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Impact of Traumatic Brain Injury on Mindfulness in Veterans who have
PTSD

by

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MSW Clinical Research Paper

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Master of Social Work

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The Clinical Research Project is a graduation requirement for MSW students at St. Catherine University/University of St. Thomas School of Social Work in St. Paul, Minnesota and is conducted within a nine-month time frame to demonstrate facility with basic social research methods. Students must independently conceptualize a research problem, formulate a research design that is approved by a research committee and the university Institutional Review Board, implement the project, and publically present the findings of the study. This project is neither a Master's these nor a dissertation.

Abstract

Traumatic brain injury (TBI) and post traumatic stress disorder (PTSD) have had a negative impact on a significant amount of veterans who have returned from Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Mindfulness practice has proven to be an effective means to increase the quality of life (QoL) for many who have been impacted by TBI or PTSD. This study intended to examine the exact implications that having a TBI has on improving the QoL through mindfulness for veterans who have PTSD and TBI. This was a qualitative study of four professionals in the areas of TBI; PTSD; mindfulness practice; and/or work with veterans who have experience with any of the above. The study highlights the challenges that professionals face when working with an invisible wound; qualities of effective mental health workers when working with TBI; and the positive impact that mindfulness practice can have on this population.

Review of the Literature

Combat-related PTSD and blast-induced TBI

With service members surviving injuries that would have been fatal in previous theaters come a new set of issues. Veterans who have returned from the Iraq and Afghanistan theaters have experienced injuries, both physical and psychological, that are unique when compared to veterans of previous conflicts. This is in part due to the increase in protective equipment that service members have been issued and able to utilize a decrease in response time to higher echelons of care improving the likelihood that the injured will be stabilized and treated for shock.

Significance of combat related PTSD

The traumatic psychological effects of warfare with the American military has been recorded dating back as far as the Civil War (Packnett, Gubata, Cowan, & Niebuhr, 2012). According to James, Strom, & Leskela (2014) 12 to 20% of military personal meet the criteria for PTSD. According to Kearney (2012), PTSD confers a greater significant lifetime risk of suicide than any other anxiety disorder, and also has a greater effect on a person's QoL than major depressive disorder and obsessive-compulsive disorder.

Battlefield PTSD is an anxiety disorder that may occur soon or develop gradually after exposure to a highly dangerous, terrifying and possibly life-threatening traumatic event (such as an improvised explosive device bomb blast in combat operations or terrorist attacks. Patients sustaining PTSD have persistent re-experiencing symptoms (flashback memories, recurring distressing memories or dreams and frightening thoughts), avoidance symptoms (feeling emotionally numb, losing interest in any activities, memory loss, attention deficits and depression) and hyperarousal symptoms (sleep difficulties, aggression and anxiety). (Chen, Huang. 2011, p. 642).

A unique aspect to combat related PTSD is that it can be the result of learning about an event that caused a loss of consciousness. The event that is responsible for the PTSD symptoms can precede or take place after the loss of consciousness. It is also possible to experience PTSD after learning the details of the traumatic event while the veteran is recovering (Burke, 2009).

PTSD can present itself through the experience of multiple symptoms. The psychological maintenance of PTSD symptoms can take place through active avoidance and suppression of painful emotions and memories (King, more, 2013). It is clinically characterized by recurrent, intrusive recollections of a traumatic event, persistent avoidance of internal and

external cues that trigger re-experiencing, emotional numbing, and hyper-arousal. These symptoms can persist for decades (Kearney more, 2012).

There have been great advances in the treatment of PTSD symptoms. According to King (2013), the best results have been noted to be in response to exposure therapy. Exposure therapy is a form of re-experiencing the traumatic event in a safe and controlled environment. It is meant to strip away the negative emotions and connotations that are associated with the traumatic event so that the person with PTSD will be more capable of identifying triggers as they take place, recognizing that they are not necessarily in a threatening environment, and practicing various and appropriate coping skills. The person receiving exposure therapy is required to experience an amount of stress that is associated with the traumatic event.

Significance of veteran TBI

TBI takes place after an insult to the head. This can be in the form of a concussive; closed; or a penetrating injury (Burke, 2009). When discussing a TBI as the result of a blast Chen & Huang (2011) explain the injury as being from: “Direct cranial transmission, skull flexure, and head acceleration were considered as the possible mechanical mechanisms by which the blast over-pressure wave may cause mild TBI” (p. 643).

The most common source of physical injury related to combat in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) comes from the improvised explosive device (IED). TBI ranges in severity from mild to severe. The symptoms related to TBI are in the areas of cognitive; somatic; and behavioral problems; including concentration; attention; and memory setbacks; sleep dysfunction; headache; anxiety; depression; and irritability (Burke, 2009).

Of veterans returning from OEF/OIF, it is estimated that 12 -23% report history of in-theater concussion with as many as 300,000 OEF/OIF personnel sustaining a combat related concussion (Nelson et al., 2011).

Due to the nature of explosions, the modality of injury can be broken down into four different modes of effect: primary, secondary, and tertiary (Taber, Warden, & Hurley, 2006; Warden, 2006; Burke, 2009) and quaternary (DePalma, Burriss, Champion, & Hodgson, 2005; Burke, 2009). Primary injuries refer to the wave induced changes following rapid adjustments in atmospheric pressure, resulting in the body possibly being damaged in the air-fluid interfaces, such as the lungs, bowels, or the middle ear. Secondary injuries result from objects being propelled through the air and striking the person. Tertiary injuries result from the person striking an object or hitting the ground and quaternary injuries are the result of the worsening of a preexisting condition that was initially acquired from the blast (Burke, 2009).

Given the complexity in the nature of a blast injury, it is easy to understand that it is estimated that 60-80% of those who experience a blast via IED attack also acquire a TBI. Many service members who would have been killed in previous conflicts are now surviving due to the advances made in battlefield medical care, protective equipment and increased evacuation times. Taking a look back to see how injuries compare to past conflicts, it is estimated that in Vietnam 16% of veterans who were wounded had injuries that included the head or neck (not necessarily TBI). In WWII and Korea that number increased to 21%. In OEF/OIF the percentage of injuries that included the head or neck are approximately 30% (Summerall, 2008; Burke, 2009). Further studies have shown that troops who have survived a blast in Iraq have also have experienced elevated rates of PTSD (Burke, 2009).

The significance of TBI has coined it as the signature injury of OEF/OIF. The increase in head injuries presents a complicated array of issues for veterans. Those who have been in a blast need to be examined in order to ensure that veteran who has possibly sustained a TBI can experience the highest quality of life possible while recovering from their injuries and after they return to their respective communities.

Comorbid PTSD and TBI

The presence of both PTSD and TBI has shown to be significant in veterans who have returned from the OEF/OIF theaters and exasperates many of the challenges that are common within the veteran community. According to the National Center on Posttraumatic Stress Disorder 60-80% of all soldiers who experience an attack with an IED and are in the area of the blast also acquire a TBI (Summerall, 2008).

It is worth noting that among service members who are still in active duty, but have experienced battlefield trauma, face a different set of challenges. “Engagements in hazardous and disruptive behavior are frequent symptoms causing service members impacted by TBI and/or PTSD to incur criminal and legal problems, which can lead to a dishonorable military discharge” (Burke, 2009, p.7).

The Brain

When examining the effects PTSD and TBI have on service members who have been exposed to a blast while in combat, it is valuable to give attention to the physical changes that take place in the brain. It is easy to acknowledge that a traumatic brain injury changes the physical make-up of the brain; it is just as reasonable to assess the changes that take place in the brain as a result of PTSD and the factors that influence the effect that PTSD has on a person’s life. Many who have studied PTSD and combat trauma argue that these conditions do not exist

in a vacuum and that other life experiences – either good or bad, recent or long past – influence neural development and post-traumatic behavioral responses (Aupperle, Connolly, Stillman, May, & Paulus, 2013).

Blast-induced neurotrauma (BINT) is the trauma that takes place in the event of a blast. The nature of this injury is that it is invisible to others; it affects mood; thoughts; and behavior. Due to these essence of BINT, it is often unrecognized, unacknowledged, and underdiagnosed (Ruff, Riechers, Wang, Wang, & Ruff, 2012). Professionals in the brain injury field have identified BINT as an emerging subspecialty of TBI. The manifestation of symptoms without any external injury or structural damage that can be visually located through imaging has created a demand to investigate the potential issues surrounding this injury.

The scarcity of scientific studies on BINT's prevalence, neuropatho-physiology, presenting symptoms, short- and long-term outcomes is problematic for military clinicians and leaders in terms of diagnosis, treatment, and coordination of care across multiple agencies and specialties. Experts agree that this new phenomenon, if untreated, will lead to future healthcare costs, long-term disability, and loss of productivity for these young adults and may negatively affect society as well (Defense and Veterans Brain Injury Center [DVBIC], 2006; Tanielian & Jaycox, 2008).

The lack of apparent physical trauma has resulted in service members not seeking medical treatment in fear of being ridiculed or punished for seeking treatment because of military stigma and/or because of clinicians' lack of awareness of this phenomenon. When a service member avoids seeking treatment medical problems escalate, which can often result in a second impact injury. Subsequent brain injuries increase the severity of trauma. This situation may not only lead to increased healthcare costs; long-term disability; and loss of productivity; but also the

service members potential for isolation; job failure; depression; substance abuse; further injury; suicide; criminal violence; and homelessness (Ruff, Riechers, Wang, Wang, & Ruff, 2012). The reason for these outcomes have been attributed behavioral changes. “Afflicted individuals may behave inappropriately, or not as expected, because they are unable to receive, store, process, accumulate, or retrieve information effectively. Sensory input can be unreliable, and they may have difficulty processing information” (Ruff, et al., 2012, p. 240). These challenges can be impart due to the transitional changes that a person who received a BINT experience. “Service members with undiagnosed BINT may exhibit a lack of inhibitions that results in difficulty adhering to social rules, inability to perceive interpersonal cure, aggression, violence against themselves or others, or adverse reactions to stressful or demanding situations. Furthermore, the service member may have limited awareness of changes in his / her behavior and / or intensifications of some preexisting problem behaviors” (Ruff, et al., 2012, p. 240).

The brain and PTSD

The brain has an immediate effect on the body physically, emotionally, and mentally. Taking a more in-depth examination of how the brain is changed by the trauma will increase the understanding of how a person will react to the different components of PTSD as well as how they will respond to different treatments.

Gupta (2013) performed a detailed study of symptoms of PTSD and how the related specifically to the brain regarding its structural and functional capacities of fear conditioning and extinction. The major structures within the brain that are affected by PTSD are the Amygdala; medial prefrontal cortex; anterior cingulate cortex, hippocampus; and the anterior insula. Gupta (2013) gives a short explanation of these structures and how they interact with PTSD symptoms. The amygdala is involved with assessing for potential threats or ambiguity in the environment,

and also plays a key role in fear conditioning; fear memory; and autonomic nervous system activation. The medial prefrontal cortex adaptively maintains extinction of conditioned emotional responses once the traumatic experience is no longer relevant and down-regulates emotional activity in the amygdala. The anterior cingulate cortex modulates sympathetic and neuroendocrine responses. The hippocampus utilizes cues within the environment to signal safety. It regulates the expression of fear and fear extinction memories by evaluating the context within the fear stimuli. It is also involved in the encoding of both emotional and neutral memories. The anterior insula is involved in perception of a wide range of internal body states or interoception, and likely plays a central role in the pathogenesis of somatoform and ill-defined symptoms in PTSD. The basis of all subjective feelings from the body comes from the insula. It contains interoceptive representation of all experiences and is activated in association with bodily, sensory, and emotional feelings (Gupta, 2013).

Resiliency and risk factors

Many resiliency and risk factors have been directly related to changes in brain structure. “Greater understanding of how these risk and resiliency factors relate to structural brain differences could provide insight concerning the development of post-traumatic mental health symptoms and potential strategies for prevention and treatment” (Aupperle, Connolly, Stillman, May, & Paulus, 2013, p. 2). In a study performed by Aupperle, et al., (2013) they found evidence that both negative (i.e., combat experience) and positive (i.e., unit support) deployment-related experiences relate to regional brain volume. The gray matter area of volume of the brain is important to consider, because the evidence suggests that it may be directly related to recognizing the significance of stimuli (particularly rewarding stimuli) to produce appropriate responses (p. 6). The orbitalfrontal gyrus (OFG), which is the area of the brain responsible for

decision making and emotional regulation, dysfunction (reduced volume of gray matter) could perhaps lead to trauma-related, but currently non-relevant, stimuli (e.g., reduced contextualization) or to reduced reward processing – both of which have been implicated in trauma and PTSD (Aupperle, et al., 2013, p. 6).

While deployed in a combat zone, it has been found that social support seemed to have a protective effect on OFG volume in the case of lower levels of combat experiences. The greater quality of social interactions with comrades during deployment along with family members and friends result in greater preservation of OFG volume post-combat. However, the higher quality of social support can be detrimental in the case of high combat experiences. In the situation of high unit cohesion where many of whom were injured or killed, the higher quality of unit relationships can have a negative impact (Aupperle, et al., 2013).

Sleep hygiene

Sleep disturbance and deprivation coexist with PTSD and mTBI. This is often attributed to nightmares and/or headaches. Sleep deprivation has been found to adversely affect cognitive functioning; pain thresholds; and to trigger headaches. It impairs attention; working memory; long-term memory; and decision making. In light of this, it would not be surprising that improvement in sleep hygiene would increase cognitive performance (Ruff, et al., 2012). In the study performed by Ruff, et al., (2012), they found that those who had experienced headaches; residual neurological deficits, were most commonly found in the form of impaired olfaction (the sense of smell). According to Ruff, et al., (2012); past studies had suggested that PTSD strongly influenced symptoms associated with mTBI in deployed personnel. Their study suggested that altered sleep due to PTSD contributes to symptoms that emerge following combat mTBI. Headache pain; frequency of headaches; and cognition were all associated with sleep hygiene;

PTSD symptoms; or both. In addition: “the role of mild cerebral injury associated with mTBI in the symptoms that emerge following combat mTBI may be primarily to increase the likelihood that a psychologically traumatic event results in PTSD” (Ruff, et al., 2012, p. 1315).

Improved sleep hygiene through counseling and medication reduced the severity of headaches, PTSD symptoms, and daytime sleepiness. There were no changes in the presence of neurological deficits.

Diagnosis of combat related PTSD and blast induced TBI

There is a gap in identifying symptoms that differentiate TBI, PTSD, and depression. A common problem that faces a person who has co-morbid TBI and PTSD is that many of the symptoms overlap making it difficult or even impossible to delineate the true source of the symptom. There is a clinical challenge with triage and the appropriate referral to specialty care. This is important in the fact that services received by a veteran should be specialized and focused to allow the service member the greatest potential for recovery. “Veterans with positive TBI screens were approximately twice as likely to also screen positive for depression and PTSD” (Maguen, Lau, Madden, & Seal, 2012, p. 1115). This research found four distinct constructs emerging with veterans which are: TBI, PTSD, depression, and a fourth construct consisting of hypervigilance and sleep disturbances. The idea of cumulative disadvantage is used when hypothesizing how comorbid mental health issues might interact with TBI and that “TBI and PTSD may be mutually exacerbating and precipitate detrimental behaviors (e.g., substance abuse), health problems, and negative psychiatric outcomes. Depressive symptoms are likely to further exacerbate deficits and impair functions” (Walter, Barnes, & Chard, 2012, p. 426). Writer (2010) addresses the overlap in symptoms with post-TBI sequelae and persistent

postconcussive symptoms that are nonspecific. It has also been stated that:

Although PTSD and other TBI related sequelae presumably result in clinically significant functional impairments in OIF/OEF veterans, the diversity of trauma challenges our understanding of the interaction between who may have impairments that go undetected by routine clinical examinations. However, executive dysfunction may be a common pathway to functional impairment regardless of wound severity or psychological comorbidity (Writer, Shillerstrom, Regwan, & Harlan, 2010, p. 842).

Stigma

Self-Stigma is significant in the veteran community. It is often associated with being characterized as weak willed; the belief that the veteran should be able to exert control over their symptoms; or even as being unstable, dangerous, and/or violent. Corrigan (2004) described label avoidance as, “perhaps the most significant way in which stigma impedes care seeking” (p. 616). “Although it remains unclear whether this is true of military populations, research suggests that label avoidance plays an important role in attenuating service utilization by military members” (Dickstein, Vogt, Handa, & Litz, 2010, p. 226).

Effects of Mindfulness Practice

Mindfulness practice has recently been performed with increased frequency to reduce stress and other harmful symptoms associated with anxiety and depression disorders. It has been proving to be an effective means to alleviate many of these symptoms and increase general quality of life. King et al. (2013), addresses the use of two different mindfulness techniques in a classroom setting: Stress-reduction groups involving mindfulness meditation techniques delivered as classes in health care settings (e.g. mindfulness-based stress reduction or MBSR) have shown promise for reducing emotional distress and symptom severity across a number of

psychiatric conditions with anxious depressive symptomatology. Kearney, McDermott, Malte, Martinez, & Simpson (2012), report that teaching mindfulness has also been used for managing conditions that include: chronic pain; psoriasis; anxiety; fibromyalgia; cancer care; and depression. Kearney, et al. (2012) continue to explain that teaching mindfulness has been known to foster a more participatory role for patients with chronic conditions by teaching them to engage internal resources in order to maintain or regain health. There is evidence that participation in an 8-week mindfulness course results in potentially creating beneficial changes in neurophysiology and an increase in gray matter density.

Mindfulness is an acceptance-orientated intervention that has been proposed as a viable alternative or as a compliment to the standard trauma-focused intervention for PTSD. Kearney, McDermott, Malte, Martinez, & Simpson (2012) define mindfulness as; “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (p. 102). King et al. (2013) state that mindfulness-based interventions strive to entrain sustained mindful attention and acknowledgment of even unpleasant emotions or memories in a nonjudgmental manner. King et al. (2013) continues on to state that “such techniques stand diametrically opposed to the psychological processes of avoidance and suppression of painful emotions and memories, which are thought to contribute to symptom maintenance in PTSD” (p. 639).

Mindfulness and the veteran community

With the significance of veterans who have return home with PTSD, TBI, and depression; there has been a large amount of studies focusing on evidence-based practices and treatments for these disorders. The Veterans Administration specifically focuses on how to best provide the care that the veteran population would benefit from and the delivery of such services. The Veterans Affairs (VA) National Center for PTSD recommends evidence-based

pharmacologic and behavioral interventions for PTSD (U.S. Department of Veterans Affairs / Department of Defense, 2010). Selective serotonin reuptake inhibitors (SSRIs) produce improvement in the major symptom clusters of PTSD, although the magnitude of the treatment effect is modest (Schoinfeld, Marmar, & Neylan, 2004). Regarding the evidence-based behavioral interventions Kearney, et al. (2012) discuss psychotherapeutic approaches that include cognitive processing therapy (CPT), prolonged exposure (PE) therapy, stress management skills training, and eye movement desensitization reprocessing (EMDR). The combined efforts of pharmacological and psychotherapeutic treatments had been met with great success “to reduce the hallmark features of chronic PTSD, but often fail to address the entire realm of psychopathology” (Lombardo, 2005). The utility of PE therapy is also limited by a high dropout rate of 38% (Schnurr et al., 2007).

Mindfulness and PTSD

Many studies have been conducted reflecting the efficacy on reducing the symptoms associated with PTSD i.e. “recurrent, intrusive recollections or re-experiencing of a traumatic event, persistent avoidance of internal and external cues that trigger re-experiencing, emotional numbing, and hyperarousal” (Kearney, et al., 2012, p. 101). The inability to control the thoughts and emotions that are associated with those reinforces the hold that symptoms of PTSD have. “Mindfulness practice could also be hypothesized to reduce the level of distress caused by intrusive thoughts and the tendency to avoid or suppress these thoughts. Thought suppression paradoxically increases reexperiencing for persons with PTSD” (Shipherd & Beck, 2005).

Mindfulness and exposure therapy

Various studies have found that mindfulness training has similarities in process and effect of exposure therapy. “Exposure-based therapies have been highly effective in the treatment of

PTSD, and do not show higher rates of adverse events or premature dropout than other forms of PTSD therapy” (King et al., 2013, p. 639). Exposure therapy is based on the re-experiencing of a traumatic event while in a peaceful state of mind and in a safe environment in hope of reconditioning the negative memory with a non-traumatic experience. Kearney, McDermott, Malte, Martinez, & Simpson (2012) reflect on mindfulness practice relating to exposure therapy in their statement:

Consistent with this idea, our findings of an increase in behavioral activation and functional status along with a decrease in experiential avoidance support the hypothesis that an increase in mindfulness leads to decreased avoidance behaviors. This is postulated to occur because of mindfulness practice, which encourages participants to bring forth an attitude of curiosity and openness to experience, including difficult experience. Although these ideas remain to be tested specifically, it is possible that an enhanced ability to bring sustained nonjudgmental attention to difficult emotional states decreases emotional numbing and hypervigilance (p. 112).

The benefit of using mindfulness practice while respecting its similar characteristics with exposure therapy is that it does not try to change the experience of trauma, but rather changes how the experience is perceived.

Accordingly, mindfulness practice in patients with anxiety disorders was conceptualized as providing a form of exposure to experience of feared thoughts and bodily states. Interestingly, in contrast to “refuting” or changing the content of negative cognitions that is typical of traditional cognitive behavioral therapies, MBCT appears to alter one’s relationship to negative emotions (King et al., 2013, p. 639).

The idea of disengaging from negative emotions that are connected to a traumatic experience has been found as an effective means of allowing the emotions to run their course and move closer to a relationship of indifference with the emotions.

Mindfulness and rumination

Rumination is a significant symptom of PTSD. Measures of rumination correlate with increased vengefulness, or the disposition to seek revenge after suffering an interpersonal offense (Barber et al., 2005; McCullough et al., 1998, 2001). Borders, Earleywine, & Jajodia (2010) explain that there is evidence suggesting that “rumination exacerbates and leads to anger, hostility, and aggression” (p. 28) and “that rumination exacerbates angry mood, increases hostility, interact with perceived provocation to elicit more aggressive behaviors, and may increase physiological arousal” (p. 29). Rumination is a medium for some of the strongest, negative, and harmful symptoms associated with PTSD.

The process by which rumination causes aggression is still being explored, however it is proposed that mood-congruent information is associated with long term memory neural networks and this network is linked to related memories, thoughts, feelings, and behavioral tendencies. Activation of one part of an associative network can activate other items stored in that network. Miller et al. (2003) suggest that repetitive thoughts and elaborations about a provocation may maintain the activation of anger-related associative networks over time. This creates a stronger connection to feelings of anger. Hostile thoughts become more accessible and aggressive behavior more likely to take place.

Rumination has been conceptualized as a process characterized by internal, sustained, and rigid attention to perceived discrepancies between current and desired states. This rigid and repetitive self-focus elicits negative affect, particularly when a negative discrepancy exists and

when one fails to resolve such a discrepancy (Carver and Scheier, 1981). This rigid state of mind is in contrast to mental flexibility; a characteristic associated with mindfulness. By practicing mindfulness, a person learns how to disengage from rigid mental cycles. They may notice negative affect, but will inevitably notice other sensations or events in subsequent moments. They are not locked into analyzing the negative feelings, because being present in the moment, there is so much more to observe (Borders, Earleywine, & Jajodia, 2010).

When considering the positive effects that mindfulness practice has on symptoms of PTSD, it is reasonable to examine the direct effect that mindfulness has on rumination. Past studies have shown training in mindfulness to be associated with reduced rumination. Rumination may be an additional mechanism through which mindfulness interventions could influence PTSD symptoms, given evidence that rumination mediates the relationship between beliefs regarding the trauma memory and PTSD symptoms (Bennett & Wells, 2010).

In a study by Borders, Earleywine, & Jajodia (2010), persons with PTSD who had experienced rumination reported items like “I could be experiencing some emotion and not be conscious of it until some time later” and “I tend not to notice the feeling of physical tension or discomfort until they really grab my attention” had the lowest factor loadings. Items like “It seems I am running on automatic, without much awareness of what I’m doing” and “I find myself doing things without paying attention” had the highest factor loadings (p. 35). Their study involving these test subjects who experimented with mindfulness resulted in: “it appears that more mindful people may be less angry and hostile in part because they ruminate less. This finding constitutes the first evidence that rumination may be one potential mechanism by which mindfulness is associated with anger and hostility” (Borders, Earleywine, & Jajodia, 2010, p. 37).

Mindfulness and the fear response

While in distress, the ability to address a link to the fear response areas in the brain with a sense of indifference or neutrality suggest that mindfulness practices effect on rumination will be positive, potentially leading to an ability to live without automatically reacting with a “fight or flight” response. There is support that the role of mindfulness training in the treatment of PTSD comes from evidence that the brain regions enhanced by mindfulness practice include areas that play a role in extinction of conditioned fear responses, which may directly affect symptoms of PTSD (Kearney, et al., 2013).

Spiritual and/or religion based mindfulness

Mindfulness practice is secular in nature, but it is worth noting any differences that have been found when adding a spiritual or religious element to the practice. Spirituality is defined as: “a multi-dimensional construct with various meanings. It has been defined as having meaning, purpose in life, transcendence or connectedness to a higher being, force, or energy” Whereas religion is: “differentiated from spirituality, has been defined as a set of fixed beliefs and practices that are held by a specific group or tradition” (Bormann, Liu, Thorp, & Lang, 2011, p. 497).

The experience of trauma has been described as “challenging to one’s religious and spiritual beliefs related to meaning and purpose in life” (Bormann, Liu, Thorp, & Lang, 2011, p. 497). Bormann, Liu, Thorp, & Lang (2011) also state that in the veteran community, many of those “who had experienced killing or who failed to prevent others from death reported that their religious beliefs had weakened and their feelings of guilt had increased” (p. 497). In response to such an event; “Attending to a person’s spiritual beliefs may be a valuable tool when assisting a

person who has experienced trauma to find means to cope with the aftermath” (Bormann, Liu, Thorp, & Lang, 2011, p. 497).

Bormann, Liu, Thorp, & Lang (2011) performed a study focusing on the efficacy of managing PTSD symptoms with veterans who had experienced a traumatic event by training their attention through the use of a mantram.

“Mantram” versus “mantra” denotes a specific set of guidelines. Mantram repetition [i.e., silently focusing attention on a selected sacred phrase (e.g., Ave Maria, Om Mani Padme Hum, O Wakan Tanka, Rama, etc.)] is practiced daily throughout the day. Slowing down thoughts and developing one-pointed attention, hallmarks of mindfulness practice, are other allied skills taught to support mantram repetition (Bormann, Liu, Thorp, & Lang, 2011, p. 497).

Training in the use of a mantram as a coping tool consisted of the mantram being used on a frequent basis during peaceful, non-stressful times. The repetition of the mantram in this way would elicit a rapid relaxation response, which could be used when encountering a stressful event. The results of their study showed that the use of a spiritual phrase is recommended over a secular phrase. When comparing the two groups Bormann, Liu, Thorp, & Lang (2011) reported the secular group receiving greater health benefits such as reductions in physical pain and psychological distress “Thus, the connection to one’s spirituality may be an important contributor to the effect of the practice” (p. 497).

Conceptual Framework

America has taken great strides to become more informed and sensitive about trauma and the issues surrounding it. In recent years there has been an extensive amount of research on the effects of trauma within society focusing on its effects on a person’s ability to function within

their environment and on their quality of life. The conceptual framework being used for this study will be trauma informed care. The foundation of this study focuses on care in the presence of two types of trauma; PTSD and TBI. Understanding how trauma and its various treatments affect a person, it is paramount to understand how the brain is involved. Trauma, in any form, affects the make-up of the brain. By receiving therapy or treatment to improve the symptoms of a trauma, the focus is to gain and/or improve coping skills in dealing with triggers associated with the trauma. Trauma affects all aspects of a person's life including: relationships with friends and family, work, education, etc.

Veterans are the target population of this study. PTSD and TBI are significant within the veteran population. In 2009, a national sample was taken of all OEF/OIF veterans who received care at the VA. Of those, 6.7% had been diagnosed with a TBI. Of those who had received a TBI, 89% also had a type of mental disorder; 73% of the time this disorder was PTSD (Cifu et al., 2013).

Veterans of the post September 11, 2001 (9/11) era have returned home to face challenges with reintegrating back into the civilian sector. Many (if not all) of those who have experienced combat are exposed to trauma at some level. According to Bruke, Olney, & Degeneffe (2009), 22% of all combat injuries involve some sort of brain damage. "The need to develop and facilitate specialized care and rehabilitative services for veterans impacted by this modern disability is of paramount importance" (p. 5). A vast amount of research has been completed surrounding PTSD and various types of treatments for it. There is a great amount of evidence based therapies for PTSD. There has also been a significant amount of research done

on TBI and the various treatments for improvement.

A substantial number of injuries in our returning troops involve the head and are caused by a neurologically damaging explosive blast. The traumatic nature of injuries in the combat environment is leading to increased presence of PTSD. Future research should focus on key issues in this area, including evaluating the effect of mild TBI on the symptomatic features and PTSD development and exploring optimal identification of and treatments for PTSD after mild TBI (Jaffee, Leskin, Stokes, Leal, & Fitzpatrick, 2007 p. 913).

There has not been a significant amount of research on the effects of treatment/therapy for comorbid PTSD & TBI. Due to the significance of veterans who have been diagnosed with a TBI or have been in the proximity of a blast and have experienced symptoms that correlate with PTSD and/or TBI, it is the purpose of this research to understand more about reasonable treatment for this condition.

The use of mindfulness practice has gained momentum in the US for treatment of PTSD and anxiety disorders. Exposure therapy is a proven evidence based therapy for PTSD. Mindfulness practice is similar to exposure therapy in the sense that it focuses on being environmentally safe; on being present in the moment; and aware of all experiences (emotional and physical feelings, and thoughts). There has been little research on the effect of mindfulness practice on veterans with comorbid PTSD and TBI.

This qualitative study will use an interview process to gain a greater understanding of how mindfulness practice effects those afflicted with comorbid PTSD and TBI. Because trauma has a direct effect on the brain, the findings of certified, experienced professionals who are educated in the neuro sciences and work in the areas of diagnosing and treating trauma will be

highly valued in this study. If a person has the above qualifications and is also working with veterans, their professional opinion would lay a strong groundwork for understanding the potential of the successful use of mindfulness practice on a veteran with comorbid PTSD and TBI; though direct work with veterans is not necessary for this evidence.

The professional opinions of mental health therapists using mindfulness based practices with persons who have sustained a TBI and/or have been diagnosed with PTSD will also be important to attain. With the significant amount of veterans who have experienced both PTSD and TBI, there has inevitably been a high amount of work done with this population. It is the purpose of this study to collect evidence from a large number of experienced professionals to gain a better understanding on the effect of mindfulness with those who live with comorbid PTSD and TBI; as well as explain if/how the presence of TBI changes the result of a mindfulness based intervention.

Methods

Sampling

The method used to find the individuals who were considered human research subjects in this study was purposive sampling (Padgett, 2008). This was based on the individual's ability to give direct answers regarding their knowledge from either being a direct care provider and/or a researcher in the area of TBI, PTSD, and mindfulness practice. Persons considered were either specialists in their area of expertise and/or had specialized experience in these areas regarding to the veteran population.

Professionals who had been associated with the Minnesota Brain Injury Alliance (MNBIA) were approached to participate as human research subjects. A snowball method was

be used. A brief introduction of the researcher and the focus of research was placed on their Facebook webpage.

A planning committee for a military focused mental health conference was approached during one of their meetings and presented with the opportunity to individually participate in the study. The committee consisted of professionals who have worked directly with the veteran community in a variety of focuses.

Clinical professionals who had been associated with the Veterans Administration Medical Center were also considered as human research subjects. These subjects did not need to be directly employed by the VA, but had specialized work with veterans who had PTSD, TBI, or both. The focus was on veterans, but data from specialized professionals who had not specifically worked with the veteran population were still considered to be of value within this study.

Four professionals whose experience fell within the guidelines given above were interviewed. Those who were interviewed had the following specializations: a nurse and professional educator specializing in brain injury; a psychologist and physical therapist with a focus in brain injury; a clinical social worker with a focus in homelessness veteran case management; and a clinical social worker with a focus in case management for OEF/OIF veterans.

Identification or any distinguishing features of clients/patients of the participants was not acquired or recorded. The study was completely focused on the professional experience regarding the work with the given population and did not have any direct reflection on the clients/patients.

The human research subjects read and signed a letter of consent and confidentiality. Their rights to privacy was acknowledged. Their names will remain anonymous. They were selected solely due to their experience and expertise on the subject matter. They were not coerced in any way to answer questions that they do not want to. Subjects had it explained to them that they were able to end the interview at any time they wanted.

The interviews were recorded using an app on the cell phone of the researcher. The cell phone was password protected with a code that only he knew. The interview was transcribed on the personal computer within the home of the researcher, which was protected with a password that only he was aware of. All physical copies of the transcribed interview were kept in a locked file that only the researcher had the key to and kept there whenever they were not being used by the researcher. A date was provided on the consent form letting the subjects know when the interview will be deleted from the researcher's phone and when all copies of the transcribed interview will be shredded.

Measures

The measurements were mainly qualitative in nature using descriptions of the specialized experiences of the professionals interviewed. The questions asked were changed slightly depending on the area of specialization of the human research subject. The first question was qualifying in nature seeking information about scope of practice, length of time in practice, the demographic of clients/patients they worked with. An inquiry into the work they have done with veterans was made along with their thoughts about working with the veteran community, and if it's different than working with the civilian community. Depending on the area of specialization they were asked about their knowledge in the remaining areas of the study in which they do not specialize (mindfulness practice, TBI, PTSD, co-morbid TBI and PTSD) and how these areas of

focus applied to the work they had done. The affect that trauma has on the quality of life followed by what kind of treatments they have found to be most successful was asked. Questions relating to the effects on brain function/structure regarding their area of specialization were asked regardless of professional focus. This same question was asked about the areas of this study outside of their specialization. The interviews ended by focusing on mindfulness practice; how it can affect a person's brain function/structure who has co-morbid TBI and PTSD, and how this could affect their client/patients quality of life.

Analysis

Analysis of this study used a grounded theory approach. It began with the complete and exact transcription of the recorded interview performed by the researcher. Each interview was listened to and transcribed an initial time, and then transcribed a second time to ensure the precision of the transcription. Once the interview was transcribed the researcher carefully read it to search for meaning and in an attempt to recognize patterns and themes. The content of the interview was coded by the researcher and highlighted uses different colors representing recurring topics. The topics that came out of the coding were: common ailments and barriers veterans with TBI and/or PTSD experience; methods of effectively impacting veterans with TBI/PTSD; professional qualities of effective therapists; different therapeutic methods; symptoms specific to PTSD; symptoms specific to TBI; symptoms specific to comorbid PTSD and TBI; the meaning of quality of life; and qualities/styles of mindfulness practice. It was then organized into three themes. From these recurring ideas the three themes surmised were: the invisible wound; qualities of effective therapists and challenges they experience; and mindfulness practice. The transcripts were then searched for quotes that would serve as evidence to support the themes.

Findings

This study found three primary themes. The first theme is the invisible wound. The invisible wound refers to the findings surrounding the challenges to improving quality of life that are encompassed in the symptomology and the lack of tangible evidence to be used to identify the origin of the symptoms. The second theme focused on the characteristics of therapists working with veterans. These characteristics included personal style and values, as well as peculiarities that obstruct positive outcomes. The last theme is mindfulness practice as a therapeutic approach. Examples of different forms of mindfulness are presented, as well as the physiological and neurological affects.

Theme 1: The invisible wound

It is understood that the result of trauma, be it via what is being classified as mild TBI or PTSD, creates a physiological change within the brain that cannot be determined physically. The barriers that were observed to be congruent with the invisible injury appear to be emotional and social in nature. The process of identifying this type of injury is primarily focused on reactions to stimuli, changes to behavior, and/or executive functioning. There are common ailments recognized that coincide with this injury as well as symptoms focal to isolated TBI and isolated PTSD, which are listed below.

Primary source of barriers associated with the TBI and PTSD

There were a number of common symptoms reported. When these symptoms are experienced they present as challenges to improving the quality of life (QoL) of those living with TBI and PTSD. These symptoms present the internal, subjective changes in the person's emotions, behaviors, and executive function.

The reported symptoms/challenges were:

- Problems paying attention
- Issues with focus and concentration
- Memory
- Executive function
- Depression
- Anxiety
- Irritability
- Challenged emotional regulation
- Ridged thinking / inability to see alternative ideas
- Chemical use
- Feelings of responsibility / self-blame
- Lack of willingness to be vulnerable
- Socialized Masculinity

Of the symptomatic barriers presented, it is important to note that they vary from person to person and no one is recognized more than another.

When a TBI happens, it often has the neurological/cognitive effect of making it more difficult to access different paths of thought that the person once was able to access with ease prior to the injury. To explain this phenomenon; one study participant explained the neural concept of ‘what fires together wires together’ and used the analogy of Hansel and Gretel. Hansel and Gretel are walking through the woods laying down a trail of breadcrumbs so they can find their way back. This represents a person’s normal ability to function and process memories. A TBI can act as a bird following Hansel and Gretel eating the breadcrumbs, making it challenging for the pair to find their way back or to use the pathways they once had available to them. If a diagnosis of PTSD is introduced to the scenario, this can look like the breadcrumb trails changing into bread loaf trails, and eventually becoming bread truck trails. This metaphor is to represent a person’s change to rigid thinking expressed by an inability to access other pathways, or the inability to choose how they react to events in a way that is conducive to their desired lifestyle.

All who were interviewed discussed the relevance of the practitioner being strong in the areas of patience, empathy, and understanding. People who have been afflicted with a brain injury or PTSD can be challenging for a person who does not have an understanding of the symptomology associated with this type of injury. The emphasis to get positive results within a certain timeline reinforce the difficulties that many therapists face when working with this population. This seems to be especially true of veterans of Iraq and Afghanistan. One respondent stated:

My understanding is that a lot of people coming back from Iraq have had more concussive head injuries, so it's more generalized; kind of a 'scramble', instead of a focal hit. We know enough about the plasticity of the brain that it might, especially with a concussive or an anoxic brain injury, take longer. I think that the scrambling that comes with the brain injury makes it (therapy) not as efficient. I think it can still be effective with consistent treatment with a therapist willing to preserve and be repetitive.

One of the respondents stated that when a person has PTSD, as they go into the public they are constantly expecting a trigger and find themselves in a pervasive state of always looking for it. He referred to this type of trigger as a "touchstone" and a "rock" that they are constantly looking outside of themselves in order to reinforce the trigger. Another participant reflected on PTSD as the reaction to a traumatic event that the person has not recovered from yet. PTSD will not kill you. It may create feelings that you're going to die, but it will not kill you.

Quality of life

The topic of quality of life (QoL) is subjective in nature. When discussing the complications with having an injury that cannot be seen, it is important to consider how a person defines QoL, and how they feel this has been challenged. The common characters associated with QoL according to those interviewed are: feeling as if one has a purpose; being able to do the things that you enjoy; feeling a part of; being needed; feeling stable; and being capable of affecting change in one's life.

This study found that QoL is significantly reduced with the presence of PTSD and/or TBI. Many of the symptoms that present with these conditions impair a person's ability to live at a QoL that they were once accustomed to. One participant stated that often the QoL is higher for a person who has sustained a severe TBI verses and mild to moderate TBI, because they are not as aware of the lifestyle that they lived prior to the injury. The person with the mild or moderate injury often feels consistent frustration due to their inability to remember things and control their emotions the way they once had.

All participants in this study stated that mindfulness practice is an effective means for improving QoL for most people regardless if TBI or PTSD is present or not. Due to the baseline of QoL that populations who have a TBI or PTSD begin at in comparison to those who don't the; beneficial gain for those with a TBI or PTSD is significantly higher.

It should be noted that the severity levels of TBI and PTSD have a direct correlation to a person's ability to participate in mindfulness practices and in turn have an impact on QoL.

Social/cultural considerations

The most prevalent challenge when discussing the nature of living with an invisible wound was the cultural value of having physical evidence. Due to the wars in Iraq, Afghanistan, and the recent focus on sports concussions, American society has become more observant of brain injuries and the challenges that people who live with a brain injury struggle with. There is still a desire to only pay attention to what can be physically observed. One participant explained it this way:

We know the mechanism of injury when it comes to blast or any velocity changes where there are more of a diffused than a focal injury are not only harder to pin down, they're harder to get the view of the patient or societies head around. Because we in our CSI society we like to point at the things and so there is a very different socio, social reaction to those types of injuries and it's much different to work through than, 'you have a brain tumor right there, and I can point at it and I can do something about 'that''. I think it doesn't necessarily mean that the actual treatment is different, but the emotional realm that you need to address is probably a little more unique and little more sensitive and little bit more time needs to be spent on addressing the disability. It's confusing and it's not natural to orientate that way, so I think that the treatment of these patients would be more of an approach than a treatment modality. Addressing the emotional frustration and confusion around the injury that no one can point at.

The social impression that a person has when there is a disconnection with how they feel and think when they physically appear to be uninjured adds to the barriers for a person to make progress. Often times the person who has received this type of injury is not aware that they have

been injured until after some time has passed. A person may receive an injury and feel confused when they look in the mirror and see nothing wrong.

We're so geared in our culture to treating the wound, and can I see the wound. That does have a big effect. I look normal, why can't I be normal; whatever normal is. I also think, again for those who aren't as learned in the area, especially in the area of mild brain injury, I used to do a lot of research in the areas of mild TBI, and looking at those kids, those young men, when they had a concussive injury, they didn't lose consciousness long, went to the ER. The ER does the CATSCAN. The CATSCAN looks fine. ER sends them home. The first day they go back to work or school and all of a sudden the entire world irritates them and that's the brain injury.

When a person is told that they have been tested and the tests have concluded that there is nothing wrong, but they do not have the ability to filter the environmental stimuli they experience, they will often live in silent suffering. The reaction of not seeking help is identified as a value of those who serve in roles that can be seen as helpers, such as military members or police officers. While discussing the willingness to be vulnerable as a big hurdle, one participant stated:

It's all kind of that socialized; ingrained; masculinity where I need to be in control. I need to be taking care of things. I'm not the one who's supposed to be asking for help; I'm supposed to be helping others.

The pride that is associated with being a member of a service-oriented profession can be a source of strength in the face of adversity, but it is this same sense of pride that often creates a hesitation and prevention to seek assistance for issues of mental health.

Theme 2 – Qualities of effective therapists and challenges they experience

When interventions and modalities of service delivery to those whose injuries can change and challenge how a person identifies with themselves, there are a variety of strengths and focuses that have been found to be effective in creating positive change. This study found that when addressing the qualities of an effective therapist it is valuable to also consider the challenges they are faced with in order to create context for what makes them effective. This theme will be broken down with into two subheadings to represent this.

Challenges working with invisible injuries and the veteran community

A challenge that many civilian mental health practitioners' experience when working with the veteran population is their inability to understand the experiences and the culture of the military member.

I'm not sure I even have the imagination to comprehend battle. I can read about it and look at it for what it is, but in my brain I can't even comprehend being there in it, so that's the recognition piece of diversity and how big of a gap does that create between me and the person I'm working with... When a vet comes in and starts talking, sometimes I feel like I need a translator, because of all of the initials, it's almost like a foreign language at times. And it is... a diverse life they've lead that I think a lot of civilians don't quite get.

When acknowledging this as a practice challenge that a civilian provider may face, it has been effective to not avoid this; treating it as a professional deficiency, but rather seeing it as an

opportunity to learn more about the person and the culture they are from.

I think the other piece is, especially for someone like me, someone who has not been in the military, I've done it peripherally with some things, but for me to allow my client to educate me and for me not to go in with the stance of; this is just like every other trauma, or like I understand.

It is important to avoid assuming to know what a person has experienced. This show of humility can act as a role modeling behavior of shared vulnerability. This also allows the client to see that the therapist is not going to use any personal information or experience that is not offered by the client.

Personal qualities of effective therapists and efficacious methods

Using an inclusive personalized approach instead of a standardized model was recurring in the discussions about effective interventions. The ability to adopt to the needs of the individual in the time frame that you are working with them will create a greater likelihood of achieving a better result.

The emotional needs can be very different at times and even if the diagnosis of PTSD may be official or not. Paying special attention to the emotions around the trauma around that event, will be very beneficial to the overall outcome.

Two repeated qualities were repeated while discussing the achievement of reaching client goals: patience and repetitiveness. When discussing the presence of a traumatic brain injury

affecting the effectiveness of treatment an interviewee stated:

The brain injury makes it not as efficient, I think it can still be effective with consistent treatment. It's more around; do we have the therapist who is willing to preserve and be repetitive? I think without the brain injury if the therapist is not used to brain injury they might get frustrated with thinking that this isn't working, when it would work with more consistency, and more perseverance, and more breaking it down into smaller working pieces.

Handholding was discussed by all study participants as a fundamental requirement to achieve a positive outcome for veterans with these ailments. Different methods of handholding discussed were: assisting with reminder calls for appointments; reminder letters sent in the mail; assistance navigating the systematic features of the facility they are in if that be a VA facility or a different medical facility; and understanding or lenience if scheduled meetings or obligations are not met.

One of the people interviewed felt that in order to be an effective mental health provider, one needs to continue their training and educational focus in their area of interest.

We're not holding hands long enough, we're not cross training, we're not cross treating, we're not cross educating. It is that rare person who, because of the mental health professional is going to work in this field and do it effectively is someone who has probably gone out and gotten their own training versus somebody or some school that said 'this is required training'.

Once a person is actively working within the mental health field, they will find it beneficial to continue their education with a specific focus that will directly serve the population they are working with.

Theme 3 – Clinical methods for treating PTSD and/or TBI including mindfulness

Many methods to assist clients with PTSD and/or TBI were reported by those who were interviewed. The methods stated below have all been noted to be effective in producing positive outcomes for many of the clients the study participants had worked with. Listed below are the methods that have been reported and the ways that those interviewed have found them to be effective followed by findings surrounding mindfulness practice and how it has been utilized.

Methods not specific to mindfulness

Many practice methods have been found effective when assisting those who have sustained a brain injury or have had a diagnosis of PTSD. The three most common methods used outside of mindfulness practice that were reported were eye movement desensitization and reprocessing (EMDR); cognitive processing therapy (CPT); and Prolonged Exposure Therapy (PET).

EMDR was reported to be more effective working with TBI when coupled with trauma narratives. The practitioner must be willing to get into the narrative, while considering the fact that often the executive function of the person being worked with has been compensated. In this type of scenario, the use of insight based work is to be implemented either at a slower pace or should place more focus on attempting to guide them to the details instead of relying on them to offer the details.

CPT is an evidence based practice that has been found to be an effective practice implemented to assist with PTSD. When discussing CPT and comparing it to cognitive behavioral therapy (CBT), one interviewee stated: “I think of that one more as the big C, little B of the cognitive behavioral. It’s focused on the thoughts of people who have PTSD. A lot of them develop beliefs about the event, what happened, and a lot of them have self-blame.” An example of this process can assist with identifying false belief systems was explained as: a sergeant in charge of a patrol lost one of his men in an explosion. This sergeant blamed himself for the death of his team member having thoughts like, ‘if I would’ve left at a different time, he’d still be alive; or if I had assigned him to a different truck, he wouldn’t have been killed’. Using CPT exposes the false belief that somehow the sergeant was controlling the situation. The professionals’ response to this type of thinking was:

If you knew it was going to happen, you would’ve done something about it ahead of time. You didn’t know it was going to happen, so you couldn’t have done anything about it ahead of time.’ It’s like redirecting that belief and those thoughts, so once they can get a better, clearer picture of the event and how it actually happened, it’ll help them realize that they’re not responsible for it. And that really helps with resolving a lot of their symptoms.

CPT is an effective means of neutralizing deeply held beliefs responsible for shame and feelings of responsibility. It is focused on replacing thoughts that are not based in the reality of the situation with a rational impression of a person’s position within the traumatic event.

PET focuses on changing the thought/feeling patterns or neural pathways involved with a traumatic event. It is recognizing that when a person is triggered to remember a traumatic event,

it creates an immediate emotional response as if the event is taking place in the present. PET attempts to expose the person to the trigger, but change how they react in hope that it will create new positive and healthy thought/feeling reactions to the trigger.

If the exposure therapy is done appropriately, it can lead to unique pathways, because the pathway of exposure to the emotional reaction like fear or anger. Having the emotional reaction to that exposure, you can explore creating a divergent kind of pathway from that same exposure to different emotions. You're weakening the current pathway away from the event. The experience of the exposure to the painful or hurtful or unhealthy reactions to strengthening pathways from the exposure of that event to more neutral reactions.

It was reported that PET has been connected to mindfulness based practices. They both have been proven to 'rewire' neural pathways, which has been objectively noted through brain imaging and through recorded changes in emotion, behavior, and thought processes.

Mindfulness Practice

According to the participants, mindfulness based practices are an effective way of improving a person's quality of life regardless of whether they have sustained a traumatic injury or not. Mindfulness based practices have shown to improve emotional regulation, which is directly affected by the presence of TBI and/or PTSD. One person stated knowing people who have participated in extensive mindfulness trainings and every single one of them stated that it has absolutely changed their lives.

They can tell when they're irritable, they know when they're irritable, they just might not be able to have as much control over it. But, it's the behavioral processing that does that, so you relearn that. So you relearn to regulate those emotions and work on being present

using the mindfulness, being present and being aware of when that's happening. Is it a perfect process every time? Absolutely not, but it can be done.

According to this person, everyone can work on being more present; aware of their thoughts, emotions, and not getting wrapped up in them all of the time.

Mindfulness assists with feeling centered and internally grounded. A person practicing mindfulness is not constantly looking outside of themselves for reinforcement of their potentially distorted beliefs and triggers.

I think that they can build that internal security, that internal awareness, that internal stability of knowing that I'm ok 'here'. I don't have to get panicked; I don't have to have something out there immediately to hold onto. I have the resources within me. They can get those resources from within and then they can be more comfortable with 'me' and become more comfortable understanding these thing inside of me and understanding that the triggering of the PTSD feels like it going to kill me, but in reality, if I can get in there and get the mindfulness I can realize that it's not horrible, it's not comfortable, but I can survive it. I can get through it and there is another side to it.

Mindfulness is universal in nature and can improve a person's mindset regardless if their injury is isolated or has other contributing factors. An analogy one participant used to explain how the effects of TBI and PTSD are impacted by the presence of both instead of being isolated is 'the toolbox mentality':

When working with comorbid PTSD and TBI they might have a very unique toolbox, not that isolated does not have a unique toolbox, but you may be asking someone to access coping strategies or rational control over their reaction to things when that tool might be

missing. Especially when you're talking about TBI, that toolbox may look very different and the specific tools that would be beneficial to that person in working through something like PTSD might not be assessable.

The use of mindfulness training is beneficial in assisting a person to become aware of the tools that they have at their disposal and perhaps discover tools that they were not aware of in the first place.

Mindfulness is a great way that no matter what tools are in the tool box. It's a natural process of the brain, no matter the state of the brain, to strengthen pathways. It can be one road into working with PTSD if other tools in traditional therapeutic situations may not be assessable because of the TBI. I think mindfulness would be equally beneficial to people with isolated PTSD or TBI, but it might not be the only option. If it's isolated you may have a few other tricks in that tool box to access. I think mindfulness is a very universal thing that is probably very beneficial for those who have comorbid situations that we know whatever state that brain is in will benefit from that.

Discussion

A main objective for mental health providers working with the veteran community is to increase the veterans' quality of life. The presence of PTSD, TBI, or both creates a variety of challenges and barriers to a positive outcome. The findings revealed that with the common ailments that many post 9-11 veterans' experience, certain qualities of therapists along with a range of approaches have proven to be efficacious for meeting their desired result.

It was the intent of this study to examine different ways that the presence of TBI can affect the outcome of mindfulness practice on veterans with PTSD. As is recognized in the

literature, the findings show that mindfulness is regarded as an effective practice for reducing stress and anxiety; both of which are symptoms associated with PTSD. What was not a focus in the literature, but was apparent in the findings is the importance placed on the understanding and willingness to engage in the experience surrounding the event of the client.

Those who were interviewed discussed how behaviors and emotional reactions are associated with neurological pathways created in the brain. These pathways are created through experience or what some professionals identify as an event, stimulus, and reaction. These events are constantly taking place, creating small changes in a person's neurobiology. When a person is exposed to a traumatic event or scene, these changes take place much more dramatically, making it seem as if prior pathways that a person once had available to them are no longer an option.

All participants who were interviewed unanimously agreed that mindfulness practice is an effective means of improving the quality of life for veterans who have been diagnosed with PTSD and/or TBI. Mindfulness has a grounding quality to it. It allows the person to recognize their feelings in an impartial way. By doing this the person can be aware of their trigger, but intentionally respond to it in a way that is appropriate to the situation.

It is clear that when a person is exposed to a blast, the line between TBI and PTSD becomes blurry. For this reason, the holistic effectiveness of mindfulness focused practice provides reason as to why it is valuable. As a treatment modality or an addition to a therapy that is already being practiced, mindfulness practice should be acknowledged as an efficacious means of improving QoL through increasing emotional regulation and expand expanding the ability to rationally understand ones place within their environment.

Due to the lack of understanding about how the brain works and the complications that a brain injury introduces, there has been a cultural movement toward avoidance regarding brain injury. Most professionals do not want to waste their time in areas where they are convinced that they will not get results. The challenge of understanding human behavior and how the brain affects it is daunting. The presence of an undetectable injury increases the challenge and probability that the practitioner may not get their desired result. The frustration of appearing to be normal is often not isolated to the person with the injury. In a different capacity it is can also be present within the mental health worker.

One respondent who works with veterans on a regular basis focuses on working with the whole person in light what the person is diagnosed with. She seemed to have a 'treat the symptom, not the diagnosis' mindset. This seemed to be in part to the fact that when you're dealing with what she referred to as polytrauma (multiple injuries that may include: TBI; PTSD; physical injuries; chronic pain; sleep disturbance; etc.), there may be multiple undiagnosed issues, which are unknown to the therapist.

The findings in this study brought up the question: is the diagnosis of a brain injury important to the outcome of the person who presents with the potential brain injury? The diagnosis or a lack of a diagnosis where there is potential for a brain injury can in itself create a barrier for a person to receive appropriate services. A mild to moderate brain injury cannot be objectively identified. This does not mean that the potential for a brain injury should be ignored. In actuality, the opposite should take place. If there is potential for a brain injury, that person should be treated as if a brain injury is present. For the best results they should be met with patience, respect, a willingness to be repetitive, and there should not be a specific timeline to expect positive results.

Veterans who are injured in combat are entitled to receive medical and mental health services through the VA. They have the opportunity to receive services until they meet the outcome goals of their treatment. The conditions involving polytrauma are not specific to the military, but services with freedom from a ridged timetable or an unlimited amount of services can be. This has implications for the treatment of civilians with similar injuries and attention should be brought to possibility of extending the treatment of those who may be silently suffering from the symptoms associated with TBI. The lack of evidence needed to distinguish brain injury and the complications brain injury creates for service delivery make it understandable that we as a culture are straying away from acknowledging this condition.

The results of this study suggest future research in the area of how to best provide services for those who have been involved in an event where a brain injury may have taken place. Research on the prolonged effects mindfulness practice have on the neurological landscape of a person who has sustained a brain injury will be effective in discovering more about the implications that mindfulness has on improving the quality of life for those living with brain injury and/or PTSD. It would be beneficial to have those who have been diagnosed with comorbid TBI/PTSD and have implemented mindfulness practice as part of their recovery process to be the focus of future studies.

Limitations

A limitation of this study is that the findings do not directly come from those who are experiencing TBI and PTSD coupled with the implementation of mindfulness practice in an attempt to improve their QoL. Though the findings come from professionals who are specialized in their field, having a firsthand perspective could create greater insight into the needs of those with the conditions focused on in this study.

A greater amount of participants would have allowed for more extensive and focused findings. The limited amount of four professionals should be taken into consideration when examining the findings of this study.

The complex nature of this study presents a limitation in the specific nature of the study. There are four primary focuses: veterans; PTSD; mindfulness practice; and TBI. By combining the affect that each of these four topics have on each other forced the study to be performed from a wide angle perspective.

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