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Post-Traumatic Stress Disorder and Dementia in Aging Veterans: An Overview for Health Care Professionals

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**Post-Traumatic Stress Disorder and Dementia in Aging Veterans:
An Overview for Health Care Professionals**

by

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Chapter 1: Introduction

Reasons for Research

Post-traumatic stress disorder (PTSD) has been defined by the National Institute of Mental Health as a mental health condition that may develop when a distressing event occurs and induces symptoms such as intrusive thoughts, hypervigilance, panic attacks, or flashbacks (Bartzak, 2016). While the signs of PTSD most often occur within weeks or months following the trauma, PTSD can manifest after several years (Australian Nursing and Midwifery Federation, 2015). PTSD was not formally recognized until the 1980s after the Vietnam War; however, it certainly existed before this, and was labeled shell shock in World War I and combat fatigue in World War II (Australian Nursing and Midwifery Federation, 2015; Averill & Beck, 2000; Barnes & Harvey, 2000).

As the population ages, another health concern that is emerging for veterans is the increased, although not certain, risk of dementia. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines dementia as part of a continuum of neurocognitive disorders; a mild neurocognitive disorder (NCD) consists of cognitive decline that does not interfere with one's ability to function independently, whereas a major NCD, one type of which is dementia, is a more severe decline (American Psychiatric Association, 2013). This leads to difficulty with memory, thinking, orientation, judgement, language, learning, and other cognitive skills (Reisberg, 2006). There may also be social, emotional, and functional challenges that accompany a dementia diagnosis, largely due to the prominent symptom of memory impairment (Alzheimer's Association, 2007; Reisberg, 2006). Symptoms of dementias can vary from person to person and from the different forms of dementia, but mental decline is generally enough to interfere with activities of

daily living. As the veteran population continues to grow and age, PTSD and dementias will both become more prevalent and effective services will become more necessary.

Prevalence of PTSD

In early studies of the Iraq and Afghanistan wars in 2003, 11-19% of deployed soldiers already displayed symptoms of PTSD, which is nearly twice the rate of civilians (Beidel, Stout, Neer, Frueh, & Lejuez, 2017; Finley, 2011; Menefee et al., 2016; Safir, Wallach & Rizzo, 2015). By 2009, the Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans with a provisional PTSD diagnosis totaled more than 22%, with one-third of OEF/OIF veterans with traumatic brain injury also having PTSD (Chapman & Diaz-Arrastia, 2014; Finley, 2011; Qureshi et al., 2010). Lifetime prevalence of PTSD in veterans is estimated as high as 31%, and is often more frequent and severe in infantry soldiers with high combat exposure (Bakalar, Blevins, Carlin, & Ghahramanlou-Holloway, 2016; Weiner et al., 2014).

As medical advances enable soldiers to survive through more traumatic war experiences, nearly four times the number of soldiers wounded in action come home with PTSD (Finley, 2011). The army diagnosed more than twice the number of veterans with PTSD in 2010 than it did in 2005; these numbers can be expected to continue increasing (Safir et al., 2015). It is important to think about the implications for clinical treatments and residential care facilities as this high proportion of veterans ages with such traumatic histories.

Some older veterans are already facing these issues. Between 9-15% of Vietnam veterans still suffer from PTSD 15 years after diagnosis, and if veterans from the Korean War and World War II are also considered, this statistic reaches 24% (Qureshi et al., 2010).

In a study of older veterans of Pearl Harbor, it was noted that 45 years later, 65% still experienced intrusive memories, 42% reported survivor guilt, and 33% reported symptoms of avoidance, hyperarousal, and emotional numbness (Averill & Beck, 2000; Wilson, Harel & Kahana, 1989). PTSD does not only develop from the combat of war, but also can also occur with sexual assault. Between 13-30% of female veterans report that they were raped during their service, with numbers averaging around 25% for sexual assault and 60% for sexual harassment (Finley, 2011; Safir et al., 2015).

While an extensive body of research has established that veterans face many kinds of traumatic experiences during their military service, much more needs to be undertaken to analyze the prevalence of dementia developing in people with PTSD, and how this large proportion of veterans with PTSD also handles a dementia diagnosis.

Prevalence of Dementias

Estimates of dementia in the population of people age 65 and older typically fall within 10-12% of the population, although risk of developing a form of dementia rises considerably with age (Alzheimer's Association, 2016). In addition to dementia, a mild cognitive impairment (MCI), which causes a minor decline in thinking and memory function and can evolve into dementia, is thought to affect 15-20% of adults over the age of 65 (Alzheimer's Association, 2012).

An additional concern is a diagnosis of cognitive impairment no dementia (CIND). Someone with CIND is 5-23 times as likely to progress to a dementia as someone without CIND, and one recent study revealed that approximately 18% of veterans had CIND (Holsinger et al., 2015). Other studies suggest that over one quarter of veterans over the age of 75 may have a form of dementia (Chodosh et al., 2007). Dementia diagnosis can be

difficult, however, and the patient can make it even harder. Almost half of veterans who screen positively for a dementia refuse further evaluation, and 27% feel that the time and effort it takes to schedule medical appointments is too great (Chodosh et al., 2007).

Screenings and diagnoses may be of particular importance for veterans who possess specific risk factors for certain dementias. There is some evidence discussed later in this paper about PTSD potentially increasing dementia risk. There is also evidence that approximately 20% of veterans from the Iraq and Afghanistan wars have experienced a traumatic brain injury (TBI), which can lead to a dementia (Bartzak, 2016; Tanielian & Jaycox, 2008). Veterans are also at increased risk for substance abuse, and it has been found that 40% of those with substance use disorders in surveyed VA nursing homes have a dementia as well (Lemke & Schaefer, 2010). Wernicke-Korsakoff syndrome, an alcohol-induced dementia, is worth watching for in veterans (Finley, 2011).

The Current Project

The aforementioned statistics and demographics regarding veterans with mental health issues inspired this project. The goal is to explore how aging veterans cope with PTSD in later life, especially when they have the potential to experience this in conjunction with a dementia. This project discusses symptoms and changes in neuroanatomy that are similar in both disorders, and a possible causal relationship. The collection of research presented should raise awareness of the disorders and therapy options, and the question of how to best provide care for older veterans with this unique set of memory-centered comorbidities.

Chapter 2: Literature Review

Theoretical Frameworks

The fields of gerontology and sociology have two theoretical frameworks that are particularly useful in understanding the impact of PTSD on the lives of older veterans. The first, cumulative disadvantage theory, suggests that earlier trauma may contribute to later problems, accumulating to establish a mindset of “prior vulnerability” and to have a strong negative impact on mental health functioning (Agaibi & Wilson, 2005; Sachs-Ericsson, Joiner, Cogle, Stanley & Sheffler, 2016; Schmied, Larson, Highfill-Mcroy & Thomsen, 2016). This phenomenon is also called the stress generation model; trauma often follows someone throughout their life course because psychiatric problems can contribute to actively creating more stressful life experiences (Schmied et al., 2016).

One longitudinal study of Gulf War veterans found that those with PTSD experienced higher rates of assault and injury, and a study of Vietnam veterans found that those with PTSD were more likely to die of external causes such as accidents or homicides (Schmied et al., 2016). The Post-Deployment Stress (PDS) study found that 16% of veterans had been robbed or had their house broken into since returning from deployment, 16% had witnessed an assault or death, and 12% had been assaulted themselves (Finley, 2011). Trauma may not end when a veteran returns from war; it could simply change forms.

A second theory, Tornstam’s theory of gerotranscendence, advocates a developmental shift in older age. This is a move toward internal values in three categories: the value of unity with the universe, less preoccupation with material objects and egotistical interests, and the increased importance of meditation time instead of social obligations (Buchanan, Ebel, Garcia, VandeNest & Omlie, 2016; Jewell, 2014; Read, Braam,

Lyyra & Deeg, 2014). A number of gerotranscendent attitudes, such as withdrawal and not seeing temporal boundaries between past and present, can be interpreted as pathological and are often seen in people with both PTSD and dementias (Buchanan et al., 2016). It may be unpleasant to review how one's life has developed if one has traumatic memories of the past, and it may be confusing to try to piece events together with little sense of a proper timeline. It is important for people with PTSD and dementias to be able to undergo a peaceful life review process, and to understand how to cope with symptoms and impacts of their conditions.

Coping Strategies

In some instances, as a possible counter to cumulative disadvantage theory and support for gerotranscendence theory, PTSD may not reduce an individual's ability to cope with trauma. The concept of post-traumatic growth is built around the idea that a difficult experience can alter someone's mental or psychological outlook in a positive manner, such as leading someone to appreciate their own strengths more (Finley, 2011). It is possible that surviving trauma can increase someone's confidence and recovery capital, defined as the intrapersonal and interpersonal supportive resources that facilitate natural recovery (Searby, Maude & McGrath, 2015). Even if this effect is not evident, there is sometimes at least a "steeling effect" in increased resilience (Agaibi & Wilson, 2005).

However, this positivity and growth may be more difficult for some older adults. Dementia can reduce an individual's ability to utilize previously successful coping skills, especially combined with stressful social changes such as retirement and perceived rolelessness (Grossman, Levin, Katzen & Lechner, 2004; Sachs-Ericsson et al., 2016). An older veteran who defined their self-image based on their military life may no longer be

able to see themselves in this way as their brains, bodies, and environments change. As one ages, there is an increased risk of experiencing depressing and disorienting incidences of physical and mental deterioration, new medical diagnoses, family deaths, and other stressors that can add up to take a toll on one's resilience (Dewey, 2004; Paulson & Krippner, 2007). It may be more difficult for an older veteran to summon the reserves of strength necessary to cope with PTSD, especially if they also have a dementia and cannot remember how they may have previously successfully coped (Finley, 2011). They may continue to face the same struggles several times as if each time is the first.

To add to this hardship, many veterans are not screened or treated for PTSD when they return from deployment. One study found that less than 10% of OEF/OIF veterans with PTSD completed the recommended number of treatment sessions in the first year of their diagnosis (Finley, 2011). It is imperative that veterans with PTSD deal with any emotional issues that negatively affect their quality of life, especially when aging may add more stress and inability to mentally process disturbing feelings and memories. Developing coping strategies should help to alleviate various symptoms.

Symptomatology of PTSD

PTSD was not formally included in the DSM until 1980 (Averill & Beck, 2000; Barnes & Harvey, 2000). In the DSM-5, there are four symptom categories outlined for PTSD: re-experiencing, avoidance, arousal, and negative cognitions and mood (American Psychiatric Association, 2013). Re-experiencing entails flashbacks and memories of the trauma, whether unprompted or triggered. Avoidance is the practice of trying to avoid these re-experiencing thoughts, feelings, and situations. Arousal refers to aggressive or reckless behavior and hypervigilance that may disrupt sleep. Negative cognitions and mood can be

viewed as a flip side to arousal, as this refers to estrangement and disinterest (American Psychiatric Association, 2013).

One symptom that is particularly troublesome for veterans is the arousal symptom of sleep difficulty. Research by psychiatrist van der Kolk beginning in the 1970s reveals that the nightmare content of some veterans with PTSD has stayed the same for 15 years, and in another study, nearly half of veterans reported problems getting to sleep or staying asleep (Finley, 2011; Naparstek, 2005). With regard to veterans attending treatment facilities, half were diagnosed with a form of sleep apnea and one quarter were diagnosed with insomnia, with 40% getting less than five hours of sleep each night (Yaffe, Hoang, Byers, Barnes & Friedl, 2014). At one mental health clinic, studies reported results as high as 80% of World War II veterans dealing with insomnia and 75% dealing with disturbing nightmares (Averill & Beck, 2000).

While these sleep symptoms appear relatively universal, other symptoms can be more specific to a veteran's combat situation. Soldiers who are more involved in combat tend to have more violent outburst symptoms, whereas soldiers who are only victims of violence have more memory problems (Naparstek, 2005). Those who have been prisoners of war can be more paranoid with less outward agitation; blank facial expressions called the "thousand yard stare" perhaps had survival value in prisoner of war camps (Dewey, 2004; Verma et al., 2001). Some other behavioral symptoms include a dulled sensitivity to loss, easy startling, and relationship difficulty (Barnes & Harvey, 2000). Veterans with PTSD recruited to take a learning test demonstrated a diminished ability to encode and consolidate new information, and had a delayed ability to recall known information, which often causes frustration (Yehuda, Golier, Tischler, Stavitsky & Harvey, 2005).

PTSD symptoms rarely disappear completely. Almost all veterans experience an anniversary reprise, meaning that around the same time of year as past traumatic events occurred, more symptoms reappear (Dewey, 2004). Current events can also influence the recurrence of symptoms. At the start of the Iraq and Afghanistan wars, the number of patients in PTSD clinics in VA hospitals quadrupled; many of these patients were Vietnam veterans whose PTSD reactivated with the deployment of new soldiers (Glasser, 2011). This remembrance of trauma does not have to be a wholly negative experience, however; it can be a chance to reconcile and move on.

Persistence and Reemergence of Trauma

In later life, some veterans reengage with their traumatic memories of war in an attempt to find meaning and build coherence (Davison et al., 2016). Others may be engaging for the first time. This delayed-onset PTSD (DPTSD) may be due to a reduction in physical and mental resilience over time, bringing suppressed memories to the forefront (Averill & Beck, 2000). Life course changes that lessen the effectiveness of coping skills, such as retirement and bereavement, may also lead to DPTSD in older veterans, because they may not have the recovery capital to cope with these changes (Averill & Beck, 2000; Davison et al., 2006; Sachs-Ericsson et al., 2016; Safir et al., 2015).

One longitudinal study conducted from 1982-2002 found that it took this period of 20 years for 13% of veterans to develop DPTSD (Safir et al., 2015). This finding may be influenced by this particular period in history, as DPTSD can be triggered by similar events; the Iraq and Afghanistan wars raise painful memories for veterans of previous wars. An average of 85% of veterans reported more preoccupation with war memories in later life,

and half reported having flashbacks when they had not had any before (Davison et al., 2006).

Two phenomena, late-onset stress symptomatology (LOSS) and late-adulthood trauma reengagement (LATR), describe reasons why older veterans may consciously choose to process traumatic memories decades after their war experience. LOSS and LATR are less strongly associated with mental health symptoms than PTSD, and more strongly associated with concerns about life course changes. Avoidance symptoms are one of the four critical categories for a PTSD diagnosis, whereas LOSS and LATR require intentional reminiscence in later life, when an individual possibly has more time for reflection (Davison et al., 2016).

Symptomatology of Dementias

Although the DSM-5 defines dementia as a major NCD, a form of severe cognitive decline in one or more areas, the specific symptoms can vary based on the type of dementia (American Psychiatric Association, 2013). In early stages of most dementias, people experience difficulty with memory and cognitive functioning, as well as some mood changes such as anxiety or depression. Memory problems are diagnosed with tests such as the Mini Mental State Examination (MMSE), Cambridge Cognitive Examination (CAMCOG), and psychological battery tests targeting language, abstract thinking, calculation, and attention (Van der Linde, Stephan, Matthews, Brayne & Savva, 2012). Cognitive and functional decline has also been associated with wandering.

Behavioral symptoms include sleep disturbances, outbursts, restlessness, delusions, and hiding or looking for things (Alzheimer's Association, 2007). The diagnostic criteria for psychosis of Alzheimer's disease consists of three types: agitation with or without

aggression, negative symptoms of apathy and avolition, and depression or hypersomnia (Van der Mussele et al., 2014). Not all dementia diagnoses require psychosis; however, it is important to note these “psychosis clusters,” as they do occur in up to 85% of cases and are identical to PTSD symptoms like hallucinations and paranoia (Van der Mussele et al., 2014).

The Geriatric Mental State Automated Geriatric Examination for Computer Assisted Taxonomy (GMS-AGECAT) provides a behavior symptom list including depression, apathy, anxiety, paranoia, irritability, agitation, and elation – in sum, any intense or rapidly fluctuating feelings (Van der Linde et al., 2012). The Neuropsychiatric Inventory (NPI), Neurobehavioral Rating Scale, Behavior Rating Scale for Dementia, and Behavioral Pathology in Alzheimer’s Disease Scale provide scores to indicate the severity of behavior symptoms (Van der Linde, Denning, Matthews & Brayne, 2013). Tests that analyze behavior are important because they are relatively easy to perform and repeat, whereas most dementias cannot be diagnosed or monitored based on the appearance of different brain regions. Nevertheless, there are certain key changes that can be observed biologically.

Biological Similarities of PTSD and Dementias

Various changes in neuroanatomical structure related to memory capacity and emotional responses are similar in both PTSD and many of the diseases that cause dementias. These include altered sensitivity of the hypothalamic-pituitary axis (HPA) system, reduced hippocampal volume, and cortical abnormalities. These commonalities suggest a link between PTSD and dementias.

The glucocorticoid cascade hypothesis explains changes in the HPA system. Stress activates the HPA system for prolonged periods of time, leading to oversecretion of glucocorticoids that damage the hippocampus. Exposure to stressors, as in cases of PTSD,

heightens the sensitivity of this system to stress and therefore causes more hippocampal decline, specifically in the subiculum and dentate gyrus subfields (Greenberg, Tanev, Marin & Pitman, 2014; Sachs-Ericsson et al., 2016). This hyperresponsiveness has also been tied to agitation and psychosis in dementias (Verma et al., 2001; Yaffe et al., 2010). Stress also plays a role in elevating the production of pro-inflammatory cytokines, which induces neuroinflammation (Greenberg et al., 2014). A greater degree of inflammation has been correlated with earlier onset of Alzheimer's disease, and impairs the ability to store new memories (Greenberg et al., 2014).

Studies have reported either left, right, or bilateral hippocampal volume reduction ranging from 5-26%, on a scale where a reduction of 40% is thought to reflect complete neuron loss (Qureshi, 2010; Safir et al., 2015). This results in short-term memory working only at half capacity in the most severe cases, while long-term memories remain intact. For a veteran with PTSD, this reliance on long-term memories that contain their trauma could be very distressing (Grossman et al., 2004). For a veteran who already had some hippocampal volume reduction from PTSD, a possible further reduction from a dementia is even more worrisome.

Those with PTSD have also been shown to have reduced anterior cingulate cortex (ACC) gray matter volumes and hypoactive medial prefrontal cortexes (MPFC), cortical changes which are also present in dementias (Safir et al., 2015; Zhou, Chu & Luo, 2011). Cortical systems are supposed to regulate the emotional responses of the amygdala, but this lessened cortical activity means that the amygdala is hyperresponsive. This could cause many of the emotional symptoms in PTSD and dementias (Costanzo, Jovanovic, Norrholm, Ndiougue, Reinhardt, & Roy, 2016).

Possible Causal Relationship of PTSD and Dementias

PTSD and dementia-producing diseases can be conceptualized as memory disorders with changes in not only memory but also attention, learning, and executive functioning. Qureshi (2010) conducted an 11-year study using administrative data from the Veterans Integrated Service Network (VISN) to gather four groups of veterans: those with no PTSD and no Purple Heart; those with PTSD and no Purple Heart; those with no PTSD and a Purple Heart; and those with PTSD and a Purple Heart. Veterans with PTSD were found to be twice as likely to develop a dementia compared to those without PTSD, and having a Purple Heart had little influence. This suggests that PTSD is a greater risk factor for dementias than trauma that is specifically combat-related, since Purple Hearts are awarded for combat experiences. Yaffe (2010) conducted a similar study and reached the same conclusion, that veterans with PTSD are twice as likely to develop a dementia, and Meziab (2014) and Weiner (2014) bolstered these findings more recently. One study even found a fourfold increased risk (Wang et al., 2016). This further suggests that the results would be similar if the PTSD were induced by a non-war experience such as sexual assault, as it is the disorder and its symptom set that appears to lead to greater incidence of dementias. More definitive studies still need to be conducted in these areas.

Further research could also be useful for the population of prisoners of war. One study concluded that nearly one-third of prisoners of war also had PTSD, and the incidence of a dementia was 31.6% in prisoners of war versus 19.5% in non-prisoners of war (Meziab et al., 2014). There has been found to be more than a 50% increase in the risk of a dementia in veterans with prisoner of war status alone, and more than a 75% increased risk in veterans with PTSD alone (Meziab et al., 2014).

Sleep studies have yielded some interesting information about PTSD and dementia similarities as well. Sleep-disordered breathing, altered circadian rhythm, and decreased slow-wave sleep, which commonly occur with PTSD, are also associated with increased risk of a dementia (Mohlenhoff, Chao, Buckley, Weiner & Neylan, 2014; Yaffe et al., 2014). One study found that worse insomnia was tied to smaller hippocampal volume (Mohlenhoff et al., 2014). Trauma reenactments suggest a relationship with rapid eye movement behavior disorder (RBD) and association with Lewy body dementia (LBD) because of visual hallucinations (Dallam, Mellman, Bhatnagar, Nguyen & Kurukumbi, 2011). Other types of dementia can have their own specific risk factors as well. For example, people with PTSD tend to have higher incidences of hypertension and diabetes, which could develop a predisposed pathophysiological pathway to vascular dementia (Greenberg et al., 2014).

These similarities in symptomatology and neuroanatomy, and the possible causal link, make PTSD and dementias important conditions to study in tandem. The prevalence of these conditions and the growing population of afflicted veterans means that services must be streamlined, effective, and readily available. Gaps in services must be identified and filled so that each veteran's care can be well-rounded and complete.

Current VA Services for PTSD and Dementias

Dementia is one of the most costly chronic conditions that the VA treats, and older people's concerns about memory loss receive limited physician attention (Chodosh et al., 2007). The Veterans Health Administration recommends that veterans should be periodically screened for depression and PTSD, but the push for cognitive impairment tests is less intense (Préville, 2015). Some VA facilities have developed specialized dementia care

programs, both inpatient and outpatient, to establish a baseline balance for behavioral issues to enable veterans to better manage their illnesses on their own.

The Office of Geriatrics and Extended Care (OGEC) directs many care programs, one of which is the Advances in Home-Based Primary Care for End of Life in Advancing Dementia (AHEAD) training program (Cooley & Asthana, 2010). However, these initiatives mostly focus on veterans who live in their homes, and they also only focus on dementias rather than how this cognitive degeneration works with other comorbidities like PTSD. One project is meant to highlight the differences between dementia, delirium, and depression, which is beneficial, but still does not include PTSD.

Another VA training program is Staff Training in Assisted Living Residences (STAR), which focuses on identifying and changing the environmental and personal causes of certain behavior, increasing individually pleasurable activities, and having realistic expectations and communication strategies to listen to and provide what resident veterans need (Karel, Teri, McConnell, Visnic & Karlin, 2016). These types of interventions would clearly benefit residents, and should also help staff understand why residents are exhibiting certain behaviors.

The Joint VA and Department of Defense Evidence-Based Practice Workgroup recommends four therapies for primarily treating veterans with PTSD: prolonged exposure therapy (PE), cognitive processing therapy (CPT), stress inoculation training (SIT), and eye-movement desensitization and reprocessing therapy (EMDR) (Steenkamp & Litz, 2013). Between 2006-2008, the VA mandated that PE and CPT made available to all veterans with PTSD (Lu, Plagge, Marsiglio, & Dobscha, 2016; Menefee et al., 2016; Steenkamp & Litz, 2013). By 2009, all VA medical centers offered at least one of the two therapies, with 72%

offering both; this percentage grew to 98% offering both by 2012 (Lu et al., 2016; Steenkamp & Litz, 2013). Now that these therapies are widely available, more studies need to be conducted to demonstrate their effectiveness.

Value of Therapeutic Approaches

Treatment and management of PTSD should target an individual's needs, which is often accomplished by focusing on each individual's unique trauma. Prolonged exposure therapy requires that participants re-imagine and confront the details of their traumatic memories. This is a popular treatment style for PTSD because of its potential to reduce or eliminate fear responses; however, other symptom categories remain unaddressed, and 20-50% of exposure therapy participants still meet the diagnostic criteria for PTSD after completing treatment (Dutton, Bermudez, Matás, Majid & Myers, 2013; Steenkamp & Litz, 2013). For one study on CPT, of which PE is only one type, up to 60% of therapy participants still met PTSD criteria after completion, and 70% met PTSD criteria at a one-month follow-up (Steenkamp & Litz, 2013). It is important that these follow-ups be done to ensure that symptom relief is not only temporary. As the research currently shows, the two therapies that the VA is mandated to offer are generally not enough to treat PTSD by themselves in the long term.

Other therapies may be needed to complement CPT and address other symptoms. For example, mindfulness-based stress reduction therapy (MBSR) teaches attention focusing skills and emotional consciousness, with the intent of helping the participant handle moment-to-moment sensations in the present rather than digging into the past details of the trauma story (Dutton et al., 2013). The central MBSR components of body scanning and meditation challenge people with PTSD to sit still and concentrate for long

periods of time, but this discipline assists in managing agitation (Dutton et al., 2013).

Participants in one study described decreased distress and anger, decreased avoidance of thoughts and feelings, and increased awareness, empowerment, focus, and belonging (Dutton et al., 2013).

MBSR could prove especially useful for veterans who also have a dementia, due to its emphasis on symptom relief and behavioral improvements in the present moment, with no reliance on specific past memories. It has been shown that CPT and PE have been beneficial for veterans with PTSD, but many trials have excluded veterans with other psychiatric comorbidities such as dementias (Menefee et al., 2016). Processing traumatic memories may be too much for someone with a dementia, and could only exacerbate feelings of distress and anxiety.

Repetitive transcranial magnetic stimulation (rTMS) has also been studied in veterans with PTSD when other treatment methods are not enough. This therapy uses an electric coil to depolarize neurons in the left dorsolateral prefrontal cortex (DLPFC), at a low frequency that does not cause seizures or other brain damaging effects (Bartzak, 2016). Veterans using rTMS have improved their scores on the Beck Depression Inventory, Beck Anxiety Inventory, and Impact of Events Scale – Revised (IES-R), and have demonstrated decreased hypervigilance and fear responses (Bartzak, 2016).

Trauma management therapy (TMT) was developed in the 1990s as a form of intense exposure therapy that also includes group sessions for social and emotional needs (Beidel et al., 2017). TMT aims to teach veterans coping skills, anger management, maintaining social involvement, and aspects of the sleep cycle, with the goal of improving symptom control and interpersonal relationships (Beidel et al., 2017). Trials of TMT in

Vietnam veterans in 1996 and 2011 reported decreased PTSD symptoms including anxiety and increased participants' frequency and duration of social interactions (Beidel et al., 2017). These generalized results from large trials are highlighted in individual case studies to more clearly show how impactful these therapies are.

Case Studies

One 2013 case study, researched by Duax, Waldron-Perrine, Rauch, and Adams, follows a Vietnam war veteran with PTSD referred to as Mr. C. His symptoms were connected to witnessing "the unloading and preparation of deceased soldiers' bodies" (Duax, Waldron-Perrine, Rauch & Adams, 2013). During his prolonged exposure therapy (PE) treatment, Mr. C reported being "less scared" of his memories and having better grounding in reality when he flashed back or re-imagined the traumatic incident (Duax et al., 2013). His neuropsychological assessment battery after one year of treatment showed only one of eight emotional distress scales elevated, compared to seven of eight emotional distress scales before treatment (Duax et al., 2013). His language and knowledge test scores improved, perhaps due to decreased anxiety; his memory function appeared unchanged, remaining poor; and his visuospatial, attention, and executive functions declined, perhaps attributed to cerebrovascular issues (Duax et al., 2013). Overall, PE seemed to improve Mr. C's PTSD symptoms.

There have been a few case studies analyzing how to fortify socialization and relationships among veterans who have experienced sexual assault. Nearly 22% of women studied reported MST when screened by the VA (Cloitre, Jackson & Schmidt, 2016). Skills Training for Affective and Interpersonal Regulation (STAIR) is a type of CPT focusing on

building skills to manage emotions and maintain healthy relationships, and this approach is one of the frontline choices for treating PTSD (Cloitre et al., 2016).

The first of three STAIR case studies deals with Kathy, a Navy veteran who experienced child abuse and then military sexual assault. She reported the crime and was eventually discharged due to a “personality disorder.” Her goals under the STAIR therapy program were to learn how to identify, express, and manage her emotions, so that she could engage more in social activities. Kathy was able to increase her socialization, view herself more positively, and see that others view her positively too. She was able to reduce her PTSD score from 77 to 46 in her first ten weeks of therapy (Cloitre et al., 2016).

A second STAIR case study was conducted with Barbara, with a focus on narrative therapy. Barbara was bothered by deteriorating family relationships, and wanted to increase her awareness of her emotions and communication skills. After reviewing her traumatic past with a therapist over ten weeks, Barbara reduced her PTSD score from 77 to 38, disclosed her sexual assault to her husband and the VA, and joined an advocacy group (Cloitre et al., 2016).

The final STAIR case was done with a male Army veteran, Stephen, who experienced a sexual assault thirty years prior to starting therapy. His goal was anger management, and the key to his recovery was acknowledging the link between his abuse and his anger. He had joined the military to escape abuse at home, only to experience more trauma, and he felt betrayed. Through role-playing and schema replacement – changing his beliefs from “if I open up, I’ll be betrayed” to “if I ask for help, I can get better” – Stephen dropped his PTSD score from 75 to 43 after sixteen weeks (Cloitre et al., 2016).

It is evident that different kinds of therapies work for different kinds of people who have PTSD, depending on their particular traumatic circumstances. The next section of this paper should provide some insights into how therapies can further be developed and offered to veterans for their specific needs.

Chapter 3: Potential Future Research

Target Audience

The following information is intended for those who wish to know what might be done to improve various areas of PTSD and dementia research, and how to better care for those who have these disorders. These research areas include diagnostic, therapeutic, economic, and behavioral considerations for this population of older adults. These research avenues should be especially beneficial for any health care providers such as long-term care workers, who can expect to deal with an increase in the population of residents with PTSD and dementia. Whether or not one is affiliated with the VA should not affect the high value of thinking about how to improve current processes.

Screening and Initial Treatment

While the STAR-VA program is predominantly a training program for existing staff, there are two other models that outline different care providers and plans that would be beneficial for older adults with PTSD and dementias. The Improving Mood – Promoting Access to Collaborative Treatment (IMPACT) model has five components: “(1) a depression care manager, (2) a designated psychiatrist, (3) collaborative care between the patient’s primary care physician, care manager, and psychiatrist, (4) outcome measurement of depressive symptoms, and (5) a stepped care model for implementing a treatment plan” (Rybarczyk et al., 2013). The Prevention of Suicide in Primary Care Elderly – Collaborative Trial (PROSPECT) model has one health specialist working with the primary care physician to monitor and manage suicidal ideation (Rybarczyk et al., 2013). The Geriatric Suicide Ideation Scale (GSIS) could also be implemented if necessary, as it has been effectively

applied to broad groups of older adults in community settings and could provide valuable insights in residential care facilities as well (Heisel, 2016).

The Clinician Administered PTSD Scale (CAPS) and the Repeatable Battery for Assessment of Neuropsychological Status (RBANS) can be useful in evaluating how symptoms fluctuate over time (Sani et al., 2012). This can aid health care providers in determining which medications may be helping or hindering someone's recovery process; for example, memantine is a common medication for Alzheimer's disease, the most common dementia, but more research needs to be done on how it affects PTSD and whether it would be an effective treatment for a veteran dealing with both conditions (Sani et al., 2012).

Specialized Populations

The differences in PTSD treatment among different genders should be studied more in the future. Historically, female veterans have numbered less than 5% of the total veteran population, so VA inpatient psychiatric units proportionally reserve fewer beds for women (Menefee et al., 2016). Research must be done on how to increase safe spaces and treatment programs for women to take into account their unique experiences. Two gender-specific inpatient treatment programs have been studied, but should be studied more extensively: Returning OEF/OIF/OND Environment of Recovery (ROVER) for the men, and the Women's Inpatient Specialty Environment of Recovery (WISER) for the women (Menefee et al., 2016). These ROVER/WISER initiatives were focused on building coping and interpersonal skills under Herman's model of recovery, which targets three stages of safety, remembrance and mourning, and reconnection to self (Menefee et al., 2016). It

should be investigated how men and women compare in their progressions through these stages.

PTSD treatments should also be investigated in suicidal individuals. Suicide rates for the U.S. Army surpassed national rates for the first time in 2008, due to OEF/OIF veterans returning with PTSD (Bakalar et al., 2016). Nearly 40% of studies that have been done on exposure therapies have not mentioned inclusion criteria regarding suicide risk, what level of risk might be acceptable to participate in the study, and how suicidal participants were monitored for safety throughout the process (Bakalar et al., 2016). Certain components of exposure therapy might be too stressful for suicidal individuals who cannot handle reliving their trauma, and offering them more support might compromise the control of the study, so various therapy methods should be tried to address the unique needs of this population. It would be beneficial for therapy studies to be conducted in psychiatric inpatient settings and also long-term care settings.

Long-Term Care Implications

Nursing homes are required by law to divulge the prevalence of behavioral symptoms for all of their residents each quarter using the Minimum Data Set (MDS), but these reports only need to include behaviors shown within the week before submission (Powers, Gwirtsman & Erwin, 2014). Perhaps future studies could determine whether this time frame encompasses enough data to provide an accurate portrayal of residents with PTSD and dementias. This could help staff better track the frequency and emergence of behavioral issues that might need addressing more often.

One specific behavior of concern is wandering. In one initial study, one-fifth of older adults admitted to a nursing home with cognitive impairment diagnoses wandered, and

half of the residents who did not have a dementia but did have a psychiatric diagnosis also wandered (Molinari, King-Kallimanis, Volicer, Brown & Schonfeld, 2008). Wandering with a psychosis, such as PTSD, could suggest increased motor activity associated with ineffectively treated delirium or alarm symptomatology (Molinari et al., 2008). Veterans with PTSD have not been definitively determined to exhibit more aggression to other residents, but they may be more paranoid, particularly former prisoners of war (Ball et al., 2009). Combined with the prevalent sleep disturbances that plague veterans with PTSD, there may be more frequent nighttime wandering if there is an inability to sleep and disorientation with time.

It is imperative that staff members be able to manage this wandering behavior to ensure safety. In one small nursing home in Australia, there are four units around a central room, and residents who wander into the central room are permitted to stay and relax where a nighttime staff member can supervise (Cohen-Mansfield & Bester, 2006). This idea of allowing non-harmful behavior rather than forcing residents to conform to a certain schedule could help residents feel more calm and at home. This creates a dementia-friendly environment, in which the entire design of a facility incorporates openness and light for fall prevention and overall safety (Davis, Byers, Nay & Koch, 2009). Perhaps larger studies could be done to see if this layout would be beneficial if widely replicated, especially alongside other therapies and means of support.

Increasing Support and Therapy Adherence

One study showed that many Vietnam veterans who attended veteran support group meetings thought that they were helpful in both processing memories and also maintaining fellowship; however, many WWII veterans did not place the same value on

such support groups, perhaps because they had the support of their own country when they went to war (Barnes & Harvey, 2000; Brown, Knapp, Grubaugh, & Acierno, 2016). OEF/OIF veterans have reported higher PTSD severity than veterans of other wars, particularly in the avoidance and hyperarousal symptom categories, but it is important to consider that OEF/OIF veterans might be overrepresented in study samples as veterans of previous wars are more likely deceased (Brown et al., 2016). More in-depth analysis considering social variables could possibly uncover trends to see which groups of veterans might benefit from different support styles.

It is necessary to analyze not only what populations might utilize one form of treatment, but also how and why those treatments work, and how to increase adherence to treatment programs. One study estimated that only 58% of OEF/OIF veterans with PTSD have used VA PTSD services, and only 38-45% expressed interest in therapy, with 67% refusing or feeling ambivalent about therapy referrals (Steenkamp & Litz, 2013). Of those veterans who accepted referrals, one quarter did not attend the initial therapy session, and another quarter did not attend a second session (Steenkamp & Litz, 2013). Adequate treatment for PTSD is generally considered at least eight or nine sessions in a year, and one CPT study had only 8.5% of patients complete it (Lu et al., 2016). Another study found that OEF/OIF veterans had the highest dropout rate of all veteran cohorts, despite the treatment being equally effective across the cohorts (Brown et al., 2016).

Another aspect of this issue is making sure that the services are accessible, in terms of both location and cost. One way to encourage veterans to utilize services is to ensure that they can get to them and not spend all their income on them; currently, PTSD treatments and therapies are difficult to access for many (Dutton et al., 2013). Most

available PTSD treatment programs provide services once per week, which prolongs treatment over multiple months, and it is difficult for active duty personnel to be relieved from duty for so long (Beidel et al., 2017). Overcoming geographical and financial barriers to care should be a growing research area in the upcoming years.

Biology and Traumatic Brain Injury

More research on biological networks between PTSD, dementias, and their underlying issues should be conducted as well. The Alzheimer's Disease Neuroimaging Initiative (ADNI) is a large public-private partnership that aims to validate imaging and biomarkers for Alzheimer's clinical trials (Weiner et al., 2014). More research could be done on how the apolipoprotein E4 allele may worsen the severity of Alzheimer's, and more epidemiologic studies could be done to more clearly link Alzheimer's with traumatic brain injury (TBI) (Weiner et al., 2014). It has been found that TBI may be associated with earlier onset of Alzheimer's, and Alzheimer's characteristic plaques and intra-axonal beta amyloid deposits have been found in one-third of a group of people with TBI (Weiner et al., 2014). Nonblast-related TBI has been associated significantly with concentration and memory problems, and blast-related TBI has been found to have more PTSD symptoms overall compared to nonblast-related TBI (Chapman & Diaz-Arrastia, 2014). While only 11.8% of veterans are diagnosed with TBI alone, the majority (70%) are diagnosed with both TBI and PTSD (Seal et al., 2016). The most frequent symptoms reported from veterans with TBI are forgetfulness (77%) and poor concentration (71%), both of which are associated with PTSD and dementias (Seal et al., 2016). More concrete connections are needed in order to make sense of the complexities within these associations.

In addition to all of the future research avenues needed to continue investigating the biological and treatment areas of dementia and PTSD, more research needs to be done about how health care costs will be affected (Sibener et al., 2014). One study found that the median annual health care costs for veterans with TBI are four times higher than costs for veterans without TBI, and costs are even higher for veterans with both TBI and PTSD, which could increase probability for needing dementia care as well (Sibener et al., 2014). Traumatic brain injury can predispose people to develop a tauopathy-related dementia at an early age, similar to Alzheimer's disease but with a different pattern of phosphorylated tau deposition that has not yet been explored in-depth (Sibener et al., 2014).

In conclusion, knowledge gaps must be addressed at all levels and in all fields, from neuroscience to economics, in order to create a well-rounded system of care for aging veterans. Many veterans are facing diagnosis with neurodegenerative diseases at early stages of life, perhaps on average in their forties, and these veterans can be expected to live another forty years beyond that, which will greatly increase long-term care, hospice, and therapy demands and expenses (Sibener et al., 2014).

Reference Sheet: A Quick Look at PTSD and Dementia

Post-Traumatic Stress Disorder (PTSD): a mental health condition that may develop when a distressing event occurs and induces symptoms such as intrusive thoughts, hypervigilance, panic attacks, or flashbacks.

Symptoms include:

- flashbacks and memory problems
- negative mood – disinterest, recklessness, aggression
- sleep difficulty
- hypervigilance
- avoidance

Dementia: part of a continuum of neurocognitive disorders (NCDs); a major NCD characterized by severe cognitive decline in one or more functional areas.

Symptoms include:

- difficulty with memory, cognition, and language
- rapidly fluctuating or intense emotions – anxiety, depression
- diminished attention span and abstract thinking
- more specific symptoms based on type of dementia

Recent Research Highlights:

- PTSD potentially doubles the risk for dementia
- biological similarities in PTSD and dementia – brain changes in HPA, hippocampus, and cortex

Future Research Needs:

- which therapeutic approaches work best for which populations
- how to increase adherence to therapy programs, and reduce financial and geographical barriers to access
- how PTSD and dementia incidences will affect health care costs
- how to improve early diagnosis and treatment, and improve long-term care facility environments

Key Resources:

- Alzheimer's Association – <https://www.alz.org>
- Dementia resources by state - <https://www.alzheimers.net/resources/>
- National Center for PTSD - <https://www.ptsd.va.gov>
- PTSD Alliance - <http://www.ptsdalliance.org/resources/>

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