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Abstract

The impact of posttraumatic stress disorder (PTSD) on our combat veterans and their families is extensive. Symptoms of anxiety and the effects of sleep disturbance have a negative impact on daily functioning (Wright et al., 2011). The presence of a dog has demonstrated a reduction in anxiety symptoms, which may have a positive influence on improved sleep (Shearer, Hunt, Chowdhury, & Nicol, 2016). The Veterans Administration (VA) has been using canines to assist combat veterans in reintegrating into civilian life, and most currently, as a part of psychological therapy (Rubenstein, 2012). This research examined the impact on combat veterans with PTSD of receiving and training a service dog using Stake's (2006) collective case study model. Interviews were conducted with fifteen combat veterans diagnosed with PTSD participating in a 14-week program for receiving and training their own service dog. The goal of the study was to explore the veterans' experience of the training program, as well as determine any effect on their PTSD symptoms. Symptom severity decreases were reported, which had the residual effects of decreased anxiety symptoms, sleep disturbance, and nightmares.

Keywords

Posttraumatic Stress Disorder, Veterans, Anxiety, Service Dogs, Sleep Disturbance, Nightmares, Flashbacks, Case Study

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Anxiety Symptoms and Sleep Disturbance in Veterans with Posttraumatic Stress Disorder: The Impact of Receiving and Training a Service Dog

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The impact of posttraumatic stress disorder (PTSD) on our combat veterans and their families is extensive. Symptoms of anxiety and the effects of sleep disturbance have a negative impact on daily functioning (Wright et al., 2011). The presence of a dog has demonstrated a reduction in anxiety symptoms, which may have a positive influence on improved sleep (Shearer, Hunt, Chowdhury, & Nicol, 2016). The Veterans Administration (VA) has been using canines to assist combat veterans in reintegrating into civilian life, and most currently, as a part of psychological therapy (Rubenstein, 2012). This research examined the impact on combat veterans with PTSD of receiving and training a service dog using Stake's (2006) collective case study model. Interviews were conducted with fifteen combat veterans diagnosed with PTSD participating in a 14-week program for receiving and training their own service dog. The goal of the study was to explore the veterans' experience of the training program, as well as determine any effect on their PTSD symptoms. Symptom severity decreases were reported, which had the residual effects of decreased anxiety symptoms, sleep disturbance, and nightmares. Keywords: Posttraumatic Stress Disorder, Veterans, Anxiety, Service Dogs, Sleep Disturbance, Nightmares, Flashbacks, Case Study

Introduction

Posttraumatic stress disorder (PTSD) falls within the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM 5) category of Trauma-and Stressor-Related Disorders. The manifestation of symptoms of PTSD will follow one or more traumatic events, which may include “war as a combatant...threatened or actual physical assault...being taken hostage, terrorist attack, torture, incarceration as a prisoner of war” (American Psychiatric Association [APA], 2013). Living with PTSD presents many challenges. Individuals may present with fear-based re-experiencing of the traumatic event, anhedonic or dysphoric mood, negative cognitions, arousal, and reactive-externalizing symptoms, emotional symptoms (APA, 2013). The combination of symptoms experienced may be different for each individual suffering with PTSD, some being more predominant than others (APA, 2013). Reexperiencing may include persistent, involuntary, and disturbing recollections of traumatic events. These recollections consist of sensory, emotional, and physiological components manifesting as nightmares or periods of dissociation, which may last seconds, hours, or days in which the individual is reliving the traumatic event as if it were actually occurring (APA, 2013). These are referred to as flashbacks and can be with or without complete separation from reality (APA, 2013). Triggers are sensory or event-related situations that the individual associates with the traumatic event. Heightened arousal, hypervigilance, heightened startle reflex to loud noises, and sudden, unexpected movement may be observed (APA, 2013). Concentration, focus, and memory

problems, as well as sleep disturbances are pervasive. Depersonalization and derealization are persistent in those who meet the criteria for the dissociative symptoms specifier (APA, 2013).

Literature Review

Physiological effects of PTSD include a continuous state of arousal, manifested in problems with sleep, difficulties with focus, exaggerated startle response, anger, frustration and irritability, and hypervigilance (Olf, Polak, Witteveen, & Denys, 2014; Twamley et al., 2009; Walter, Palmieri, & Gunstad, 2010; Whealin, 2015). Anxiety can either enhance or impair cognitive function. Enhancement occurs with a normal stress response. Cognitive function is impaired when the stress response is persistent, such as in PTSD (Twamley et al., 2009). Impairments may be observed in intellectual functioning, reasoning, decision making, attention/working memory, verbal memory, processing speed, learning, and executive functioning (Olf et al., 2014; Twamley et al., 2009; Walter et al., 2010; Wirth, 2015). Executive functioning regulates impulse control and mood; thus when impaired, one may be unable to work independently, maintain relationships, and manage self-care (Walter et al., 2010). The effects on executive function may also impede treatment participation, treatment success and may explain high dropout rates of veterans receiving treatment for PTSD (Goetter et al., 2015; Hoge et al., 2014; Hudenko, Homaifar, & Wortzel, 2016). Sleep disturbances plague those with PTSD, keeping them from falling and staying asleep. Sleep deprivation causes problematic issues such as more severe daytime PTSD symptoms, higher suicide rates, substance abuse, inferior treatment outcomes, and exacerbates co-occurring psychopathology (Babson, Blonigen, Boden, Drescher, & Bonn-Miller, 2012; Picchioni et al., 2010; Wright et al., 2011).

The stigmatization associated with mental health issues for those in the military keeps many from seeking treatment (Fragedakis & Toriello, 2014; Hoge, Auchterlonie, & Milliken, 2006; Hoyt & Candy, 2011). The military culture endorses invincibility and looks at mental illness as a weakness (Mittal et al., 2013). Veterans believe the public will view them in a negative light, seeing them as dangerous, violent, or crazy, and hold them responsible for their illness and behaviors because they chose to join the military (Mittal et al., 2013). The trust veterans have built with military comrades does not carry over to civilians; thus civilian mental health providers may have difficulty establishing a therapeutic alliance. Understanding military culture becomes central to working with veterans (Coll, Weiss, & Yarvis, 2011; Substance Abuse and Mental Health Services Administration, 2010). The stigma associated with mental health treatment for veterans warrants an alternative treatment for those who may not be willing to seek help in a more traditional manner (i.e., inpatient treatment or outpatient treatment requiring continued visits to a mental health professional).

Identifying a treatment modality for PTSD considered more acceptable by the veteran population, encouraging participation and completion of a program, and improving symptoms of PTSD was the purpose of this study. Service dogs have long been used to assist those with physical handicaps such as blindness, deafness, and those with ambulatory limitations (Rubenstein, 2012). The Veterans Administration (VA) has been using canines to assist combat veterans in reintegrating into civilian life, and most currently as a part of psychological therapy (Rubenstein, 2012). Evidence has shown an improvement in symptoms such as anxiety, fear, and associated physiological symptoms (Knisely, Barker, & Barker, 2012). The military has many animal-assisted therapy (AAT) programs; however, there have been no published empirical investigations of the effectiveness of these programs (Knisely et al., 2012; Rothbaum, 2013).

If training their own service dogs lessens the symptoms of anxiety, veterans may be able to become more independent, and potentially participate in, and complete, more traditional

therapy modalities due to improved focus, memory, and mood (Twamley et al., 2009). Training their dog can lead to an improved sense of mastery and control, which is considerably challenged during deployment. Gallagher, Schoemann, and Pressman (2011) found that “mastery beliefs may provide a protective buffer against the experience of anxiety” (p. 227). Decreasing the severity of symptoms may lead to an easing of anxiety causing hypervigilance, which may lead to improved sleep (Zilcha-Mano, Mikulincer, & Shaver, 2011). Walking their dog requires the veteran to be more physically active, promoting physical health, and keeping them from hiding away in their home (Anderson, & Shivakumar, 2013). Exercise has also been found to reduce PTSD and anxiety sensitivity (Fetzner & Asmundson, 2015). These benefits could be life-changing for a veteran suffering from this debilitating disorder.

Animal-Assisted Therapy

To understand why veterans training their own service dog may improve symptoms of anxiety and sleep disturbance, an understanding of the impact of animal-assisted therapy (ATT) both psychologically and physiologically is needed. In a study conducted by Barker & Dawson (1998), anxiety was significantly reduced in hospitalized psychiatric patients when animal-assisted therapy was combined with therapy sessions. In a study looking at the heart rate variability of college students with academic stressors participating in AAT and mindfulness therapy, Shearer, Hunt, Chowdhury, & Nicol (2016) found that the interactions with a therapy dog was a “strong, active control for some of the active components of mindfulness training, including activity, attention, social interaction, and short-term anxiety and dysphoria reduction” (p. 246). Holcomb and Meacham (1989) stated AAT in psychiatric units promoted a more relaxed state and lower blood pressure. Pedersen, Nordaunet, Martinsen, Berget, and Braastad (2011) reported a decline in symptoms of depression and anxiety and an increase of perceived self-efficacy for patients with mental health issues working with animals on a farm. The results in the scoring of mental health domains were positively correlated with time spent in various animal care-related activities. This result may be due to an increase in mastery, which is the perception that one’s life-chances are under their control (Pearlin & Schooler, 1978). A healthy sense of self-mastery has been found to lower psychological distress and buffer the impact of stressors (Hachey, Sudom, Sweet, MacLean, & VanTil, 2016). A sense of self-mastery has a direct impact on one’s perception of self-efficacy, the perception of one’s ability to be successful in a given situation. People will avoid situations that they believe exceed their ability to cope; thus self-efficacy will determine the amount of effort they will put forth in the face of anxiety-producing situations (Bandura, 1977). Blackburn and Owens (2015) research identified self-efficacy as a moderator in the relationship between combat exposure and PTSD. Those who had high levels of combat exposure, and felt they could attain desired personal outcomes, reported lower levels of PTSD, suggesting that improving self-efficacy may assist in lowering the severity of PTSD symptoms, including anxiety, hypervigilance, and sleep disturbance.

AAT has the potential to improve cognition, specifically executive functioning, through the lessening of symptoms of anxiety, which has demonstrated negative effects on cognitive performance (Derakshan & Eysenck, 2009; Eysenck, 1992; Nepps, Stewart, & Bruckno, 2014). Anxiety symptoms may influence memory and attention disturbances, as well as affect the speed of information processing (Grieger et al., 2006; Nelson, Yoash-Gantz, Pickett, & Campbell, 2009). These are components of the brain’s executive function, which controls complex goal-directed behavior (Alvarez, & Emory, 2006; Aupperle, Melrosea, Stein, & Martin, 2012; McCabe, Roediger, McDaniel, Balota, & Hambrick, 2010). AAT has also been found to increase motivation (Le Roux, Swartz, & Swart, 2014; Pedersen et al., 2011). Given

the research demonstrating the calming effect of AAT, the potential for improvement in executive functioning, depressive symptoms, and symptoms of anxiety should be considered.

While the benefits of animal-assisted therapy have been observed in both the cognitive and physiological realms, the effects have been found in some cases to dissipate when the interaction with the animal has ended (Berget, Ekeberg, & Braastad, 2008). This phenomenon can be addressed through the use of service dogs, which would remain with the individual even after the completion of therapy. Currently, a program in Maryland has veterans train service dogs. Reduction of symptoms of PTSD has been noted for these trainers. This program has continuously produced anecdotal evidence which supports these claims (Yount, Olmert, & Lee, 2012). Research is presently being conducted on therapy dogs that have been trained and deployed to Afghanistan and Iraq to determine the effect of their presence on soldiers' mood, job satisfaction, stress, and resilience (Chumley, 2012). Odendaal (2000) found human-dog interactions not only have a positive impact on the climate of therapy, it also has a calming effect on the client, which was thought to be influenced by the increase of oxytocin and decrease of cortisol.

Oxytocin and Cortisol

To understand why animal-assisted therapy assists clients, one must explore the biological effect of human-animal interactions. By using a reductionist approach and examining the basic biological mechanisms during the interaction process, one can support the use of service dogs for PTSD and anxiety treatment. Research looking at human cognition and behavior from a hormonal perspective has found the hormone oxytocin to moderate stress reduction (Neumann & Landgraf, 2012; Uvnäs-Moberg, 1998a), enhance sleep (Lipschitz et al., 2015), attenuate cortisol in the stress response (Ditzen et al., 2009), and promote fear response and extinction (Eckstein et al., 2015; Labuschagne et al., 2010). Research has found a decrease in blood pressure following interaction between humans and dogs (Handlin et al., 2011; Odendaal & Meintjes, 2003), which is attributed to increased levels of oxytocin (Odendaal & Meintjes, 2003; Uvnäs-Moberg, 1998b). Short-term interaction between a dog and its owner has been linked to a significant increase in oxytocin levels. These levels were found to almost double in both the companion animal and their owner following positive time spent together (Handlin et al., 2011). This suggests that a service dog would increase oxytocin levels in the veteran.

Cortisol is another hormone that affects symptoms of PTSD. When the hypothalamic-pituitary-adrenal (HPA) axis is activated by a stressful event, it will trigger the release of cortisol. Repeated activation of the HPA axis due to the increase of stress hormones associated with PTSD continues to trigger the release of cortisol long after the threat has ended (O'Connor, Ferguson, Green, O'Carroll, & O'Connor, 2016). Cortisol dysregulation may lead to cognitive dysfunction and mental health issues. Obsessive-compulsive disorder, depression, and panic disorder have been linked to hypercortisolism (elevated levels of cortisol) (Guilliams & Edwards, 2010). High cortisol levels are also associated with impaired memory and consciousness. An increased production of cortisol may cause atrophy of the hippocampus which can promote dissociation (Sapolsky, 2000). Hypocortisolism (low levels of cortisol) has been tied to depressed mood, fatigue, sleep disturbances and chronic pain (Guilliams, & Edwards, 2010). These findings suggest that treatment for posttraumatic stress disorder should address alterations in cortisol levels. Handlin et al. (2011) found that a short-term interaction between an owner and the dog decreased the owners' cortisol levels. Since cortisol levels are found to be higher with re-experiencing and hyperarousal, the presence of a service dog would assist in attenuating these levels based on the calming effect of increased oxytocin (Odendaal, 2000).

Physical Activity and PTSD

Longitudinal studies have shown that the acquisition of a dog increases recreational walking (Cutt, Knuiman, & Giles-Corti, 2008; Serpell, 1991). Walking is considered an isotonic aerobic exercise which is a “form of exercise in which the muscle contracts and there is movement; joint mobility and muscle strength are improved” (Isotonic Exercises, 2012, n.p., Tiwari, Gehlot, Tiwari, & Singh, 2012). Research results suggest changes in the HPA axis due to exercise mediates stress reactivity (Anderson & Shivakumar, 2013; Rimmel et al., 2007). Kramer & Erickson (2007) noted a benefit of aerobic over nonaerobic exercise of moderate intensity for at least one hour a day, three days a week for improved cognitive functioning. Enhancements of neural networks affecting cognitive functions have positively impacted cognitive areas, such as executive function. Improvements have been seen in selective attention, information processing speed, and cognitive flexibility (Baker et al., 2010). These are areas that are impaired for those with a diagnosis of PTSD (Aupperle et al., 2012).

Sleep Disturbance

Insomnia has greatly increased for military personnel who have been deployed (Armed Forces Health Surveillance Center, 2010). Luxton et al. (2011) reported 72% of U.S. Army infantry personnel stated they averaged less than 6 hours of sleep per night, and 16% reported feeling fatigued and experiencing functional impairment linked to their sleep patterns. Beyond fatigue, sleep deprivation causes impairment in vision and perception, attenuated focus and memory, prolonged reactions, increase in errors, lack of performance precision, inappropriate decision making, and emotional disorders. The negative effects of sleep deprivation last for many days, accumulates over time, and leads to cognitive dysfunction (Orzeł-Gryglewska, 2010). Often insomnia is an antecedent to other serious forms of psychopathology (Pigeon, Britton, Ilgen, Chapman, & Conner, 2012).

Along with sleep disturbance, recurrent nightmares are common with combat-related PTSD (Fontana & Rosenheck, 2008; Leskin, Woodward, Young, & Sheikh, 2002). The nightmares associated with PTSD linger for many years, impacting daily functioning and sense of well-being (Blagrove, Farmer, & Williams, 2004). Schreuder, Igreja, van Dijk, and Kleijn (2001) classified PTSD associated nightmares in three categories: (1) replicative/replay, (2) nonreplicative/symbolic, and (3) mixed. Replicative nightmares are the reliving of an experience, symbolic represents some of the experience of the event, or an idea or feeling associated with the event, and mixed would be a combination of both. Combat veterans tend to have more replicative nightmares when compared to those who survived other forms of trauma. Van der Kolk, Blitz, Burr, Sherry, & Hartmann (1984) stated that in this population, the nightmares happen earlier in the sleep cycle, coinciding with whole-body movement. The content of these nightmares is very disturbing, images of injury, killing, and death accompanied by feelings of fear, helplessness, grief, anger, and revulsion (Harb, Thompson, Ross, & Cook, 2012; Zadra, Pilon, & Donderi, 2006).

Author Information

Diane Scotland-Coogan is an assistant professor in the Master of Social Work program and Saint Leo University. She received her Ph.D. from Capella University in 2017. She is also a Licensed Clinical Social Worker and Clinical Supervisor for the State of Florida. Dr Scotland-Coogan’s research on treatment for PTSD has been driven by her work with veterans and first responders with PTSD and identifying treatments that support lessening symptoms, are strength-based, and promote a decrease in dropout rates. This current research study was

conducted on a service dog program that demonstrated anecdotal evidence of PTSD improvement in this researcher's local area. Portions of this article originally appeared in the author's doctoral dissertation, *Receiving and Training A Service Dog: The Impact on Combat Veterans with Posttraumatic Stress Disorder (PTSD)* (2017), while she was a student in the Department of Psychology at Capella University.

Research Design

This research was a qualitative collective case study using Stake's model. Collective case studies are used to study the differences and commonalities between cases (Stake, 1995). The cases in this study are defined as the individual participants. A constructivist paradigm was used; this recognizes that knowledge is constructed by the researcher to gain an understanding of the lived experience of the study participants. This paradigm suggests knowledge cannot be void of the biases and values held by the researcher (Mertens, 2010); however, it does not reject the potential for objectivity (Baxter & Jack, 2008). The findings, themes, and patterns were reviewed by other researchers not involved with this study to assist in identifying and reducing any biases (Noble & Smith, 2015). Given the limited information available on the use of service dogs for PTSD, the need for identifying the effectiveness of this form of treatment using a descriptive and explanatory method makes a multiple case study the most appropriate choice. The results of this qualitative study may be used to inform future quantitative research studies (Yin, 2012).

Participants

The validity, insight, and meaningfulness of a study are based on the appropriateness of the chosen sample. Purposeful sampling is used for this study in an effort to gain awareness of impact of training their service dog on PTSD symptoms of anxiety and sleep disturbance (Emmel, 2013; Stake, 1995). The population is comprised of veterans of the U.S. Military who directly experienced a combat-related traumatic event, witnessed the event in person, learned of an actual or threatened death of a close friend or loved one in a combat/military-related traumatic event, and/or experienced repeated exposure to details of a combat-related traumatic event. Multiple case studies are used to identify patterns in case findings, making it important to choose cases considered similar (Yin, 2012). Veterans who had completed the training program were given the researchers' contact information by the program if they were interested in participating in this study; those willing to participate contacted the researcher. A total of 15 cases met the identified criteria for inclusion/exclusion and were used for the final data collection process. Since these case studies were used to gain rich detail about the participants' experiences it was appropriate to keep the number of participants somewhat small (Stake, 2006). The researcher met with these veterans and provided and reviewed the informed consent documents. Interviews were then scheduled.

Inclusion criteria for participating in the training program included combat veterans with an honorable discharge identified through a DD214 long-form provided at discharge (US Department of Veteran Affairs, 2015), diagnosed with PTSD by mental health professional, and the physical ability to care for a service dog. All participants were 18 years or older and had successfully completed the training program. Exclusion criteria for participating in the training program included those with a history of violence based on criminal background check by the program.

This study included interviews with 15 combat veterans diagnosed with PTSD participating in a 14-week program, receiving and training their service dog. These semi-structured interviews consisted of open-ended questions, which were audio-recorded and

transcribed verbatim. The transcripts of the interviews were reviewed for meaning units to identify themes and patterns (Strauss & Corbin, 1998).

The training program consists of 14-weekly mandatory group classes in which the veteran is instructed by a master dog trainer on how to train his/her dog. Veterans are expected to reinforce between classes as each class addresses different commands. A final test is given at the end of the training period to ensure the dog meets certification standards.

Sampling methodology. The use of purposeful sampling for this study was deemed appropriate. The list of criteria for inclusion and exclusion was used for screening participants. All participants who had graduated from the dog training program were chosen in an effort to gain detailed understanding of this phenomenon (Emmel, 2013; Stake, 1995). The population was comprised of veterans of the U.S. Military who directly experienced a combat-related traumatic event, witnessed the event in person, learned of an actual or threatened death which occurred for a close friend or loved one in a combat/military-related traumatic event, and/or experienced repeated exposure to details of a combat-related traumatic event. The 15 participants ranged in age from 30-51, were of Caucasian, Hispanic, and African American race/ethnicity, served in the Army, Marines, and Navy, and engaged in OEF/OIF and Vietnam wars. A nonprofit service dog training agency in the southeast was identified and provided potential participants with contact information for the researcher upon completion of the program.

Data Collection and Analysis

Researchers used in-depth, open-ended interviews and direct observations to collect data. The researchers conducted semi-structured interviews, which were then audiotaped and transcribed. An initial 15 open-ended questions were created for these interviews. Questions addressed the veterans' experience of the program staff, other veterans in the program, relationships, and symptoms experienced before starting the training program and any change in those symptoms following completion of the program. Interviews were transcribed verbatim.

Guiding Interview Questions

The interview was semi-structured, allowing for using pre-identified questions, and allowed for flexibility to ask questions based on the participant's response. To ensure a true understanding of the veteran's experience the researcher must have freedom to ask questions to obtain relevant and rich detail from that particular participant (Stake, 1995). Interview questions were open-ended, issue-oriented questions based on participants' responses, allowing for more in-depth data collection. The interview questions included but were not limited to:

1. How did you come to make a decision to seek a service dog?"
2. How has your service dog impacted your life? Physically? Psychologically? Socially? Other ways?
3. What other types of treatment had you participated in for your PTSD? What seemed to help/what didn't?
4. How would you describe your life before receiving your service dog? After?
5. Has the severity of your PTSD symptoms changed since receiving your dog? If so, in what way?
6. What was your experience of the dog training process?

7. How soon after receiving your dog did you notice, if at all, any changes in your behavior? What were these?
8. Have you discovered anything about yourself through your experiences with training and receiving your service dog? If so, what?
9. Describe, if anything, how your dog assists you? Try to be as specific as possible.

Data Analysis

Data analysis is not a specific and separate event in the qualitative research process; it is ongoing throughout the study (Stake, 1995). Thus, data analysis started from the meanings derived by the researcher from first impressions at the beginning of the study process on through the final consolidation of relevant data. Triangulation of data, looking for at least three confirmations for including data, assisted in omitting information which may have no significance to the study (Stake, 2006). A within case analysis of the individual cases within the bounded system was performed for direct interpretation, to develop an understanding of the individual parts of the case, to assist in the across case analysis for both uniqueness, and how the cases might relate to each other (Stake, 1995). Through the review of data meaning units emerged suggesting potential themes (Stake, 1995). Coding was completed to allow for the identification of themes (Stake, 1995). Theme-based assertions of the individual cases findings were identified along with their subsequent patterns (Stake, 2006). A cross case analysis was performed, to give an understanding of the phenomenon through aggregation of theme-based assertions and subsequent patterns from the merged case findings (Stake, 2006). Themes and patterns were examined to determine those which were pertinent to the research question and those which may be discarded (Stake, 2006). Triangulation of the data was conducted to not only confirm relevant information, but to also identify potential ways in which observations may be perceived differently by others (Stake, 2006). Review of interviews, patterns and themes were completed by three colleagues not involved with either the study or the program from which the participants were chosen. Their feedback supported the reported themes and patterns. Naturalistic generalizations were identified as to what others may glean from these cases to inform potential future research, consideration for work with this population, or to learn about themselves (Stake, 1995). All information was reviewed to its relevance for inclusion in the multiple case report (Stake, 2006). Upon completion of identifying themes and patterns of the individual cases, a cross-case analysis was conducted to identify commonalities between cases. Interviews and the preliminary analysis were reviewed by three different professionals, two of these have conducted numerous research projects and are professors teaching research at a graduate level, the other individual was a clinical social worker for the U.S. Air Force, now retired. These individuals provided input on the identified patterns and themes they observed through their review of the interviews, as well as, support for the chosen research method, data collection and preliminary analysis.

Results

The results of this research study suggested a benefit to combat veterans for receiving and training their service dogs. While some participants saw greater improvement than others, the trend was positive for improved PTSD symptomology. Two themes, (1) Anxiety and (2) Sleep Disturbance, with four patterns were identified through the thematic analysis as relevant to the receiving and training of a service dog for combat veterans (Table 2).

Theme	Patterns
Theme 1: Anxiety	Pattern 1.1: Physiological arousal Pattern 1.2: Flashbacks, dissociation, and triggers
Theme 2: Sleep Disturbance	Pattern 2.1: Insomnia Pattern 2.2: Nightmares

Table 2: Themes and Patterns of Cross-Case Analysis

Theme 1: Anxiety.

Participants experienced constant heightened physiological arousal and hypervigilance, accompanied by frequent flashbacks of traumatic events and, at times, instances of dissociation. Some of these experiences were in response to identifiable triggers; others come with no warning. Participants report cognitive issues, especially memory, focus, and concentration, which added to their anxiety. Anxiety symptoms of PTSD include reckless or self-destructive behaviors, hypervigilance, exaggerated startle response, problems with concentration and memory, and sleep disturbances (APA, 2013).

Pattern 1.1, physiological arousal. Heightened states of arousal were identified as feeling on edge, fidgety, intensified startle reflex, and always feeling unsafe, which explains the reported hypervigilance. The hypervigilance, feeling unsafe in most environments (even at home) kept the veterans on high alert for potential threats, sitting with their backs to the wall, constantly looking out the windows, checking doors and window locks. One participant shared his dog assisted him with these symptoms of PTSD “Um, things got pretty bad for a while. Um, she keeps, you know, she [the dog] keeps me cool, calm, and collected, you know. And, so I’m not as antsy and fidgety and- when I’m out and about, you know.” One veteran shared the impact of their service dog continued to show improvement over time even after the program ended.

The service dogs’ responses to the veterans’ anxiety throughout the interviews were unquestionable. During the interviews, participants’ service dogs alerted to the veteran’s anxiety experienced when discussing emotional events. The dogs would get up from lying at their feet, whine, nudge, and at times try to get into the laps of the veterans. They would not stop these behaviors until they were acknowledged, and the veteran had shifted focus and calmed. When asked about his service dog getting up, nudging him and demanding his attention while telling of a particularly distressing event one participant responded, “Right, he can tell...he can tell and then there’s like this.” Still another participant spoke of his service dog’s response during the interview,

Yeah, cause he can- he can- he can- like right now, and you know, it’s funny but...because I was worried about (situation), he can understand that. He can understand that something’s just not right...yeah. It’s just something’s not right so he- this is what he does. He kind of gets up on you, paws at you, looks at you... Oh, it- it- it actually just redirects everything. Now, you know, um, you have to pay attention to him because if you don’t pay attention to him [laughter]...He’s not gonna let you alone, you know, so.

The necessity of the veteran to stop whatever they are doing and focus on the dog appears to redirect the veteran from whatever is upsetting them at that moment, inciting a state of calm.

At times the service dog alerts the veteran before they are even aware they are experiencing an anxiety attack. One participant shared, “And I- he’s recognized my panic

attacks and calmed me down...he recognizes when I start to go in them, and he calms me down.” Another shared, “I found that now with (dog’s name), she’ll come to me and, um, I can touch her and I’ll start grounding myself with her.” The dog’s ability to sense these situations and go to the veteran on their own keeps the symptom severity from getting out of hand. Given the veterans’ resistance to ask for any help, this may also play a big part in the veterans’ success with these service dogs. The ability to detect emotional onset appears to be innate in these dogs. One participant shared he noticed his service dog’s reaction to heightened emotional states even as a puppy,

We got (participant’s dog) when she was eight weeks old and (participant’s wife) noticed how different I was when the dog was around. Um, not as high strung. Any time I started having anxiety issues, anger issues, (participant’s dog) naturally came to me and started calming me down...not so much by her presence but whenever I was- had issues at the house, she would always come and paw at me or rub her muzzle on me or try and get a ball and play with me-something... uh...she distracted me from whatever was making me feel uncomfortable or angry at the time.

The veterans all agreed their anxiety lessened with the receipt and training of their service dog. Some stated while these symptoms are not as severe as they were, they are still working to cope with symptoms of PTSD. Friedmann (1995) stated that through this change in focus, the arousal of the SNS decreases and along with it, levels of anxiety. This response is then experienced as comfort and safety. Mindfulness practices have been found to decrease rumination and the problematic behaviors associated with these (Deyo, Wilson, Ong, & Koopman, 2009; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). Shearer et al. (2016) stated interacting with a therapy dog was a “strong, active control for some of the active components of mindfulness training, including activity, attention, social interaction, and short-term anxiety and dysphoria reduction” (p. 246).

Pattern 1.2, flashbacks, dissociation, and triggers. Participants reported persistent flashbacks, dissociative states in which they would lose time they could not account for, and the experience of triggers that incited these states. Reexperiencing traumatic events for these veterans included persistent, involuntary, disturbing recollections of combat. These involve sensory, emotional and physiological components and are periods of dissociation which may last seconds, hours or days in which the veteran relives the traumatic event as if it were occurring. Given that response to flashbacks may rely on current environmental cues to determine appropriate emotional responses (Friedman, 1995), a supportive, safe, and calm environment would be the ideal situation for a combat veteran who suffers from traumatic flashbacks. Since more realistic perceptions of threat have been found in pet owners (Wisdom, Saedi, & Green, 2009), and with the idea that dogs can provide a “safe haven” for their owners, the potential for a service dog to assist in the ameliorating of flashbacks must be considered. Instances of dissociation became less frequent after the receipt of their service dog; veterans reported their dog staying by their side during these episodes. Knowing their dogs would be by their side and assist them in the case of flashbacks and dissociation, the veterans felt more comfortable leaving their homes.

One participant shared before he received and trained his service dog there would be times when he would get so anxious he would pass out in a store. When asked when the last time he experienced an episode of passing out or fainting, he stated, “Uh, it has been a while. Um, probably over a year ago.” When asked when he finished the program he responded: “Uh, about a year ago.” Another shared her experience with dissociation,

He's got my back. Um, (name of store), it was right after we, I guess, what was it? May or June last year. I don't know. I felt like I was getting closed in and I just froze and I just kinda slid down to the floor and he kinda reminded me that it was OK because he was in my face licking me and pushing me and he got me back up and I was OK. He controls my anxiety." One participant shared that he had frequent experiences of dissociation, "Uh, him, having him I know I have a, you know, I'd say a battle buddy. I know that he'll watch over me. If I get a little too antsy, he can sense it. I don't know if that's the best word but he pretty much knows I'm getting a little too nervous so he'll come up to me, if I'm getting a little, start spacing out too bad, he'll nip and me and say hey, you know, master, you're getting kind of way out there, kind of get back into focus.

This veteran further shared that his dissociative states last up to a half-hour, and his service dog stays by him trying to get his attention,

He actually is helping out, I mean, cause I not when I get kind of squirrely, when I start spacing out, I don't even realize I am spacing out and I'll look at my watch and it's twenty or thirty minutes later and I'm like, wow, I've been spacing out that much and there he is, really just tugging on me and I have a bunch of bite marks from it...he'll be guarding me and he'll be tugging the heck out of me, he's like, uh, master, it's time for you to get back out of this.

When discussing an experience of dissociation participant 6's dog alerted to anxiety and had to be instructed to lay back down,

She'll redirect me. If ... There's been several times where I was [speaking to dog: Platz] I was out in public settings basically and, I call it a trance. It's, I just kind of, the lights are on but nobody's home. And I'm just staring off into space and she, she'll bark or jump up on me to, I guess distract me, get my attention, um.

Reductions in anxiety is an important finding for this study. The veterans shared having their service dog with them gave them a feeling of safety and security and increased their self-confidence. Participants reported symptoms of anxiety, heightened physiological arousal, hypervigilance, flashbacks, and periods of dissociation, improved with the training and receipt of their service dog. This effect appeared to be felt within weeks after starting the program and continued to improve over time. Many participants found their anxiety decreased after receiving their dog. One participant shared her dog is "kind of like medication for me. Um, she definitely isn't a cure, but she makes it easier to deal with, um." The ability to refocus and calm appears to be an important part of the healing found with the veterans interviewed.

Theme 2: Sleep Disturbance

Sleep disturbance, Theme 2, was broken down into two patterns; Pattern 2.1, Insomnia, and Pattern 2.2, Nightmares. In Pattern 2.1, veterans reported problems falling and staying asleep before the receipt of their service dog. This difficulty may be attributed to their hypervigilance. The Pattern 2.2, nightmares had a formidable effect on all of the participants. These nightmares were described as violent, intense, and horrific depictions of their traumatic experiences.

Pattern 2.1: Insomnia. An increase in insomnia has been found in those who have deployed. Research has noted the impact of sleep deprivation can be fatigue and functional impairment, problems with vision and perception, decreased focus and memory, prolonged reactions, increase in errors made, lack of performance precision, inappropriate decision making, and emotional disorders. The effect of sleep deprivation and sleep disturbance lasts for days and will accumulate over time (Orzeł-Gryglewska, 2010). Veterans reported problems with falling asleep, staying asleep, as well as experiencing horrific nightmares which negatively impacted any sleep they may have gotten. When asked about improvements in sleep, one participant shared,

Well, the quality of it, yes. The amount of it, no...It got basically, it got to a point where I was sleeping by myself. When I got her (participant's dog), she started sleeping with me. After about three months, (participant's spouse) was able to come sleep in the bed with me again without me waking up in the middle of the night and beating the hell out of (participant's spouse).

Another participant stated he had trouble sleeping when they returned from deployment, "But I- I- had trouble, at first I thought it was normal because, you like, get up at four and it's night time when you come home and, uh, as a (military position) it was seven days a week..." Another shared "Uh, he's like a comfort blanket. He keeps me calm."

Pattern 2.2: Nightmares. The frequent nightmares were horrific, the participants experienced terror and helplessness, and reported not wanting to go to sleep knowing what was awaiting them. One participant shared how their dog helped them, "The nightmares- I- I- I just, I didn't go to sleep because I didn't want the nightmares. So, um, I'd stay up. Um, actually, June of this past year...was the first time I slept in my bed in 7 years." In most cases, their spouses would not be able to wake them from these, and if they did the reactions could be physically violent as they were still experiencing the nightmare's situation (back in combat). One participant shared,

Every now and then something will set off a bad dream or something like that. If I'm tossing and turning my wife can't (spouse) [sic] wake me up but he comes in and licks me, puts his paw and noses you and gets you up (inaudible) and you scratch him a few times, he goes back to bed and you're ok... On his own. Nobody- nobody taught him that. He just picks up on it. He knows.

The veterans found their service dogs assisted them with their nightmares. The dogs' abilities to sense the anxiety of the nightmare and wake them through whining, barking, nudging and jumping on them, whatever it took to wake them, stopped the nightmares shortly after they started. Nightmares not only were reported as less frequent, but they were also less violent in nature, one participant shared "...am I still having nightmares? I'm still having them. I don't remember them. I go right back to sleep...They're not as violent...I don't feel they're as hard on me..." Another participant stated,

...I don't really ever remember any of my dreams. Um, typically the way I know I'm having a nightmare, (participant's dog) will get in my face and wake me up. Um, and like, I'm covered in sweat and my heart's racing and all that stuff. Um, but that- that hasn't happened in a couple months. At least.

When asked about any change in symptoms since receiving their service dog, a participant responded, "Um, I don't have nightmares as often. Um, they're not as intense." Having their service dog with them at night did provide a sense of safety and security, which allowed them to fall asleep, and if they awoke through the night, the dog soothed. One participant stated her dog has helped improve her sleep, "makes it easier...with the nightmares, she sleeps with me, and she'll wake me up." Still another shared, "Well, he wakes me up from nightmares. He does it gently. He's there." The commonality between veterans in the area of sleep disturbance was seen both in their experiences before receiving their service dogs, insomnia and frequent nightmares, and after the receipt of their dog of improved quantity and/or quality of sleep, and reduction in the frequency and intensity of nightmares. Given the problematic issues noted for sleep deprivation, improving sleep has far-reaching benefits for these veterans.

Discussion

Improvement in symptoms of anxiety and sleep disturbance in PTSD was reported by all of the 15 participants in this study. These improvements were noticed in as little as a few weeks of starting the training process with their dogs. Given the unsuccessful treatment history of these veterans, this information is very important for those who work with the veteran population. Another benefit identified during this study was the limited stigma associated with this form of treatment for PTSD, which may increase participation and completion of the program.

Symptom severity decrease had the residual effects of improved sleep, decreased anxiety, enhanced self-efficacy, and hope for the future. Four of the veterans reported they no longer needed their antianxiety medications, and still others stated their dogs worked better for them than any other treatment, including medication. The results of this study support the beneficial anecdotal information of training service dogs provided by the Warrior Canine Connection (Yount et al., 2012). The implications for clinical practice with veterans with combat-related PTSD must be considered and should be the subject of future quantitative research studies.

For those who were still struggling with some of their PTSD symptoms, consideration must be given to the potential of continued improvement over time. Another consideration would be the improvement in symptoms enhancing the ability to participate in more traditional forms of therapy. This may include reduced anxiety providing the ability to leave their home, improved cognition in the form of enhanced executive functioning, and improved self-confidence which may attenuate the stigma associated with mental health issues and treatment in the military and veteran population.

Given the prevalence of PTSD symptoms and diagnoses in veterans, the small percentage of those with this disorder seeking treatment, and the high dropout rates for PTSD treatments, this type of alternative treatment is greatly needed (Coll et al., 2011; Fisher, 2015; Goetter et al., 2015). From 2000 through 2015, 138,197 cases of PTSD have been diagnosed among veterans of the Gulf wars. This data does not include warriors from previous wars; therefore we can conclude that these numbers may be much higher (Fisher, 2015). These data suggest an increased need for trauma-informed mental health practitioners utilizing evidence-based treatments for PTSD which are successful and are not subject to the military's stigma of mental health treatment. Programs that have the veterans receive and train their own service dog may be an answer to this dilemma.

Limitations for this qualitative research may include small sample size, methods of sampling, generalizability, reliability, and validity. As the purpose of the study is to gain rich detailed information about the veteran's experience, it was appropriate to keep the number of participants somewhat small, in the range of 8-14 participants (Stake, 2006), 15 participants

participated this study. Yin (2012) notes the multiple case study is used to identify patterns in case findings, so it is important to choose cases which predict similar results (Yin, 2012), which supports the use of purposeful sampling. The intended goal of this research study was to provide a rich, detailed, contextual understanding of the chosen cases, not to be generalized to this population. Stake (1995) states a qualitative case study seeks particularization overgeneralization. Therefore, the phenomenon must be explored exhaustively to provide the rich detail needed for a better understanding of the research topic. For this study, the phenomenon was the training and receipt of a service dog for combat veterans with PTSD.

The potential for researcher bias was anticipated as this researcher has worked with children and veterans with PTSD. This potential for bias required the researcher to identify potential assumptions and to ensure not to ask leading questions. These steps, along with the triangulation of data for each case supporting the final report and having transcripts, themes, and patterns reviewed by three separate researchers the potential of researcher bias influencing results was minimized.

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