Qualitative Research

Exploring Self-Reported Benefits of Auricular Acupuncture Among Veterans With Posttraumatic Stress Disorder

jhn

Journal of Holistic Nursing
American Holistic Nurses Association
Volume XX Number X
XXXX 201X 1–9
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10.1177/0898010115610050
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Purpose: Auricular acupuncture treatments are becoming increasingly available within military treatment facilities, resulting in an expansion of nonpharmacologic treatment options available to veterans with posttraumatic stress disorder (PTSD). This study aimed to explore the self-reported benefits of auricular acupuncture treatments for veterans living with PTSD. **Design:** A qualitative research methodology, thematic content analysis, was used to analyze data. **Method:** Seventeen active duty veterans with PTSD provided written comments to describe their experiences and perceptions after receiving a standardized auricular acupuncture regimen for a 3-week period as part of a pilot feasibility study. **Findings:** A variety of symptoms experienced by veterans with PTSD were improved after receiving auricular acupuncture treatments. Additionally, veterans with PTSD were extremely receptive to auricular acupuncture treatments. Four themes emerged from the data: (1) improved sleep quality, (2) increased relaxation, (3) decreased pain, and (4) veterans liked/loved the auricular acupuncture treatments. **Conclusions:** Veterans with PTSD reported numerous benefits following auricular acupuncture treatments. These treatments may facilitate healing and recovery for veterans with combat-related PTSD, although further investigations are warranted into the mechanisms of action for auricular acupuncture in this population.

Keywords: *posttraumatic stress disorder; auricular acupuncture; Veterans*

Posttraumatic stress disorder (PTSD) has emerged as a significant problem among Operation Enduring Freedom/Operation Iraqi Freedom veterans. This disorder will affect approximately 9% to 24% of veterans returning from Operation Enduring Freedom and Operation Iraqi Freedom and is generally defined by the presence of characteristic symptom clusters (Wells et al., 2011). PTSD symptom clusters include intrusion, avoidance, negative alterations in cognition/mood, and alterations in arousal and reactivity following exposure to a traumatic event (American Psychiatric Association, 2000). Expression of these symptoms varies greatly among veterans diagnosed with PTSD, and frequently overlaps with symptoms of other comorbid conditions. Anxiety, depression, sleep disturbances, daytime fatigue, sexual dysfunction, chronic pain, substance

Authors' Note: The authors would like to gratefully acknowledge the TriService Nursing Research Program for funding this project (Grant No. HT9404-12-1-TS15). The views expressed in this article are the authors and do not necessarily reflect the official policy of the Department of the Navy, Department of Defense, or the U.S. government. Please address correspondence to CDR Heather C. King, NC, USN, PhD, CRNA, Naval Medical Center San Diego, 34800 Bob Wilson Dr., San Diego, CA 93134; e-mail: heather.c.king.mil@mail.mil.

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abuse, suicidal ideation, and impaired physical and social function are comorbid conditions highly prevalent among veterans with PTSD (American Psychiatric Association, 2013). This combination of both PTSD and comorbid conditions has been referred to as the trauma spectrum response, and can contribute to the complex and vulnerable nature of veterans with PTSD (Lee et al., 2012). This presence of multiple symptoms can present significant challenges to provide effective treatments for veterans with PTSD.

Current treatment approaches for PTSD are often based in a conventional biomedical model, which relies on the use of medications and the delivery of highly specialized medical treatments for comorbid conditions separately. However, this model has been limited in its ability to provide comprehensive collaborative care to veterans (Lee et al., 2012). In an effort to improve care provided to veterans with PTSD, the Department of Defense recently began to implement and actively support the use of complementary and alternative medicine (CAM) treatments within military treatment facilities (MTFs). One CAM treatment that has been particularly well received among veterans with PTSD is auricular acupuncture. Auricular acupuncture is a specialized form of acupuncture in which acupuncture needles are placed at specific locations on the external auricle to produce an effect. Auricular acupuncture within MTFs has been used to supplement conventional first-line treatments for PTSD. This integrative approach for veterans with PTSD is attractive within military settings because auricular acupuncture promotes a holistic approach to patient care, has minimal side effects, is a low-cost treatment, and potentially avoids the stigma of receiving mental health care services. Furthermore, auricular acupuncture can be administered by nurses within MTFs, after a brief course of training. This training not only expands the clinical role of registered nurses but also increases the availability of this nonpharmacologic treatment to veterans.

Given the critical need to discover and implement additional treatments to manage the numerous symptoms veterans with PTSD experience, further research is needed to explore how auricular acupuncture treatments may benefit this population. Therefore, the purpose of this study was to explore the self-reported benefits of veterans with PTSD who received a 3-week auricular acupuncture regimen.

Background

Auricular acupuncture has historical and philosophical roots in traditional Chinese medicine (TCM). TCM views individuals from a holistic perspective which considers body, mind, spirit, emotion, environment, energy (*qi*), and the balance of forces (*yin* and *yang*) as components of health and disease. These concepts are aligned with the dimensions of the holistic nursing perspective as defined by the American Holistic Nurses Association, which considers the body, mind, emotion, spirit, social/cultural, relationship, context, and environment when caring for patients (Dossey, 2010). Given the overlap in TCM and the holistic nursing perspective, it is not surprising that auricular acupuncture treatments and variations of auricular therapies such as auricular acupressure have become increasingly accepted, practiced, and investigated by nurses in both Eastern and Western health care settings (Bergdahl, Berman, & Haglund, 2014; Do Prado, Kurebayashi, & da Silva, 2012; Suen & Wong, 2008; Suen, Wong, & Leung, 2001, 2002; Xue, Zhang, Holroyd, & Suen, 2008).

Previous investigations have supported biologic mechanisms for some of the clinical effects of auricular acupuncture. The largest body of empirical evidence for auricular acupuncture is in the treatment of pain conditions. Several studies have demonstrated the release of endogenous endorphins (Clement-Jones et al., 1980; Pomeranz & Chiu, 1976; Sjolund, Terenius, & Eriksson, 1977) and the activation of cortical and limbic brain structures (important in the transmission of pain impulses) after auricular acupuncture treatments are performed (Romoli et al., 2014). These findings are consistent with somatic acupuncture studies and provide supporting evidence as to why auricular acupuncture treatments are appropriate in the treatment of pain (Feng et al., 2011; Liu et al., 2011; Napadow et al., 2009).

The consistency between somatic acupuncture and auricular acupuncture in previous studies has allowed practitioners to draw some parallels between the two approaches. However, fewer investigations have solely examined the biological mechanisms of action for auricular acupuncture, and therefore, less is known about its use in the treatment of other health conditions. A growing number of investigations have demonstrated the release of serotonin,

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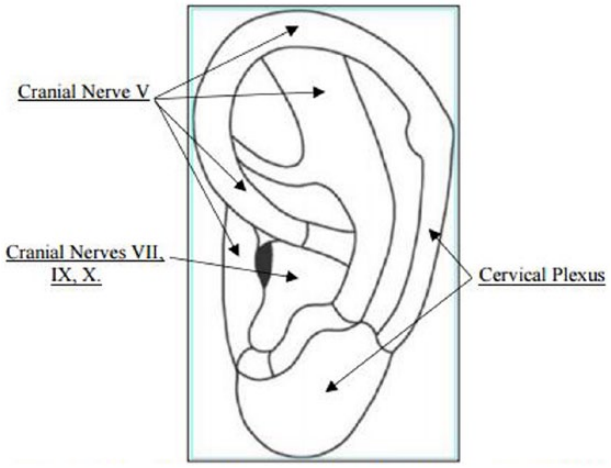

Figure 1. Innervation of the External Auricle.
Note: Cranial nerve V (trigeminal nerve), cranial nerves VII (facial nerve), IX (glossopharyngeal nerve), X (vagus nerve), cervical plexus (C2 and C3). Figure adapted from Oleson (2003).

dopamine, and norepinephrine after somatic acupuncture is performed (Qu & Zhou, 2007; Yoo, Oh, Kwon, Lee, & Bai, 2011; Zhang et al., 2012). This finding has led many practitioners to believe that these substances are released after auricular acupuncture is performed; however, further studies are needed to support this belief.

Recent auricular acupuncture studies have focused on the physiologic effects of auricular acupuncture due to the unique innervation of the ear (cervical plexus-ear lobe and helix, cranial nerve V-pinna of ear, cranial nerves VII, IX, X-concha of ear) and its ability to activate the parasympathetic nervous system (Figure 1; Haker, Egekvist, & Bjerring, 2000; He et al., 2013; H. Li & Wang, 2013; Q. Q. Li et al., 2013; Lin et al., 2011). Parasympathetic nervous system activation after auricular acupuncture treatments is believed to be a result of stimulation of the auricular branch of the vagus nerve (ABVN) in the concha and external auditory canal of the ear (H. Li & Wang, 2013). This innervation provides afferent input to the nucleus tractus solitarius (NTS), which innervates numerous brain structures including limbic structures and the amygdala (He et al., 2013). Using this afferent-to-efferent pathway, researchers have been able to describe activation of the parasympathetic nervous system without affecting muscarinic receptors (H. Li & Wang, 2013). This innervation pathway may allow auricular acupuncture to target specific brain structures involved in processing emotion, memory, learning, sensory input, and gastrointestinal regulation in a more specific fashion than medication therapy is able to achieve.

Auricular acupuncture's effect on endorphin release and activation of the parasympathetic nervous system may have important implications for veterans with PTSD. Specifically, auricular acupuncture treatments likely improve symptoms of chronic pain in this population and might promote balance within the autonomic nervous system. Additionally, because of the innervation of the ABVN on the NTS, auricular acupuncture treatments may have some influence on limbic and limbic-related structures as a result of NTS innervation. Interestingly, these brain structures are implicated in both sleep regulation and in the pathophysiology of PTSD (Cheng, Knight, Smith, Stein, & Helmstetter, 2003; Germain, Buysse, & Nofzinger, 2008; Tang, Yang, Liu, & Sanford, 2005).

Few studies to date have examined the use of auricular acupuncture in veterans with PTSD; however, two recent studies reported improved sleep quality after auricular acupuncture treatments were administered to veterans with PTSD (Cronin & Conboy, 2013; Prisco et al., 2013). Prisco et al. (2013) examined the use of an auricular acupuncture protocol with five acupoints administered in a group setting twice weekly for an 8-week period to veterans with PTSD and insomnia. Respondents in this study were randomized to one of three groups: (1) a true auricular acupuncture group, (2) an auricular acupuncture sham group, or (3) a wait-list control group. Outcome measures were subjective sleep quality (measured by Insomnia Severity Index and Morin Sleep Diary) and objective sleep measures (by actigraphy). Statistically significant differences in subjective sleep quality for respondents in the true auricular acupuncture group as compared with the sham auricular acupuncture group or the wait-list control group were reported at 1 month, $p = .0165$ (Prisco et al., 2013). No statistically significant differences for sleep measures by actigraphy between groups were found. This study was limited by a small sample size, the use of music during the auricular acupuncture intervention, and conventional care received by respondents during the study period was not monitored.

A second investigation conducted by Cronin and Conboy (2013) also examined the use of auricular acupuncture for PTSD-related insomnia among veterans. This study used the National Acupuncture

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Detoxification Association protocol. The National Acupuncture Detoxification Association protocol was administered daily for five consecutive days to veterans (Cronin & Conboy, 2013). Respondents in this study were randomly assigned to an intervention group or a wait-list control group. Outcome measures were subjective sleep quality (measured by the Pittsburgh Sleep Quality Index) and PTSD symptoms (measured by the PTSD Military Checklist; PCL-M). Statistically significant differences in sleep quality and PTSD symptoms were noted posttreatment in the intervention group as compared with the wait-list control group, $p = .04$, $p = .05$ (Cronin & Conboy, 2013). This study was limited by sample size, lack of sham group and, lack of monitoring hypnotic medications or conventional care during the study period.

Although more research is needed to further examine the clinical effects and physiologic mechanisms of action of auricular acupuncture, these studies provide some preliminary data to support the use of auricular acupuncture treatments in veterans with PTSD. The purpose of this investigation was to explore the self-reported benefits of receiving a standardized auricular acupuncture treatment.

Method

This qualitative study was derived from pilot feasibility study titled "Auricular Acupuncture for Sleep Disturbance among Veterans with Post-Traumatic Stress Disorder: A Feasibility Study" (King et al., 2015)." The original pilot study was a prospective, randomized, wait-list controlled feasibility study that examined sleep quality by objective (actigraphy) and subjective measures (Pittsburg Sleep Quality Index) between an auricular acupuncture intervention group and a wait-list control group. After examining sleep quality measures between groups, the control group was offered the auricular acupuncture insomnia regimen. No significant differences in objective sleep measures (actigraphy) were demonstrated in this study ($p > .05$). However, two subjective measures (daytime dysfunction and sleep quality, components of the Pittsburgh Sleep Quality Index) demonstrated significant differences between veterans who received auricular acupuncture and those who did not ($p = .004$ and $p = .003$, respectively). Additionally, this study demonstrated that veterans with PTSD would participate in auricular acupuncture treatments and were receptive to it. Participants' written comments to an open-ended question regarding their participation in the study were largely positive, and therefore, we conducted a qualitative analysis to further examine themes within the written text. Participants who received the auricular acupuncture insomnia regimen (both the intervention group and the control group) were asked to provide written feedback regarding their participation in the study. A phenomenological perspective was adapted to examine these qualitative data, as the research team attempted to gain a deeper understanding of the experience of receiving auricular acupuncture treatments from the perspective of active duty veterans with PTSD (Giorgi, 2000).

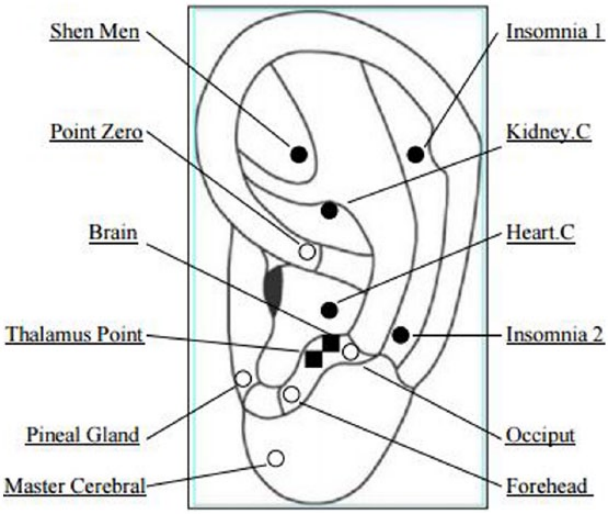

Figure 2. Insomnia Auricular Acupuncture Protocol With Identified Acupuncture Points.
Note: (•) Represents raised regions of the auricle, (○) represents deep regions of the auricle, and (■) represents hidden regions of the auricle (Oleson, 2003). Used with permission from Elsevier Copyright Clearance Center and Dr. Terry Oleson.

Thematic content analysis was used to analyze the qualitative data obtained through the written open-ended question.

Intervention

The auricular acupuncture used in the original study was an auricular acupuncture insomnia protocol as described by Dr. Terry Oleson, an internationally known auricular acupuncture expert (Oleson, 2003). This auricular acupuncture protocol included the following acupoints: shen men, point zero, brain, thalamus point, pineal gland, master cerebral, insomnia points 1 and 2, kidney, heart, occiput, and forehead (Figure 2). This protocol was selected based on expert consultation with a military medical

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acupuncturist and a literature review of auricular acupuncture protocols and acupoints used for insomnia treatment (Chen et al., 2007; Oleson, 2003; Sjöling, Rolleri, & Englund, 2008).

Participants who received the auricular acupuncture were treated lying down in a quiet private room. The external auricles of both ears were cleaned with isopropyl alcohol. A clean insertion technique was used with stainless sterile steel SEIRIN D Type acupuncture needles (0.20 mm diameter, 15 mm in length) on each of the identified acupuncture points to bilateral ears. Each treatment lasted a total of 30 minutes and was performed three times per week for 3 weeks. All auricular acupuncture interventions were administered by a military nurse with supplemental privileges to perform auricular acupuncture and had 2 years of clinical experience performing auricular acupuncture treatments.

Participants

This study was approved by an institutional review board located in the Southern California region. Participants were active-duty military personnel participating in a 10-week residential PTSD treatment program for combat-related PTSD. PTSD diagnosis was confirmed by a board-certified psychiatrist using the *DSM-IV* PTSD criteria for all participants. Study exclusion criteria included the presence of significant comorbid conditions, history of moderate or severe traumatic brain injury, known sleep apnea or other sleep disorders, scoring greater than 3 on the STOP-Bang Questionnaire (an instrument predictive of obstructive sleep apnea), or essential tremors. Participants had severe PTSD (measured by PCL-M mean scores of 69.3 ± 10.9 at baseline and 70.1 ± 9.9 at conclusion of study). This study was conducted during the first 5 weeks of the PTSD treatment program. Increases seen in PCL-M scores over time are consistent with veterans receiving care in a residential setting in which PTSD symptoms worsen during the first 5 weeks of treatment and then improve during the last 5 weeks.

Participants received a multimodal treatment approach for PTSD that included individual and group cognitive processing therapy, medication therapy, educational classes, exercise programs, family education, and community involvement.

Data were collected from veterans after they had received a total of nine auricular acupuncture insomnia protocol treatments (three treatments per week for 3 weeks). A total of 30 participants consented to participate in this study. However, eight participants withdrew from the residential treatment program and therefore did not complete the study. Additionally, one participant voluntarily withdrew from the study due to discomfort with the auricular acupuncture treatment and one participant was disenrolled from the study due to severe obstructive sleep apnea (an exclusion criteria of the study).

Instruments

Participants were asked to record written feedback regarding their experiences at the end of the study period by answering the following open-ended question: "Please write any comments or feedback in the space below regarding your participation in this study, and any recommendations for future studies with acupuncture." The open-ended question was authored by the primary investigator of this study. Seventeen of the participants provided written comments regarding their experience with auricular acupuncture during the study.

Data Analysis

A thematic content analysis was used to analyze written comments made by participants (Neuendorf, 2002). Deidentified data were transcribed verbatim into a qualitative software program (Atlas.ti, Version 7, Berlin, Germany). Data were reviewed for accuracy by a second investigator with the original written comments prior to the coding procedure. Codes were defined by the study team. Data were independently coded by two investigators, and disagreements between coders were resolved by having a third coder. Interrated reliability was calculated to ensure that the codes were well defined by the investigators (.88-1.0, Cohen's κ). The research team then met to discuss the codes that emerged and these codes were then grouped together in meaningful clusters. The research team further discussed the relationship between the clustered codes and the prominent themes that emerged from the data.

Results

Descriptive Analysis

A convenience sample of 30 male participants was recruited for this study. Of the 30 participants

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Table 1. Participant Characteristics.

Characteristic	*n*
Gender	
Male	17
Female	0
Ethnicity/race	
Hispanic	5
White (non-Hispanic)	10
Asian	1
Pacific Islander	1
Age (years)	
18-24	2
25-36	11
37-49	4
Branch of service	
Marine	8
Navy	6
Army	3
Educational level	
High school diploma or equivalent	10
Some college, no degree	6
Master's degree	1

recruited, 10 did not complete the study. One participant was disenrolled due to not meeting inclusion criteria of the original study, seven participants left the residential PTSD program, and two other participants voluntarily withdrew from the study. The two subjects who voluntarily withdrew from the study endorsed the following reasons for their decision not to continue with the study: one respondent cited feeling overwhelmed with the requirements of the study in addition to the PTSD residential treatment program, and the other endorsed pain while receiving the auricular acupuncture treatment.

Of the remaining 20 participants, 17 provided written comments regarding their participation in the study. The high overall attrition rate in this study (33%) is consistent with previous studies among veterans with PTSD (Vella, Milligan, & Bennett, 2013). The investigators believe that the attrition rate was not due to the acceptability of the auricular acupuncture intervention but due to the high attrition rate from the PTSD residential program and subsequent withdrawal from the study. Participant characteristics are listed in Table 1.

Qualitative Analysis

Written comments from participants provided insight of the self-reported benefits from receiving the auricular acupuncture regimen. Four key themes emerged from the data: (1) improved sleep, (2) increased relaxation, (3) decreased pain, and (4) loved/liked the auricular acupuncture treatments. Each category is explained in detail below.

Improved Sleep. A total of 11 participants described improvements in sleep quality. Six of these participants reported their sleep quality improved in general terms. However, five participants mentioned specific ways in which auricular acupuncture improved their sleep quality. These comments included an ability to fall asleep faster, stay asleep longer, fall asleep during auricular acupuncture treatments, and experience fewer nightmares. Two participants also commented on improvements in daytime functioning which could be a result of improved nighttime sleep quality or an immediate effect of receiving the auricular acupuncture treatments.

Increased Relaxation. Eleven participants reported feelings of increased relaxation both during and after receiving the auricular acupuncture treatments. However, variations of the onset, duration, and intensity of relaxation were described. Examples of comments which described this variation included the following: "I immediately felt more relaxed," "[I felt] more relaxed throughout the day," and "I forgot everything for the 30 minutes." This variation in relaxation among participants may likely be due to individual biologic differences, medication use, and severity of PTSD and/or comorbid conditions.

Decreased Pain. Seven participants reported that the auricular acupuncture treatments reduced musculoskeletal pain. These participants described improvements in low back pain, hip pain, neck pain, and headache after receiving auricular acupuncture treatments. One participant stated, "Given a scale of 1-10, I would have daily back pain radiating from 7-9. However, immediate [ely after] taking effect, the back pain would be gone for the remainder of the day and well into the night." Four participants also described a decrease in headache pain after receiving auricular acupuncture treatments. One participant stated, "I also feel that it take [s] my headache away after treatment."

Loved/Liked Auricular Acupuncture Treatments. Six participants frequently described they "liked" or

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"loved" receiving the auricular acupuncture treatments. One participant wrote, "I loved the treatment given and would gladly participate in the acupuncture project again." Another participant wrote, "I love it because it help[s] me relax every time I get the treatment [and] it makes me feel good." Similar comments were written by six participants. No negative written comments stating that participants did not like the acupuncture were present in any of the transcripts.

Discussion

To date, few investigations examining the effects of auricular acupuncture treatments have included the perceptions of veterans with PTSD. Results from this study suggest that auricular acupuncture treatments may be a valuable adjunct to improve a variety of symptoms experienced by veterans with PTSD. The intent of the original study was to improve sleep through the use of a standardized auricular acupuncture treatment, but comments from participants described a wide range of improvements including effects on sleep quality, relaxation levels, and pain levels. These benefits were unexpected, but important, given that veterans with PTSD are frequently affected by comorbid insomnia, anxiety, and chronic pain. This study provides some preliminary data of the effects of receiving auricular acupuncture treatments as described by veterans with PTSD. These effects may be a result of one or more of the known physiologic mechanisms of auricular acupuncture treatments: endogenous endorphin release, parasympathetic nervous system activation, neurotransmitter release, or a combination of these mechanisms. However, these effects are not fully understood, particularly in relationship to PTSD pathology. It is important to develop strategies to improve the multiple symptoms experienced by veterans with PTSD, and indeed, further studies are needed to investigate the mechanisms of actions of auricular acupuncture treatments in this population.

Another important finding in this study was that the auricular acupuncture treatments were either liked or loved by the majority of participants. With the known high attrition rates of veterans with PTSD enrolled in resident treatment programs, it is important to determine nonpharmacologic treatment modalities that veterans with PTSD enjoy participating in. A high level of patient acceptance may result in greater treatment utilization for this population, facilitating a multimodal approach to managing their symptoms. Incorporating multiple modalities into the treatment of PTSD could be beneficial when considering the complex nature of veterans with PTSD and the challenges associated with treating patients with this disorder. Therefore, auricular acupuncture treatments may have a role in treating this population. Given the preliminary data on the benefits of auricular acupuncture for veterans with PTSD, further studies are warranted.

Limitations

This study was limited by the small sample size, lack of a sham or control group, lack of controlling sleep medications, lack of controlling for PTSD severity, and exclusion of female participants. Furthermore, the primary author conducted both the intervention and the data analysis.

A lack of control for acupuncturist–patient interaction during application of auricular acupuncture is another limitation of this study.

Clinical Implications

Auricular acupuncture has particular importance to military and civilian nurses who are now allowed to administer auricular acupuncture treatments within MTFs. This change in practice for nurses working within MTFs is authorized under Department of Defense policies and service-specific instructions (Bureau of Medicine and Surgery, 2013; Department of Defense, 2014). Requirements for nurses to practice auricular acupuncture within MTFs include completing an approved training course, passing an examination, and submitting a training certificate to a local privileging authority with facility specific criteria (Bureau of Medicine and Surgery, 2013).

Civilian registered nurses employed outside MTFs must comply with state boards of nursing. Currently, many states do not recognize auricular acupuncture within the scope of practice for registered nurses. However, given that military and civilian nurses within MTFs have been administering auricular acupuncture treatments since 2011, the availability of this treatment has been widely expanded and may have some implications for the future administration of these treatments by nurses. The performance of auricular acupuncture by nurses has continued to promote further scientific inquiry into the effects of auricular acupuncture and may

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further inform policy makers of the ability of nurses to perform this treatment modality.

Implications for Future Research

The selection of a PTSD residential treatment facility or outpatient PTSD treatment facility should be carefully considered by future investigators with similar study designs. Due to the use of a PTSD residential treatment facility in this study, participants represented some of the most severe cases of PTSD on active duty. This likely contributed to the high attrition rate experienced in this study. Investigations that use outpatient PTSD treatment facilities may experience a lower attrition rate due to the less severe nature of veterans receiving care in these settings.

Future studies that examine the effects of auricular acupuncture treatments among veterans with PTSD are clearly needed. Future studies that include both qualitative and quantitative methodologies would likely capture more detailed data regarding the benefits of auricular acupuncture treatments in this population.

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