting alternative treatment options to reduce the need for psychotropic agents, reduce PTSD symptoms, and improve care plan compliance and understanding. The review included a synthesis of the literature to uncover evidence of the effectiveness of biofeedback therapy for veterans diagnosed with PTSD. Section 2 includes a review of the model, theory, and literature that guided the development of this project. The project focused on information gathered through a systematic review to address the practice gap related to alternative therapies, such as biofeedback, and their use in veterans diagnosed with PTSD.

The question guiding this DNP project was the following: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? This

systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by supporting alternative treatment options to reduce the need for psychotropic medications, reduce PTSD symptoms, and improve care plan compliance and understanding. In Section 3 of this project study, I examine the models and concepts used to guide this review, including the steps, evaluation, and synthesis.

Conceptual Models and Theoretical Frameworks

A theoretical framework provides guidance and direction for the DNP project (Moran, Burson, & Conrad, 2014). Information obtained from evidence-based research is most desirable when attempting to make changes to current practice. The conceptual framework for this project was based on the Iowa model of evidence-based practice to promote excellence in health care (see Titler et al., 2001) as a guide for practice improvement through evidence-based research.

Finding effective options for treatment of PTSD without harmful side effects is a global necessity. The Iowa model is a seven-step process that includes identifying the problem, locating the evidence, and improving practice through the incorporation of evidence-based research (Buckwalter et al., 2017). The seven steps include the following:

1. Identify the triggering issue or opportunity.
2. State the question or purpose.
3. Form a team.
4. Assemble, appraise, and synthesize the body of evidence.
5. Design and pilot the practice change.
6. Integrate and sustain the practice change.

7. Disseminate the results (Buckwalter et al., 2017).

The Iowa model uses a concept of triggers that incorporate a need to make a change based on a known clinical problem. The model includes three key decision points when attempting to make a change:

1. Is there an institutional reason to focus on this problem or use this knowledge?
2. Is there a sufficient research base?
3. Is the change appropriate for adoption in practice? (Gawlinski & Rutledge, 2008, p. 297).

I used Steps 1, 2, and 4 of the Iowa model guided by the first two key decision points to answer the research question: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications?

I formulated a plan to assemble, appraise, and synthesize the body of evidence relating to alternative treatments for PTSD to present to the leaders/decision-makers at the medical center. The decision to use Stages 3, 5, 6, and 7 of the Iowa model will be made by the leaders and decision-makers at the medical center. My research question guided the decision points of the Iowa model through the development of this literature review. Reviewing the history of PTSD, as well as the current literature, was intended to determine the most effective treatment modalities to incorporate into the VA for the veteran population. I reviewed studies to identify alternative treatment options for PTSD and how they may affect the use of medications for the disorder.

The Iowa model is a user-friendly model allowing health care professionals to determine the need for change in practice and develop effective changes using evidence-based literature (Buckwalter et al., 2017). Nurses are known for using tradition statements like “that’s how we’ve always done it” or “if it’s not broke don’t fix it.” The concern lies with advancements that frequently occur in the health care arena. The Iowa model provided a structure to uncover a need for change through identified practice gaps, systematically review the available evidence, educate the shareholders, and implement the change (see Hanrahan et al., 2015).

Brown (2014) discussed how the Iowa model was used to translate research into practice to improve outcomes for oncology patients. The concern was for stem cell transplant patients sustaining a high rate of falls while inpatient for transplantation. Studies were retrieved, reviewed for relevance, and utilized to make a practice change that produced positive improvements in patient outcomes.

There are numerous examples of the positive aspects of organizational practice change through use of the Iowa model. The model includes a user-friendly algorithm allowing input from the organizational system involving nurses at every level. An important aspect of the model is the use of a practice change trial prior to implementation into practice (Schaffer, Sandau, & Diedrick, 2013). Organizational input at every level allows for buy-in to implement the change when appropriate.

Relevance to Nursing Practice

Health care for the veteran population may prove challenging due to the complexity of combat-related mental health disorders. Improvements in health outcomes

may vary depending on the choice of treatment for the disease. Veterans diagnosed with PTSD and undergoing treatment via combined medication and therapy verbalized difficulty with remembering and/or adhering to a treatment regimen for other health care issues and an effect on their overall quality of life (A.G., personal communication, June 6, 2013).

Formulating care plans for a veteran with PTSD can be difficult due to limitations from disease processes and medication side effects that limit abilities to focus on health education and treatment regimens (Howlett & Stein, 2016). Alternative therapies, such as biofeedback, to incorporate into a patient's plan of care have the potential to improve the patient's response to PTSD and its effects on quality of life. Complementary and alternative medicine (CAM) therapies include medical products or practices that are not standard, such as massage, acupuncture, yoga, tai-chi, and biofeedback. Trail-Mahan, Mao, and Bawel-Brinkley (2013) investigated the average knowledge of CAM in hospital-based nurses. The results revealed an average baseline knowledge of CAM of approximately 51%, which the researchers concluded was a poor score and recommended the need for additional CAM-related nursing education. Many nurses support CAM therapies; however, they do not have a baseline knowledge of what they entail. CAM education may provide the nurse with the knowledge to educate and assess the patient's response to alternative options for pain control. Employer-based CAM nursing education offers baseline knowledge, along with strong support from the employer, to incorporate CAM therapies into the patient's care plan, leading to a more holistic approach to patient care.

The use of CAM therapy significantly improved health-related quality of life and symptoms associated with chemotherapy treatment in female patients diagnosed with breast and gynecological cancer undergoing chemotherapy (Klafke et al., 2015). Henneghan and Schnyer (2013) discussed using CAM therapies in hospice and palliative care settings to improve health care quality of life and ease the negative effects of end of life. Specifically mentioned were biofield therapies (e.g., therapeutic touch, healing touch, and reiki), which are noninvasive and easy to learn by health care workers and family members, and which offering a holistic approach overlapping with the hospice and palliative care philosophies for end-of-life care (Henneghan & Schnyer, 2013). CAM therapies allow patients a sense of control over their pain and end-of-life anxiety. Henneghan and Schnyer (2013) conducted a literature review that indicated no studies were conducted on CAM therapy for hospice patients. The findings suggested high levels of therapeutic response for patients in significant pain and the need to study hospice patients to determine the need for better end-of-life quality of life (Henneghan & Schnyer, 2013).

Nursing is a caring profession with patients at the center of the goals and philosophies. Current PTSD treatment options include medications, group therapy, and individual therapy, which are not holistically beneficial and cause negative side effects with quality of life. Using CAM therapies as adjuncts to traditional nursing care may allow for positive outcomes while reducing negative side effects. Biofeedback therapy for veterans diagnosed with PTSD may assist with the patient's response to PTSD and its effects on quality of life.

Local Background and Context

The subject matter was veterans diagnosed with PTSD and the current treatment options versus alternative options discovered through a systematic review of the literature. The veterans treated for PTSD in the VA health system are of all ages of adulthood. Veterans include men and women trained for combat readiness alongside their comrades during long periods of strict cohesiveness and regimented attention to the finest of details. Once exposed to the perils of war, these men and women may feel broken with a sense of bereavement as they adjust to loss of self-identity and a significant change in returning to life as a civilian (Mobbs & Bonanno, 2017). Veterans diagnosed with PTSD verbalized to me their discontent with the negative side effects from medications used to treat PTSD. Veterans undergoing treatment via combined medication and therapy reported difficulty remembering and/or adhering to a treatment regimen for other healthcare issues; this had an effect on overall quality of life (A.G., personal communication, June 6, 2013). Receiving treatment for PTSD requires frequent medical appointments for medication follow-up and therapy. Access to care in the VA health care system is an ongoing issue, and finding effective treatment options to reduce the need for frequent outpatient/inpatient visits is a nationwide desire. Recently, the Veterans Health Administration treated 702,590 veterans diagnosed with PTSD in both inpatient and outpatient settings across the United States (VA, 2017). These numbers strain the medical teams' ability to provide effective, efficient, and timely care.

Heart rate variability (HRV) is a form of biofeedback therapy that allows a person, through personal visualization, to learn how stressors effect the way their heart

responds. The biofeedback learning tools allow the person to practice control over the heart rate changes and better control their response to stress. A review of how HRV has transpired from an unknown variable to a key piece of evidence was conducted by Wheat and Larkin (2010). Analysis included the difference between low and high HRV and how it can affect a person's susceptibility to disease processes. Examples of low HRV and its outcomes included cardiac disorders, fibromyalgia, hypertension, neuropathy, depression, anxiety, and PTSD. Developing a treatment to combat these unwanted conditions has become necessary. Wheat and Larkin (2010) performed a literature review to determine the efficacy of using biofeedback and HRV to treat conditions by regulating heart rate. The review revealed encouraging results showing modifiable HRV parameters through the use of biofeedback; however, further studies are needed to provide more exact determinations.

A review of the effectiveness of biofeedback as a CAM for PTSD was reported by Lande, Williams, Francis, Gragnani, and Morin (2010). These authors found that patients can identify and learn how to uncover an awareness of typically subliminal PTSD triggers using biofeedback. Lande et al. identified that when individuals master the biofeedback technique, the impact of each previously difficult trigger becomes less. Participants reported that the use of biofeedback and HRV was a stress reducer; however, the participants did not report that it reduced their PTSD symptoms. The pilot study with an exploratory design had a limitation of time. Future studies were recommended with longer timeframes because this study only continued for 3 weeks, limiting potential positive outcomes.

Tan, Dao, Farmer, Sutherland, and Gevirtz (2011) conducted a pilot study to determine whether HRV was more depressed in veterans with PTSD compared to veterans without PTSD. Tan et al. questioned whether introducing HRV biofeedback would positively impact veterans with PTSD. Tan et al. utilized both the clinician-administered PTSD scale (a 30-item structured interview) and the PTSD checklist-specific (17 items corresponding to the DSM-IV symptoms of PTSD) as interview questions to determine whether a diagnosis of PTSD existed. Twenty participants diagnosed with PTSD were randomly assigned to one of two groups. The experimental group received HRV BF in addition to treatment as usual (medications, therapy, etc.), and the control group received treatment as usual. The experimental group received eight weekly sessions of 30-minute HRV BF. Preliminary results showed an 18% clinician-administered PTSD scale score reduction in the experimental group compared to a 9% in the control group. Although results were promising, Tan et al. suggested further research with a larger group with coupling variables to confirm the efficacy of the intervention.

Veterans seeking mental health treatment through the VA health care system have a history of having to wait long periods of time before receiving treatment. The VA issued a mandate requiring that non-urgent mental health patients are seen within 30 days of the request for care, and urgent or emergent veterans are seen on the same day of presentation to a facility requesting assistance (VA, 2019). Incorporating alternative therapies, such as biofeedback therapy into the treatment plan may reduce the need for face-to-face visits, thereby increasing the available access to care within the system.

Role of DNP Student in Project

As a doctorally prepared nurse, formulating a plan to translate evidence into practice will better align a current problem with a potential solution. According to the American Association of Colleges of Nursing (AACN, 2018), a practice based doctoral degree in nursing is used to incorporate evidence-based research into practice in lieu of developing new evidence. In my current role as a registered nurse working in an outpatient setting within the VA health care system, incorporating available evidence-based research into practice is on the forefront for improving health outcomes and quality of life for our veterans.

My doctoral project was initiated based on inspiration from personal conversations and experiences with veterans in my daily practice. Participating with an outreach team at a local university's biofeedback lab during my practicum, sparked my interest for possible treatment interventions for veterans diagnosed with PTSD. This experience led me to investigate evidence-based alternative practices that have the potential to improve the health outcomes and quality of life for veterans with PTSD.

An area of potential bias for me included preconceptions that incorporating biofeedback treatments into the VA would be an easy task based on positive results I witnessed in the biofeedback lab. These biases have the potential to steer me towards only positive result findings. Decreasing bias for this project is important, as my goal is to uncover accurate data through a thorough literature review and not base the information presented solely on the outcomes I desire. A second potential bias for this project, is my proximity as a clinical nurse working in the VA to the veterans diagnosed

with PTSD. I removed any potential bias by objectively reviewing the information and maintaining awareness of potential factors that may influence my view and a personal desire for positive outcomes. Critically identifying and examining a broad array of evidence-based resources to incorporate into the systematic review, will help to inform best clinical practice related to biofeedback therapies for the treatment of PTSD.

Summary

In summary, this systematic review will provide evidence-based practice information to narrow the knowledge-to-practice gap by answering the question guiding this project; "will utilizing alternative therapy, such as biofeedback therapy in veterans diagnosed with post-traumatic stress disorder (PTSD) improve the therapeutic response and reduce the need for psychotropic medications." The Iowa model will guide my identification of evidence-based information related to biofeedback as an effective treatment option for veterans with PTSD. Aligning the current problem and gap in practice with evidence related to the effectiveness of biofeedback for PTSD, have the potential to increase available treatment options for veterans and improve their quality of life. I will utilize steps 1, 2, and 4 of the Iowa model guided by its first two key decision points to answer my research question. The Iowa model is a user-friendly model allowing health care professionals to determine the need for change in practice, as well as develop effective changes using evidence-based literature (Buckwalter et al, 2017). A discussion of relevance to nursing practice depicted the use of alternative therapies as adjuncts to traditional therapies when developing patient care plans. Nursing is a caring profession with patients at the center of the goals and philosophies. Utilizing complementary and

alternative medicine therapies as adjuncts to traditional nursing care can allow for positive outcomes while reducing many negative side effects. My goal as a as a doctorally prepared nurse is to translate evidence into useable practice that will align with a current health problem. Finding effective treatment options to reduce the need for frequent outpatient/inpatient visits is a nationwide desire. An ability to incorporate alternative therapies, such as biofeedback therapy into the treatment plan will reduce the need for face-to-face visits, thereby increasing the overall access to care within the system. In section 3, I will discuss the practice-focused question, search methodologies, and standards used to appraise, analyze, summarize, and synthesize studies.

Section 3: Collection and Analysis of Evidence

In this section, I discuss the practice-focused question, search methodologies, and standard used to appraise, analyze, summarize, and synthesize studies. Nursing practice includes formulating treatment plans according to evidence-based practice. Formulating a treatment plan for a veteran suffering with PTSD can be difficult due to limitations with disease processes and medication side effects that limit abilities to focus on health education and treatment regimens. Having available alternative therapies to incorporate into a patient's plan of care may help to improve the patient's response to PTSD and its effects on quality of life. By incorporating available evidence, professional judgments, and holistic practice, clinical reasoning can assist in formulating treatment options via biofeedback therapies (Simmons, 2010).

The purpose of this project was to conduct a systematic review of literature related to the use of alternative therapies, such as biofeedback, and their use in veterans diagnosed with PTSD. This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by recommending alternative treatment options to reduce the need for psychotropic medications, reduce PTSD symptoms, and improve care plan compliance and understanding.

Practice-Focused Questions

Access to care in the VA health care system is an ongoing issue, and finding cost-effective treatment options to assist with reducing the burden of frequent outpatient/inpatient visits is crucial. The purpose of this project was to address the knowledge-to-practice gap by answering the following question: Will utilizing alternative

therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? I addressed the practice gap by conducting a systematic review of literature related to alternative therapies, such as biofeedback, and their use in veterans diagnosed with PTSD.

Results from this systematic review may increase knowledge and resources in managing combat-related mental health stress disorders. Incorporating alternative cost-effective therapies, such as biofeedback treatment modalities, into this health care system may improve the therapeutic response of combat veterans who are dealing with mental health stress disorders. In addition, alternative therapies may reduce the need for face-to-face visits, thereby increasing the overall access to care within the system. Incorporating alternative therapies, such as biofeedback therapy, into the treatment plan may affect positive social change for patients, practitioners, and the health care system.

Formulating a care plan for a veteran suffering with PTSD can be difficult due to limitations with disease processes and medication side effects that limit the patient's ability to focus on health education and treatment regimens. Having available alternative therapies to incorporate into the plan of care may improve the patient's response to PTSD and its effects on quality of life. The results of the systematic review may improve practitioners' knowledge of current evidence-based treatment options available for those diagnosed with PTSD and may support additional research for improvements in PTSD treatment using biofeedback therapy.

Sources of Evidence

This project started with conversations between me and veterans receiving treatment for PTSD. Veterans diagnosed with PTSD verbalized to me their discontent with the negative side effects from the medications used to treat PTSD. Veterans undergoing treatment via combined medication and therapy reported difficulty remembering and/or adhering to a treatment regimen for other healthcare issues; this was affecting their overall quality of life (A.G., personal communication, June 6, 2013). This review provided information on biofeedback, an alternative treatment modality for PTSD, along with counseling and medications. A comprehensive and systematic review of the literature was conducted using the electronic database ProQuest Central to provide access to scholarly journals and references, as well as historical primary sources and electronic books to simplify literature searching to one primary location. The literature search includes the following keywords: *alternative therapies*, *biofeedback treatment*, *post-traumatic stress disorder*, *combat Veteran*, and *medications*.

The literature was analyzed and categorized using the Melnyk Pyramid to determine level of evidence (see Melnyk & Fineout-Overholt, 2011). This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by providing alternative options to reduce the need for psychotropic medications without compromising therapeutic effects, improve adherence to treatment options, and improve compliance with and understanding of care plans. Incorporating the evidence in practice may increase health care practitioners' treatment options, which may lead to positive outcomes including improved quality of life for veterans.

Analysis and Synthesis

Upon receipt of the Walden University Institutional Review Board approval number 12-13-19-0165217, I conducted an electronic literature search of available treatment options for veterans diagnosed with PTSD. I chose ProQuest Central for my search to allow access to scholarly journals and references, as well as historical primary sources and electronic books to simplify literature searching to one primary location. Every article identified was reviewed for appropriateness to the topic. Once identified, articles were placed in categories according to their significance to the topic and level of evidence. Determination of level of evidence for this process of inquiry was completed using Melnyk and Fineout-Overholt's (2011) rating system for the hierarchy of evidence. This system consists of seven levels of evidence, with Level I being the strongest and Level VII being the weakest. Choosing articles that were categorized in the top two levels of evidence ensured efficacy of the data and provided appropriate information for further research efforts. Inclusion parameters were publication in the last 6 years (2012-2018), peer-reviewed academic journals, veterans and nonveterans with PTSD, and articles written in English. Exclusion criteria were articles that did not include information specific to treatment options for PTSD, concept-based articles, and repetitive articles. All articles were maintained in an electronic system for tracking purposes and organization. Once organized by date and level of evidence, the information was extracted and synthesized to assist with narrowing the knowledge-to-practice gap.

Summary

This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by answering the question guiding this project: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? The results of the systematic review supported the need for additional research for improvements in PTSD treatment using biofeedback therapy. ProQuest Central provided a comprehensive resource for conducting a systematic review of the literature using the Melnyk Pyramid to determine the strongest level of evidence to assist with narrowing the knowledge-to-practice gap.

Section 4: Findings and Recommendations

In this section, I discuss the findings and implications, recommendations, and strengths and limitations of the project. Nursing practice includes formulating treatment plans according to evidence-based practice. Formulating a treatment plan for a veteran suffering with PTSD can be difficult due to limitations with disease processes and medication side effects that limit abilities to focus on health education and treatment regimens. Having alternative therapies to incorporate into a patient's plan of care may help to improve the patient's response to PTSD and its effects on quality of life. By incorporating available evidence, professional judgments, and holistic practice, clinical reasoning can assist in formulating treatment options via biofeedback therapies (Simmons, 2010).

Access to care in the VA health care system is an ongoing issue, and finding cost-effective treatment options to assist with reducing the burden of frequent outpatient/inpatient visits is crucial. The purpose of this project was to address the knowledge-to-practice gap by answering the following question: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? I addressed the practice gap by conducting a systematic review of literature related to alternative therapies, such as biofeedback, and their use in veterans diagnosed with PTSD. Steps 1, 2, and 4 of the Iowa model were used as a framework for this review, guided by the first two key decision points of the model. The available research was analyzed and categorized using the Melnyk Pyramid to determine level of evidence (see Melnyk &

Fineout-Overholt, 2011). This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by providing alternative options to reduce the need for psychotropic medications without compromising therapeutic effects, improve adherence to treatment options, and improve compliance with and understanding of care plans. Incorporating the evidence in practice may increase health care practitioners' treatment options, which may lead to positive outcomes including improved quality of life for veterans.

Sources of evidence were acquired from a comprehensive and exhaustive literature review. After applying the inclusion and exclusion criteria to 389 identified articles, 86 were deemed relevant based on title review and were critically reviewed for appropriate content and categorized by level of evidence using the Melnyk pyramid (see Melnyk & Fineout-Overholt, 2011). Of the 86 articles, 6% (five studies) were deemed admissible based on appropriate content and level of evidence. Two studies were rated as Level I, and three studies were rated as Level II using Melnyk's pyramid. I did not feel this was enough evidence, so I broadened my search using only the keywords *biofeedback* and *Post-Traumatic Stress Disorder*. The search retrieved 346 articles, of which 52 were deemed relevant based on title review and were critically reviewed for appropriate content and categorized by level of evidence using the Melnyk pyramid. Of the 52 articles, 19% (10 studies) were deemed admissible based on appropriate content and level of evidence. Four studies were rated as Level I and six studies were rated as Level II using Melnyk's pyramid.

Results from this systematic review provided knowledge and resources to use in practice for managing combat-related mental health stress disorders. Incorporating alternative therapies, such as biofeedback therapy, into the treatment plan may have implications for positive social change for patients, practitioners, and the health care system.

Findings and Implications

I organized my literature based on two subquestions that addressed trends and commonalities to better understand pros and cons for biofeedback therapy. The synthesized studies established the foundation of my findings and included two systematic reviews and meta-analysis combined studies, two meta-analysis studies, two systematic reviews, and nine randomized controlled trials.

Did Biofeedback Therapy Have Positive Therapeutic Response?

Studies were deemed successful if they showed a positive response by reducing the severity of PTSD symptoms. Of the 15 studies reviewed, only one showed questionable evidence in which no significant effects were seen in the studied group compared to the control group (see Petrowski et al., 2016). I deemed this study a negative response for my purposes. Thirteen of the identified studies indicated positive outcomes for PTSD using several different biofeedback options as forms of therapy.

Khan et al. (2018) found that eye movement desensitization and reprocessing (EMDR), a form of biofeedback, was substantially better than cognitive behavioral therapy in reducing PTSD symptoms. Acarturk et al. (2016) studied the effects of EMDR for PTSD symptoms among Syrian refugees and found that EMDR alleviated PTSD

symptoms among the refugees. Acarturk et al. recommended future studies to determine long-term effects.

Schoenberg and David (2014) evaluated the cost effectiveness and overall benefit of biofeedback therapy through a systematic review and found a significant reduction in overall cost of therapy and PTSD symptoms using biofeedback. Koven (2018) found several alternative based treatment options, such as biofeedback therapies, showed a significant increase in the reduction in PTSD symptoms. Peira, Pourtois, and Fredrikson (2013) discussed how learned heart rate regulation using biofeedback can be achieved and transferred to emotional or stressful situations without the use of biofeedback, thereby reducing the potential negative effects of stress on the body. Kotozaki et al. (2014) discussed biofeedback for stress management and found biofeedback therapy was effective against the gray matter structures in the brain that were vulnerable to stress. Janka, Adler, Brunner, Oppenrieder, and Duschek (2017) discussed biofeedback training use with crisis managers. The findings indicated a significant reduction in stress, stress-related performance decline, and stress-related disease.

Sargent, Campbell, Richter, McLay, and Koffman (2013) discussed CAM therapies and discovered a small evidence base for CAM as a stand-alone therapy. Jain et al. (2012) discussed the use of CAM treatments in active duty military members with PTSD. Study findings showed a significant reduction in PTSD and related symptoms. Additional studies were recommended with a goal of mitigating PTSD.

Goessl, Curtiss, and Hofmann (2017) conducted a meta-analysis review and concluded that HRV biofeedback is effective at reducing anxiety and stress; however,

Goessl et al. recommended additional studies to include a more clinically based population. Monti et al. (2017) discussed using the neuro emotional technique intervention in patients with traumatic stress symptoms. Findings were positive for reducing the brain's response to traumatic memories by allowing the person to self-regulate their emotions. Monti et al. recommended additional larger scale studies to quantify findings. Van der Kolk et al. (2016) discussed neurofeedback training in patients with chronic PTSD. Study findings showed significant symptom reduction in people with PTSD. The recommendation was for additional investigation for the potential to ameliorate PTSD. Lu et al. (2017) discussed the effects of neurofeedback therapy on anxiety and physical symptoms in patients with panic disorder. The results showed a significant reduction in panic symptoms with the use of neurofeedback therapy over routine care (see Table 1).

Table 1

Did Biofeedback Therapy Have a Positive Therapeutic Response?

Type of therapy	Results
Eye movement desensitization and reprocessing (EMDR)	1. Significantly better than cognitive behavioral therapy in reducing PTSD symptoms (Khan et al, 2018) 2. Used with Syrian refugees – alleviated PTSD symptoms. Recommended future studies to determine long term effects (Acarturk et al, 2016)
Biofeedback (global measures)	1. Significant cost savings and reduction in PTSD symptoms (Schoenberg and David, 2014) 2. Significant reduction in PTSD symptoms (Koven, 2018) 3. Learned heart rate regulation used to reduce response to emotional or stressful situations (Peira, Pourtois, and Fredikson, 2013) 4. Biofeedback for stress management – effective against gray matter structures in the brain vulnerable to stress (Kotozaki et al, 2014) 5. Use with crisis managers; showed significant reduction in stress, stress elated performance decline, and stress related disease (Janka et al, 2017)
Complementary and alternative medicine (CAM) (global measures)	1. Small evidence for improvement in PTSD symptoms with stand-alone therapy (Sargent et al, 2013) 2. CAM in active duty military with PTSD; significant reduction in PTSD symptoms – Recommend additional studies (Jain et al, 2012)
Heart rate variability	1. Reduces anxiety and stress; Recommends additional studies geared towards a clinically based population (Goessl, Curtis, & Hofmann, 2017)
Neuoremotional technique (NET)	1. Reduced the brain's response to traumatic memories and allows self-regulation of emotions. Recommends additional larger scale studies (Monti et al, 2017)
Neurofeedback (global measures)	1. Significant reduction in PTSD symptoms; Recommends additional studies (Van der Kolk et al, 2016) 2. Significant reduction in panic symptoms using neurofeedback over routine care (Lu et al, 2017)

Note. Listing of several different biofeedback-related therapy options and the study findings.

Did Biofeedback Therapy Reduce the Need for Psychotropic Medications?

Studies were deemed successful if they showed a positive response by reducing the need for psychotropic medications for PTSD symptom management. I was unable to identify any studies that addressed biofeedback therapy and its relation to reducing the need for psychotropic medications. Alvares, Quintana, Hickie, and Guastella (2014) found a significant reduction in HRV with many psychiatric disorders and identified that tricyclic antidepressants and clozapine can further reduce HRV leading to an increased risk for cardiovascular disease and worsening additional comorbidities for the patient with PTSD. Sargent et al (2013) did not specify a reduction in a need for psychotropic medications; however, when CAM therapies were augmented with exposure-based therapies or pharmacotherapy options, treatment compliance improved (see Table 2).

Table 2

Did Biofeedback Therapy Reduce the Need for Psychotropic Medications?

Type of therapy	Results
Heart rate variability (HRV)	1. Noted reduction in HRV with many psychiatric disorders. Tri-cyclic anti-depressants and clozapine can further reduce the HRV leading to an increased risk of cardiovascular disease and worsening comorbidities (Alvares et al, 2014)
Complementary and alternative medicine (CAM)	1. Study did not specify a reduction in the need for psychotropic medications; however, when CAM was augmented with exposure-based or pharmacotherapy options, treatment compliance improved (Sargent et al, 2013)

Note. Biofeedback therapies and how they related to the need for psychotropic medications.

Discussion of Findings

This systematic review of the literature was an important step in moving forward with adding treatment options for PTSD in the veteran population. Most of the studies included groups with 25 or fewer participants who ranged in age from 18 to 66 years. Studies were focused on civilian and military members with PTSD and/or other mental health diagnoses like anxiety. Several benefits were identified in studies showing significant reductions in PTSD symptoms. Studies addressed several types of biofeedback-based therapy options, such as EMDR, biofeedback (global measures), CAM (global measures), HRV, neuroemotional technique, and neurofeedback (global measures). All therapy options resulted in positive outcomes related to reducing

symptoms of PTSD. Additional studies need to be conducted with a focus on the veteran population and how biofeedback therapy can reduce the need for psychotropic medications.

Available studies offered a great deal of promise for positive changes in treatment options with improvement in patient compliance and a possible reduction in negative side effects. Alternative therapies will allow the nurse to choose from multiple approaches to assist the PACT in developing treatment plans for acute and chronic health conditions. Flexible options can be tailored to each veteran and incorporated into their plan of care to improve their response to PTSD and its effects on quality of life. This approach can be used in the primary care setting and promoted within the facility for all levels of direct and indirect care of the veteran. The results of this review may improve local and national level practitioners' knowledge of current evidence-based treatment options available for those with a diagnosis of PTSD and may support the need for additional research for improvements in PTSD treatment using biofeedback therapy.

Recommendations

Biofeedback therapy has great potential as an effective treatment option for veterans with PTSD. Evidence indicated positive outcomes with possible elimination of the negative effects of the disease. The evidence base is not as extensive as with more traditional treatment options but is promising, nonetheless. Biofeedback treatment offers veterans a sense of autonomy and empowerment and may increase treatment compliance due to ease of use and a possible reduction in the need for ongoing traditional treatment options like cognitive behavioral therapy and psychotropic medications (see Sargent et

al., 2013). Alternative treatment options like biofeedback therapy remain in an early developmental state within the VA health care system. I recommend additional research on the immediate and long-term effects of biofeedback therapy as both individual and adjunctive therapies and how it effects veterans with PTSD. Additional studies may increase the knowledge base of alternative treatment options to assist with reducing or eradicating this difficult disease. An infographic of current available treatment options can be produced and disseminated to practitioners throughout the VA system.

Strengths and Limitations

Strengths of this project included an extensive and systematic review of the available evidence, which included studies identified using the highest levels of evidence. Although the search was extensive, the search range was limited from 20l2 to 2018 to ensure the most current information. Limitations included a lack of evidence regarding whether biofeedback therapy will reduce the need for psychotropic medications in veterans with PTSD. Additionally, all articles were chosen by me and not cross-checked by a second researcher. Data were extracted from each article by me, which may have limited the reported data based on my interpretation. The extracted data were heterogenous as it pertains to biofeedback types, population, and measured outcomes needed to recommend clinical change.

Future projects are limitless. One future study may include using data discovered from current literature, as well as extracted data from future studies to provide a means towards a preventive mindset. Utilizing biofeedback knowledge and tools to educate and train military members at the onset of inception may improve the member's response to

stressful situations and reduce or eliminate the onset of PTSD. This project may require several years to complete but may provide significant positive outcomes towards reducing the need for psychotropic medications or a goal of complete eradication.

Section 5: Dissemination Plan

My plan is to disseminate this information locally via PowerPoint presentation to the leadership team at the local VA health care facility with a recommendation for additional research on the immediate and long-term effects of biofeedback therapy as both individual and adjunctive therapies. Additionally, the presentation will be available to other VA facilities who may have an interest in conducting research at their local or nationally based levels. I will also conduct a poster presentation on the positive effects of biofeedback therapy to share at a nursing conference in late 2020. The implications for positive social change are considerable, as is the need for additional research. Making clinical changes based on evidence has a potential for significant improvement in outcomes.

Analysis of Self

Practitioner

This DNP project has helped to develop the practitioner I am today. I have grown in knowledge and capability and have discovered how to interpret and understand evidence-based research. As a practitioner in a busy primary care practice, I have developed an interest in the latest evidence to better care for my patients. I have vowed to ensure adequate research using credible sources to back up my knowledge base prior to making changes to how I care for my patients. I have also learned the importance of maintaining compliance with the most up-to-date guidelines to ensure I am practicing the most accurate standards of care. I have experienced an increased interest in social change

and have developed an internal sense of empowerment to educate colleagues and patients on evidence-based information with a goal of change and positive health outcomes.

Scholar

As a scholar, I am confident in my abilities to appraise available literature using tools I have learned through this DNP process. Through advancing my education and working hard, I have expanded my ability to offer improved evidence-based care for my patients. Advanced scholarship influences change, and I feel I am better prepared to be the change agent I desire to be. As a scholar, I must remain vigilant in my learning and stay up to date with research and guidelines that may impact my practice and the care of my patients.

Project Manager

As a project manager, I had to remain on task and stay focused to remain on schedule with my personal timeline. Life tends to get in the way and causes unforeseen delays that lead to difficulty meeting deadlines. I found it important to maintain emotions and seek spiritual guidance to get back on track. I have never been one to stand out or make my voice heard. I lacked confidence and have tended to remain in the background. This DNP process has taught me to embrace the knowledge and speak up for what I know, and that evidence-based information is a powerful tool.

Throughout this doctoral process, I have learned the importance of maintaining clear-cut guidelines to reach my goals but to not be hard on myself when tasks do not happen on a schedule as initially planned. I have developed a greater sense of patience with things beyond my control and have learned to not sweat the small stuff. I am forever

grateful for this process and the skills I have learned as I feel I am a better provider because of it.

Summary

This systematic review provided evidence-based practice information to narrow the knowledge-to-practice gap by answering the question guiding this project: Will utilizing alternative therapy, such as biofeedback therapy, in veterans diagnosed with PTSD improve the therapeutic response and reduce the need for psychotropic medications? A comprehensive and systematic review of the literature was conducted using the single source electronic database ProQuest Central using keywords *alternative therapies*, *biofeedback treatment*, *post-traumatic stress disorder*, *combat Veteran*, and *medications*, along with the Iowa model as a guide to identify evidence-based information. The literature was analyzed and categorized using the Melnyk Pyramid to determine level of evidence. The synthesized studies included two systematic reviews and meta-analysis combined studies, two meta-analysis studies, two systematic reviews, and nine randomized controlled trials.

Evidence indicated positive outcomes regarding reduction or elimination of the negative effects of PTSD. Biofeedback treatment offers veterans a sense of autonomy and empowerment, may increase treatment compliance due to ease of use, and may reduce the need for ongoing traditional treatment options like cognitive behavioral therapy and psychotropic medications. I recommend additional research on the immediate and long-term effects of biofeedback therapy as both individual and adjunctive therapies and how it effects veterans with PTSD.

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