

THE IMPACT OF HEROES ON THE WATER KAYAK
FISHING PROGRAM ON POST-TRAUMATIC
GROWTH IN U.S. MILITARY VETERANS: A CASE
REPORT

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Abstract: The purpose of this study was to explore the impact of Heroes on the Water's kayak fishing program on post-traumatic growth (PTG) in U.S. military veterans. PTG is a theory that suggests positive psychological changes can occur after a traumatic experience. Growth can occur in the form of personal strengths, relating to others, new possibilities, appreciation for life, and spiritual changes. Current research has suggested that recreation can aid in facilitating PTG. Recreation has also been considered a complementary form of treatment for veterans, particularly the use of outdoor and nature-based recreational programs. Heroes on the Water is a nonprofit organization providing kayak fishing program to veterans and their families across the U.S. Three participants completed the Post-Traumatic Growth Inventory (PTGI) reflecting on their experiences pre and post-their participation in Heroes on the Water. Each participant reported a change in their PTGI scores, more specifically an increase in PTG after participating in Heroes on the Water kayak fishing programs. Though the results of this study cannot be generalized, they add to the knowledge about the use of recreational therapy to facilitate PTG in veterans and encourage continued research in this topic.

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CHAPTER I

INTRODUCTION

Veterans have been the center of many research studies related to understanding their experiences with physical, emotional, and/or psychological injuries after separating from service. Some current research has focused specifically on therapies and support services provided to veterans for rehabilitation. The purpose of these studies has been to understand the impact of various treatment interventions on different injuries, such as decreased symptoms of Post-Traumatic Stress, depression, and anxiety (Duvall & Kaplan, 2014; Townsend et. al, 2018). Few studies have explored the positive outcomes that have occurred for veterans in the form of Post-Traumatic Growth (PTG).

PTG is the idea that positive psychological changes can occur after an individual experiences a traumatic event. People demonstrate growth in the form of new possibilities, greater appreciation for life, recognition of personal strengths, relating to others, and spiritual changes (Tedeschi et. al, 2018). Engagement in meaningful recreation, such as recreational therapy treatment, is believed to provide individuals opportunities to explore and reflect on themselves (Chun & Lee, 2010; Harmon, 2019;

Hefferon, et. al, 2008). Current research about PTG and veterans suggest that those living more active lifestyles are more likely to experience PTG and greater levels of mental function and general health (Chen et. al, 2020; Tsai et. al, 2014).

Recreation has become recognized as a complementary form of treatment for veterans seeking to address medical and transitional issues (Davis-Berman et. al, 2018; Hawkins et. al, 2016). The use of outdoor recreation for veterans in particular, has become a favored intervention. Researchers have reported outcomes such as improved physical and social skills in addition to the opportunity for veterans to utilize their military skills (Davis-Berman et. al, 2018; Hawkins et. al, 2016; Duvall & Kaplan, 2014).

Veterans can access outdoor and nature-based recreational programs through community-based nonprofits (Townsend et. al, 2018). Heroes on the Water (HOW) is an example of a nonprofit providing such opportunities. HOW is an organization that provides kayak fishing events in communities across the county (*About*, n.d.; Winston, personal communication, 2021). Matise and Price-Howard (2017) suggested that HOW programs could offer an opportunity for veterans to experience growth.

This study is aimed at adding to the growing body of information focusing on PTG in veterans by researching HOW programs. Veterans will voluntarily participate in an electronic survey exploring the impact of kayak fishing on PTG. Results will be analyzed in hopes to provide beneficial findings about the veterans' experiences in outdoor and nature-based interventions as an alternative or complementary form of therapy.

Statement of the Problem

There has been a significant amount of research conducted on military veterans diagnosed with and receiving treatment for post-traumatic stress. The focus is overwhelming

centered on resiliency. However, there is increasing interest but less exploration about growth that also occurs as a result of the traumatic experiences these individuals encountered during their time in service. Present research about growth post-trauma recognizes the potential role recreation places in promoting and identifying the positive changes that happen. There is also a significant amount of research about the role recreational therapy plays in providing treatment for veterans. In particular, the use of outdoor and nature-based intervention. Yet, there is little understanding about the use of recreational therapy to facilitate Post-Traumatic Growth, in veterans. This gap in knowledge highlights a concern about acknowledging and promoting the positive outcomes that can occur for veterans who have experienced trauma (Matise & Price-Howard, 2017; Mikal-Flynn et, al, 2018). It also presents a theory that has been overlooked by recreational therapists that explains the benefits of engaging this type of treatment. This quantitative study will collect data to address the lack of knowledge about the use of kayak fishing as a potential facilitator for Post-Traumatic Growth in veterans.

Purpose and Questions

This study will address the gap in knowledge that exists between the use of recreational therapy to facilitate Post-Traumatic Growth (PTG) in veterans. In this study, the Post-Traumatic Growth Inventory (PTGI) will be used to measure the growth military veterans may experience while participating in kayak fishing through HOW.

This study hopes to answer the following questions:

- How do Post-Traumatic Growth Inventory (PTGI) scores overall differ pre and post engagement in kayak fishing?
 - H_0 : Kayak fishing will not have a statistically significant impact on PTGI scores

- H₁: Kayak fishing will have a statistically significant impact on PTGI scores
- How do Post-Traumatic Growth Inventory (PTGI) scores within 1 or more domains differ pre and post engagement in kayak fishing?
 - H₀: Kayak fishing will not have a statistically significant impact on PTGI scores within 1 or more domains
 - H₁: Kayak fishing will have a statistically significant impact on PTGI scores within 1 or more domains

Limitations

- Small sample size requiring the use of nonparametric statistics and limiting ability to make broader generalizations
- Information about the use of recreational therapy, specifically therapeutic kayak fishing, to facilitate PTG is limited
- Participants may not complete entire electronic survey

Assumptions

- Participants experienced trauma during their time of service
- Participants have an undisclosed disability-physical, emotional, and/or mental
- Participant will complete entire electronic survey

Definition of Terms

- Sense of coherence-is the theory about individual's ability to cope and make meaning of stressful events through predictability and manageability of the world around them (Arya & Davidson, 2015; Lee et. al, 2018).
- Post-Traumatic Growth-is the theory about the positive outcomes individuals may experience after a traumatic or highly challenging event (Tedeschi, et. al, 2018).

- Military veteran-is an individual who has served and was discharged or released from active military, naval, or air service (U.S. Department of Veterans Affairs, 2019).
- Recreational Therapy-meaningful recreational activities that promote a sense of independence, community engagement, functional skill development, and improved quality of life (Townsend et. al, 2015).
- Outdoor and nature interventions- includes adventure therapy, outdoor adventure education, wilderness therapy, outdoor experiential therapy and ecotherapy (Hawkins et. al, 2016; Porter, 2016). This study will focus specifically on kayak fishing.
- Heroes on the Water-a nonprofit organization provides community and therapeutic kayak fishing events for veterans (*About*, n.d.; Winston, personal communication, 2021).

CHAPTER II

LITERATURE REVIEW

Sense of Coherence

Aaron Antonovsky shared his concept of Sense of Coherence (SOC) in 1979.

Antonovsky formally defined SOC as:

“a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external environments in the course of living are structures, predictable, and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are challenges worth of investments and engagement.” (Ying et. al, 1997)

In summary, this definition explains that a person’s confidence in predicting and managing challenging situations using “psychological resources” (p. 1, Lee et. al, 2018) is connected to how they cope with stress and understand the world around them (Arya & Davidson, 2015; Lee et. al, 2018).

Antonovsky developed this theory to illustrate the importance of embracing a salutogenic health model. Antonovsky used this model to explain that people move along a continuum of health from health ease to disease (Super et. al, 2015). Stressful events move people along the continuum as a result of their ability to manage these experiences. The more successfully a person could cope with stress, the closer to the

health ease end of the continuum they were (Super et. al, 2015). The salutogenic model transitioned the focus from treating the disease to enhancing an individual's health overall by focusing on what promotes health (Cam & Demirkol, 2019; Griffiths, 2009)). Antonovsky recognized that economic, social, cultural, political, and biological factors can increase stress and increase illness. He believed that improving a person's internal and external resources would allow them to manage stress more effectively, improving their SOC (Cam & Demirkol, 2019). The stronger the SOC the better someone can cope with stressful situations and the better health they are in. When SOC is weak a person is at risk of decreased confidence for managing stressful events and poor health (Ying et. al, 1997).

SOC is composed of 3 main components: comprehension, manageability, and meaning. Comprehension is the cognitive aspect determining to what level a person understands their situation and environment. Understanding of a situation explains how predictable a situation is perceived providing structure and making the situation explainable (Lee et. al, 2018; Cam & Demirkol, 2019). Manageability is about how well a person believes they can handle a stressful stimulus with current personal resources. This is the behavioral piece of SOC and involves awareness and utilization of generalized resistance resources (Lee et. al, 2018; Cam & Demirkol, 2019). Meaning is the motivational component of SOC aimed at understanding the amount of investment a person thinks a challenge is worth cognitively and emotionally, or how willing is a person to deal with the specific confrontation (Cam & Demirkol, 2019; Griffiths, 2009; Lee et. al, 2018). This component is considered the most important because if an

individual perceives a stressful event as unmanageable, they will not have the drive to understand and cope with future stressful situations (Arya & Davidson, 2015).

Antonovsky identified generalized resistance deficits (GRD) and generalized resistance resources (GRR) as factors that impact individuals' ability to cope with stressful events, strengthening or weakening their SOC (Camm & Demirkol, 2019; Lee et. al, 2018; Super et. al, 2015; Ying et. al, 1997). GRD's are stressors that can promote feelings of chaos and disintegration. These stressors negatively impact the components of SOC by challenging the ability to comprehend life, decrease resources impacting the ability to manage stress, and trigger questions about life's meanings. As a result, SOC weakens and decreases health (Ying et. al, 1997).

GRRs are individual or environmental resources that, when used successfully, can aid in managing stress reducing the risk of mental health disturbances (Lee et. al, 2018; Super et. al, 2015; Ying et. al, 1997). These resources can be physical, artefactual, cognitive, emotional, social, or macrosocial (Griffiths, 2009). Antonovsky suggests that GRRs determine the strength of an individual's SOC and are a crucial element in influencing coping skills central to recovery after stressful events (Griffiths, 2009). Recreation can support in developing these resources which can aid in strengthening SOC thus impacting mental health function by providing social relationships, sense of identity, and improved health (Lee, Payne, & Berdychevsky, 2018). Bengtsson-Tops and Hansson (2001) emphasize the importance of providing activities that are challenging and have social aspects to promote a sense of meaningfulness and strong support system. A strong social support system is linked to strong SOC (Griffiths, 2009).

In order to strengthen SOC, researchers suggest that mindfulness programs are especially beneficial in this process. Interventions that are oriented around empowerment and reflection are the most impactful (Super et. al, 2016). Multiple authors also promote the use of a salutogenic approach to strengthen SOC (Griffiths, 2009; Super et. al, 2015). It is believed that through supporting human health and well-being and intentional, “proactive measures” there will be “tangible improvements” in an individual’s SOC (p. 75, Griffiths, 2009).

Post-Traumatic Growth

Defining Post-Traumatic Growth

The theory of Post-Traumatic Growth (PTG) was developed by Richard Tedeschi and Lawrence Calhoun in the early 1990s. While they were conducting research focused on understanding wisdom, Tedeschi and Calhoun noticed a trend of growth in the aftermath of trauma (Tedeschi, et. al, 2018). This phenomenon of growth had previously given many names such as positive psychological changes, perceived or construing benefits, stress related growth, discovery of meaning, flourishing, thriving and adversarial growth (Tedeschi, et. al, 2015, p. 504). Tedeschi, et. al (2015) identified four defining characteristics of PTG as “(a) it occurs most distinctively in conditions of severe crisis rather than lower-level stress; (b) it is often accompanied by transformative life changes that appear to go beyond illusion; (c) it therefore is experienced as an outcome rather than a coping mechanism; and (d) it often requires a challenging of basic assumptions about one’s life that thriving or flourishing does not imply” (Tedeschi, et. al, 2015, p. 504). The overall concept is that there can be positive psychological changes because of a traumatic or highly challenging life event (Tedeschi, et. al, 2018).

Traumatic events could be anything that results in shaking the core beliefs of an individual and making them question the reality of their assumptive world (Joseph, 2011). An individual's assumptive world is comprised of their understanding of who they are, the people around them, their place in the world, and possibilities for their future (Tedeschi et. al, 2015). It is important to recognize that an individual does not have to be diagnosed with Post-Traumatic Stress Disorder to experience PTG. The key component is that the person experienced or witnessed a seismic traumatic event(s). The seismic event could be a serious illness, abuse, natural disaster, death, or a situation that could result in someone re-evaluating their core beliefs about the world (Tedeschi et. al, 2018).

After trauma has occurred, some individuals are resilient meaning their reality allows them to bounce back from their traumatic experience. Others struggle long after the event and are diagnosed with Post-Traumatic Stress Disorder. Another group of people will experience a period of transformative growth, or PTG, resulting in a cognitive, emotional, behavioral, or biological change(s). Through the PTG process people begin to rewrite their narrative to understand their reality (Tedeschi, et. al, 2018).

Figure 1

Post-Traumatic Growth Domains



Note. Figure 1 provides a summary of the domains that exist within the PTG theory. These domains are categories for how an individual may demonstrate growth and are further elaborated below (Phoenix Center, 2019).

The theory of PTG is said to manifest in 5 domains: Spiritual Changes, Personal Strengths, Relating to Others, Appreciation for Life, and New Possibilities. Spirituality is often associated with religion but in this context, the reference is associated with existential changes that may occur. Individuals experiencing PTG may take more time to reflect on their interconnection with others, harmony, and morality. Self-reflection being an important element into finding meaning, purpose, and narrative development post-trauma (Tedeschi, et. al, 2018). One may express their growth in the Spiritual domain with a statement such as “I have a new sense of meaning and purpose in my life” (McGonigal, 2012).

The Personal Strengths domain involves an increased sense of self-reliance, embracing the perception of being a survivor versus a victim. Changes in Personal Strengths can be present in the form of behavioral changes where people may engage in more challenging activities or learning something new (Tedeschi, et. al, 2018). A person

may verbalize their recognition of personal strengths by stating “I understand myself better now. I know who I really am” (McGonigal, 2012).

The Relating to Others domain focuses on relationships. Individuals may feel a need to develop deeper or new bonds with others. They may also experience a greater sense of comfort expressing themselves emotionally. Changes in relationships can result in building stronger bonds and/or cutting ties with certain people that the individual decided were not having a positive impact on their life (Tedeschi, et. al, 2018). A person may express these changes by stating, “I feel closer to my friends and family” (McGonigal, 2012).

The Appreciation for Life domain refers to increased appreciation and recognition of the small things that are often taken for granted such as the beauty of nature. The Appreciation for Life domain can also be present in conjunction with Relating to Others in the form of greater appreciation for the people around them (Tedeschi, et. al, 2018). Changes in the Appreciation for Life domain may be recognized through statements such as, “My priorities have changed” (McGonigal, 2012).

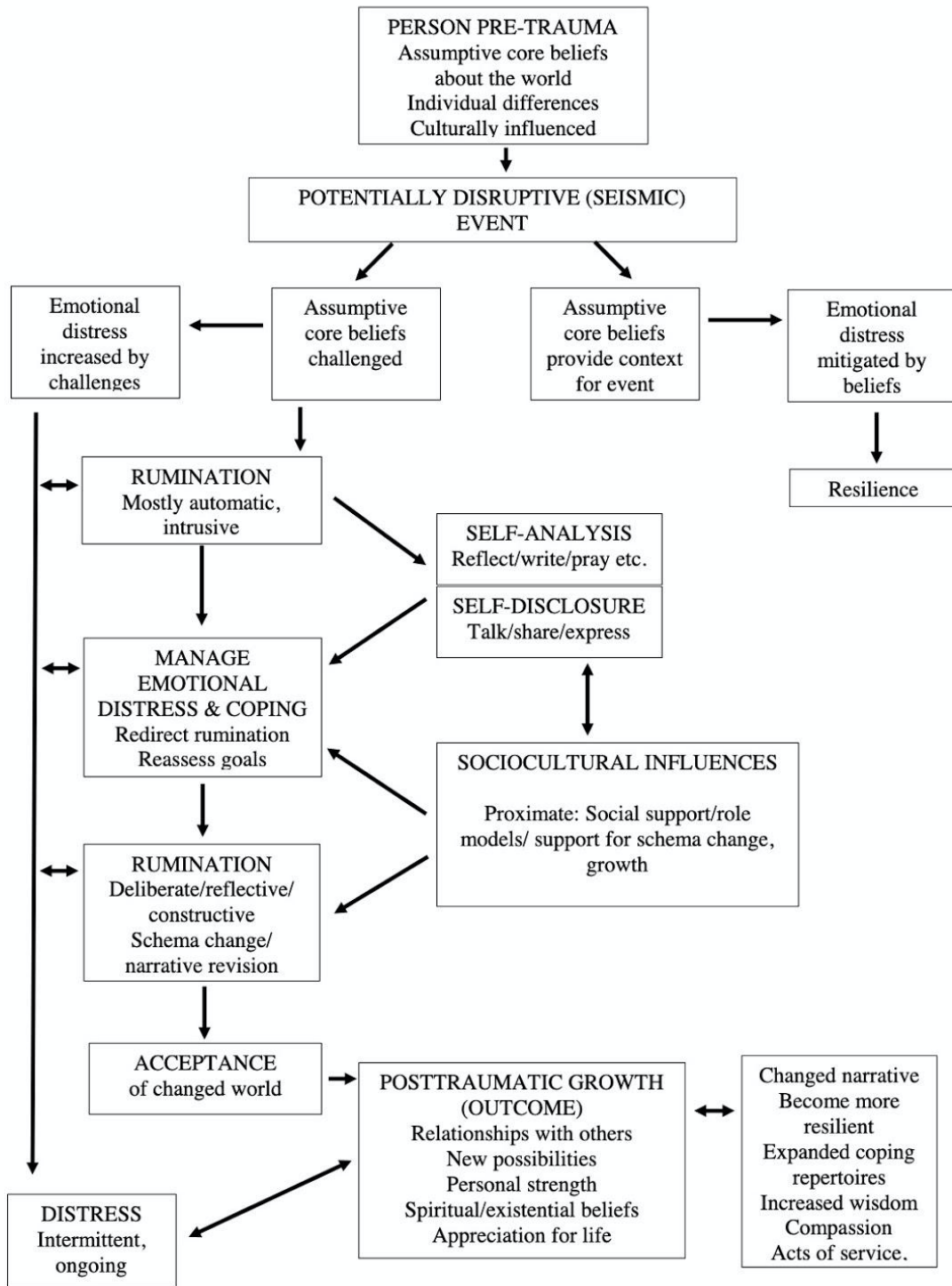
The New Possibilities domain refers to experiencing new things or choosing a different life path. This could range from trying new activities, also tying to the domain personal strengths if they are new and challenging, to following a new career path (Tedeschi, et. al, 2018). Individuals verbalizing changes in this domain may say something similar to “My priorities have changed,” and/or, “I am better able to focus on my goals and dreams” (McGonigal, 2012).

Post-Traumatic Growth Model

Tedeschi, et al (2108) present the PTG Model depicting the possible experiences of an individual starting pre-trauma. The Model of PTG is presented in Figure 1. This depiction of the PTG Model consists of the components and transitions that can occur when a person is experiencing growth following a traumatic event. Though the PTG model is presented as a flow chart, the process of growth is not a linear process. The arrows throughout the model highlight the multidirectional characteristics of PTG with an emphasis on distress being intermittent and ongoing (Tedeschi et. al, 2018).

Figure 2

Post-Traumatic Growth Model



Note. Figure 2 is a visual representation of the PTG model. Further elaboration of the model is provided below. From Chapter Title by R.G. Tedeschi, J. Shakespear-Finch, K. Taku, and L.G. Calhoun, 2018, *Posttraumatic Growth: Theory, Research, and Applications* p. . Copyright 2018 by Routledge Publishing.

Tedeschi et. al (2018) discusses the PTG Model by breaking the model down into core components as presented in Table 1.

Table 1

PTG Model Components
The person pre-trauma
Seismic traumatic event
Challenges to core beliefs
Intrusive rumination
Managing and coping with emotional distress
Deliberate rumination
Self-disclosure and social support
Post-traumatic growth, narrative development, and wisdom
Enduring distress from trauma

Note. Simplified list of PTG Model components. Listing of components does not mean the model follows as linear process as illustrated in Figure 2 (Tedeschi, et. al, 2018).

The person pre-trauma is focused on characteristics of an individual prior to a traumatic event. There are four key factors identified that influence a person’s growth. These factors include demographics (i.e., gender and religious status), personality traits and cognitive tendencies (i.e., hope, extraversion, or openness), mental health status, and their assumptive world prior to trauma (Tedeschi, et. al, 2018).

Then a catastrophic, or seismic, traumatic event happens such as divorce, death, or abuse, threatening a person's assumptive world, shaking their core beliefs and invalidating thoughts such as "my world is safe" (Tedeschi, et. al, 2015, p. 507). Once a traumatic event occurs, people respond by either a) rationalizing the event and navigating emotional stress utilizing their core beliefs demonstrating resiliency or b) challenging their core beliefs and experiencing increased emotional distress (Tedeschi, et. al, 2018).

After an individual's core beliefs are challenged the model focuses on the cognitive engagement as the individual experiences increased emotional distressed post-trauma and the potential development of rumination. There are two types of rumination: intrusive rumination and deliberate rumination. Intrusive rumination is a natural response as a result of trauma. It frequently involves individuals experiencing unwanted memories or nightmares of the catastrophic event causing the trauma. The related intrusive thoughts and images are uncontrolled, but these intrusive thoughts tend to fade over time into deliberate rumination. Deliberate rumination is an intentional reflection of the traumatic event by the individual to understand what occurred in search for meaning (Tedeschi et. al, 2018). This reflective process is believed to be one's initial attempt to revise their core set of beliefs, adapt to the changed circumstances, and begin to develop new life goals (Tedeschi et. al, 2015; Tedeschi et. al, 2018). Individuals transition from intrusive to deliberate rumination because of coping and managing emotional distress which could last for months or years and requires the work of self-disclosure, reflection, and utilization of social supports (Tedeschi et. al, 2015; Tedeschi et. al, 2018).

The self-disclosure and reflection component of the PTG model occur in conjunction with the transition from intrusive to deliberate rumination. The use of

reflective aspects and social supports are considered necessary components to managing emotional distress and cope with trauma. Reflection and self-disclosure can occur in the form of talking, writing, and creative expression (i.e., drawing and dance) (Tedeschi et. al, 2018). The process of self-disclosure can alleviate initial distress, encourage cognitive processing, offer an avenue for acknowledgement of unconscious thought and feelings, and establish support, all of which are necessary to experience growth (Tedeschi, 2018). A study by Ulrich and Lutgendorf (2002) demonstrated that students who journaled about their emotional response to trauma experienced greater levels of PTG (Tedeschi et. al, 2015). The most significant part of disclosure are the responses from the individual's network (Tedeschi et. al, 2018). Studies suggest that supportive responses to self-disclosure can result in meaningful outcomes despite the stress that may still be present. An individual's social network and social cultural influences can be a predictor of PTG. Social networks can also act as a mediator for PTG providing an outlet for individuals to share their intrusive thoughts aiding in the narrative reconstruction process and be a form of presentation of PTG as evidenced by the Relating to Others domain (Tedeschi et. al, 2018).

Narrative development, wisdom, and PTG are the last components of the model. The authors suggests that narrative reconstruction is an outcome of growth and acceptance of an individual's changed world. Narratives can be broken into exploratory and redemptive processing. Redemptive processing involves transforming a negative event into an emotional positive one offering a sense of closure and resolution. Exploratory process is centered on self-reflection with an emphasis on meaning making and growth as a result of the past. Exploratory narrative development is believed to be

closely connected to wisdom and growth because of the reflection component that is naturally fostered through this process (Tedeschi et. al, 2018).

Tedeschi et. al (2018) emphasize the unique aspect about the PTG Model is that distress continues to be present while an individual experiences growth. Though it is suggested that emotional distress is less than after the initial trauma, distress may still be intermittently present while an individual also experiences well-being and growth. The model also recognizes that not everyone will experience growth. Some individuals will experience emotional distress and manage it with the help of their core beliefs resulting in resilience instead of growth (Tedeschi, 2018).

Resiliency vs Post-Traumatic Growth

Resiliency is recognized as an individual's ability to return to the highest level of functioning possible, or their ability to "bounce back," after exposure to a traumatic event (Angel, 2016). Researchers report that resilient people have an optimistic perspective of life, are able to face their fears, and have developed a positive support network. They can positively cope with catastrophic events making it easier to understand and navigate their new reality (Angel, 2016).

Resiliency differs from PTG because of the lack of reflective rumination necessary for growth. Thus, resilient people experience less PTG (Angel 2016; Tedeschi & McNally, 2011; Tedeschi, 2011). However, researchers have suggested that a relationship exists between resiliency and PTG, reporting that growth can lead to increased resilience should another trauma occur, also described as psychological preparedness (Angel, 2016; Tedeschi & McNally, 2011; Tedeschi, 2011; Tedeschi, 2018).

Post-Traumatic Growth Inventory

The Post-Traumatic Growth Inventory (PTGI) is a 21-item survey consisting of questions that address each of the five PTG domains. Utilizing a 0-5 Likert scale, the PTGI requires individuals to indicate to which degree they experienced change as a result of a traumatic event. Zero signifies the individual did not experience change because of a trauma. Five represents an individual experiencing change to a very great degree because of trauma. Each question is associated with one of the five PTG domains: relating to others, new possibilities, personal strengths, spiritual change, and appreciation of life. The PTGI is scored by adding all the responses together. Each PTG domains can also be evaluated by calculating the score for specific questions within each domain (Tedeschi & Calhoun, 2006).

The PTGI was originally developed with 34 items and was reduced to 21. After a series of studies in the 1990s, Tedeschi and Calhoun (1996) determined that the 21-item scale had an internal consistency score of $\alpha=.90$ and test-retest reliability score of $r=.71$. The validity of PTGI is reported to be $r=.69$ and results are supported by confirming information of those close to the individual completing the inventory (Cann, et al., 2010). The PTGI is free to use for research by the authors under the assumption the study results are shared in the form of a gratis copy of the written product (Tedeschi & Calhoun, 2006).

Military Veterans

Veterans ending their military service can be discharged due to complex injuries and/or traumatic injuries because of their job duties. Spinal cord injuries, blast injuries, limb loss, and brain injuries are among the physical injuries commonly reported among

the veteran population (Hawkins et. al, 2016; Townsend et. al, 2015). Brain injuries (BI) may be open or closed injuries impacting individuals' cognitive, psychological, and physical functioning. Closed BI are likely impact injuries or concussions that do not break the skull. Open BI are the result of outside objects, such as shrapnel from bombs, penetrating this skull and damaging the brain. BI are a common diagnosis among veterans returning from the Global War on Terror (Hawkins et. al, 2016; Townsend et. al, 2015). Spinal cord injuries (SCI) include partial or complete paralysis of limbs as the result of vehicle accidents, gunshots, or blast remains. Examples of blast remains include pieces of artillery, shrapnel, and other explosive devices. The location of the SCI determines the level of muscular and sensory functioning. Blast injuries encompass injuries caused by various explosive devices and artillery. Veterans may experience sensory injuries, SCI, BI, bone fractures, and loss of limbs. Limb loss refers to the amputation of a body part, for example an arm above or below the elbow or a leg above or below the knee. It also includes the amputation of fingers or parts of the hand or foot (Townsend et. al, 2015).

In addition to health services centered around treatment for physical injuries, there is an increasing need for health services for treating emotional and psychological injuries. Examples of such emotional and psychological injuries include post-traumatic stress, depression, and anxiety (Carrola & Corbin-Burdick, 2015; Hawkins et. al, 2016; Maynard et al., 2017; Townsend et. al, 2015). These diagnoses are considered invisible wounds due to the difficulty recognizing signs and symptoms. Anxiety may be present in the form of excessive worry over different issues, large and small, poor concentration, irritability, and sleep disturbances over six months or more. Symptoms of depression

include sadness, hopelessness, depressed mood, and lack of motivation and interest (Townsend et. al, 2015).

Post-traumatic stress (PTS) is another common diagnosis reported in veterans who served in the Global War on Terror (Hawkins et. al, 2016; Townsend et. al, 2015). PTS is characterized by intrusive rumination in the form of flashback and nightmares, avoidance, hypervigilance, disrupted sleep, and strong negative emotions such as increased anger or irritability (Townsend et. al, 2015; Westlund, 2014). Depression and anxiety are comorbidities that accompany PTS (Poulsen et. al, 2018; Townsend et. al, 2015). This diagnosis is also associated with increased pain, physical symptoms, and poorer health overall (Poulsen et. al, 2018).

Veterans may also experience a combination of multiple injuries or polytrauma. Polytrauma impacts multiple parts of the body because of the complex injuries and include physical, psychological, and emotional (Townsend et. al, 2015). According to the Veterans Health Administration, approximately 49% of veterans returning from the most recent wars screen positively for polytrauma (Hawkins et. al, 2016). Veteran injuries are further exacerbated by exposure to other trauma, including sexual trauma, substance abuse, and family related issues (Carrola & Corbin-Burdick, 2015; Hawkins et. al, 2016; Maynard et al., 2017; Townsend et. al, 2015).

Additional challenges post-military

According to Rasmussen Reports (2015), veterans identify their transition to civilian life as their most difficult challenge. Aspects impacting their transition include inability to find employment and health care services. Some veterans are finding their present skill set and training does not easily transfer to the civilian sector (Westlund,

2014). While veterans attempt to manage their physical, mental, and/or emotional health, they are also challenged with navigating family and relational issues, financial problems, substance abuse, and other medical disabilities impacting their integration and growth after separating from the military (Carrola & Corbin-Burdick, 2015; Joshi, 2019; Rasmussen Reports, 2015).

Treatment Intervention

Hawkins et. al (2016) report that current rehabilitation and health services center around treating PTS and BI. Favored interventions include the use of Cognitive Behavioral Therapies (CBT), Eye Movement Desensitization and Reprocessing (EMDR), and medication (Hawkins et. al, 2016). Therapist using CBT teach individuals to identify and challenge maladaptive, or dysfunctional, thoughts by examining evidence, defining terms, and evaluating logic. Maladaptive thoughts are then replaced with productive, adaptive thoughts improving cognitive processing and function (Carruthers & Hood, 2016). CBT techniques may include exposure therapy, cognitive restructuring, and stress inoculation therapy and requires clients to complete homework outside of their treatment sessions (Hawkins et. al; 2016). EMDR is used to process trauma enabling individuals neurologically heal resulting in cognitive changes (EMDRIA, 2019). Using bilateral stimulation, usually eye movement, while individuals also briefly focus on the traumatic memory, EMDR has demonstrated decreased intensity and emotion connected to the trauma (APA, 2021).

In response to an increased need of veteran health care services, veterans have turned to alternative forms of treatment, such as the use of recreation. Recreation has served as complimentary, adjunctive, or primary care helping veterans “adjust to

community life, cope with disability, and control symptoms of mental health conditions through participation...” (Hawkins et. al, 2016, p. 58).

Military and Post-Traumatic Growth

Studies exploring PTG among veterans have demonstrated that those diagnosed with PTS have reported at least moderate levels of growth. Individuals with moderate PTS presented with the more optimal levels of growth, than those with minimal symptoms (Angel, 2016; Tedeschi, 2011). Existing studies of veterans from the Persian Gulf War and Vietnam War relay that even prisoners of war identified growth from their traumatic experience during service (Tedeschi, 2011).

Promoting PTG in veterans may encourage greater mental functioning and general health in veterans, particularly those diagnosed with PTS (Tsai et. al, 2014). Studies have suggested that veterans with more active lifestyles encourage and maintain levels of PTG (Chen et al., 2020). Tsai et al. (2014) also support previous research that demonstrates journaling and expressive writing as interventions encouraging reflection are useful for facilitating PTG (Tsai et. al, 2015).

Additionally, expert companionship is a necessary component to facilitating PTG (Tedeschi et al., 2018; Tedeschi, 2011). The role of the expert companion is to listen patiently and nonjudgmentally. This role also requires professionals to understand and explain physiological and psychological responses common after experiencing a catastrophic event, clarify that growth is a result of the impact of the event and not of the event itself, and recognizes when growth may not occur (Angel, 2016; Tedeschi et al., 2018; Tedeschi, 2011). As an expert companion, professionals (such as a Recreational Therapist) provide an environment that promotes vulnerability as a strength and loss as a

form of change (Tedeschi, 2011). The duties of an expert companion emphasize a person-centered approach aligning with the role

Recreational Therapists play in supporting veterans (Mikal-Flynn et. al, 2018).

Recreational Therapy

Recreation based intervention has demonstrated positive rehabilitative and reintegrative outcomes for veterans (Townsend et. al, 2018). In particular, Recreational Therapy (RT) has been used to promote independence, community engagement, functional skill development, and improve quality of life in veterans (Townsend et. al, 2015). RT utilizes a holistic approach to treatment by addressing physical, cognitive, emotional, social, and community functioning through recreation following the RT process (Austin et. al, 2015; Hawkins et. al, 2016; Townsend et. al, 2015).

The RT process consists of five components: assessment, planning, implementation, evaluation, and documentation. This process is also referred as APIED. This systematic process requires the collection of data about the individual seek treatment (assessment). Data will include information about problems, concerns, strengths, and needs (Austin, 2015). A key component that has demonstrated success in treatment for veterans is the utilization of the strengths-based approach. Strengths may include internal factors-attitudes and beliefs, skills, knowledge, aspirations, talents, and virtues-and external factors-support system, participations opportunities, resources, and community (Hawkins et. al, 2016).

Based on assessment information, Recreational Therapist will then develop a plan to select interventions that will address problems and concerns (planning). Next the intervention will be implemented followed by an evaluation of the effectiveness of plan.

Lastly, the outcomes are documented including outcomes and direction for future treatment. The RT process is cyclical and continuous (Austin, 2015).

RT treatment focused on physical functioning will address issues related to specific neuromuscular functioning. Examples of neuromuscular function include muscle strength, tone, and endurance, fine and gross motor skills, range of motions, and control of voluntary movements. Physical treatment will also address concerns such as pain management. Treatment for cognitive functioning will address impairments in memory, attention span, problem solving, judgement and expressive language.

Emotional/psychological functioning involves treatment centered around stress management, coping skills, emotional regulation and expression, motivation, self-efficacy, and post-traumatic growth. Though emotional/psychological functioning may not be the primary concern or diagnosis, RT treatment should consider the need to address these underlying impairments. RT treatment centered around social functioning incorporates interactions with family, friends, and others. Treatment goals will focus on promoting effective communication, processing emotions, and developing and maintaining connections. Community functioning is a key component of treatment for veterans as they adjust to civilian life and their new normal. RT treatment will focus on identifying barriers and facilitators for participation through community outings. When addressing community functioning RT treatment may incorporate development of other functional skills previously discussed (Townsend et. al, 2015).

Yoga, adaptive recreation and sports, therapeutic camps and outdoor recreation, art and music, virtual reality, leisure education, animal-assisted therapy, and community outings are common RT interventions utilized for veterans (Townsend et. al, 2015).

Interventions are programs that are facilitated by Recreational Therapists and selected through the creation of a treatment plan. Developing a treatment plan requires Recreational Therapists to identify individuals' strengths and needs to set priorities. Then goals and objectives are developed providing specific direction to the plan. Next the Recreational Therapist determines actions and strategies to meet identified goals. Lastly, methods to access and track progress towards goals are chosen. (Austin, 2015). RT interventions are modified to match individuals' abilities and interests (Townsend et. al, 2015). This study will focus on the use of outdoor and nature-based recreation interventions, specifically kayak fishing.

Nature Acting as a Co-Therapist

A study by Dustin et. al (2011) suggested that traditional interventions for mental health problems are generally ineffective for veterans. For this reason, alternative treatment such as outdoor and nature-based interventions are being utilized (Davis-Berman et. al, 2018; Hawkins et. al, 2016). Outdoor and nature-based inventions consist of 5 different types of programs such as adventure therapy, outdoor adventure education, wilderness therapy, outdoor experiential therapy and ecotherapy (Hawkins et. al, 2016; Porter, 2016). What connects these different types of outdoor and nature-based interventions is the role of nature acting as a co-therapist (Hawking et. al, 2016).

Hawkins et. al (2016) suggests that nature-based interventions encourage positive behavior changes which has been described to be connected to psychological well-being and healing. Research demonstrates that changes occur through skill development, role modeling by peer and/or instructor, and opportunities for individuals to directly link their experiences with therapeutic goals in a nonmedical environment. Per Hawkins et. al

(2016), veterans seem particularly drawn to outdoor and nature-based interventions due to the opportunity to utilize their military skill.

Additionally, Davis-Berman et. al (2018) report outdoor interventions provide opportunities for veterans to develop self-esteem, practice conflict resolution, improve physical and social skills, and promote a sense of belonging all while having fun (Davis-Berman et. al, 2018; Duvall & Kaplan, 2014). Additional researchers suggest that veterans participating in outdoor recreation have experience improved mood, decreased symptoms of PTS, depression, and anxiety, increase motivation, improved perceptions of disability, marital satisfaction, improved psychological well-being, and community integration (Duvall & Kaplan, 2014; Townsend et. al, 2018).

Heroes on the Water

Community-based nonprofit programs have become a growing resource for veterans seeking services ranging from housing and employment assistance to memorial celebrations, week-long retreats, and local community programs (Townsend et. al, 2018). Heroes on the Water (HOW) is an example of a nonprofit supporting veterans through facilitating community and therapeutic kayak fishing events (*About*, n.d.; Winston, personal communication, 2021).

HOW was founded in 2007 by Jim Dolan with the purpose of serving veterans and their family members by providing inclusive kayak fishing experiences (*About*, n.d.). Programs are provided by volunteer chapter leaders free of charge to participants of all skill levels. Chapter leaders ensure they have kayaks and equipment available for all to use, making adaptations as needed (*About*, n.d.; *Programs*, n.d.). Chapters exist across the United States and affiliates in the United Kingdom, and Australia (Winston, personal

communication, 2021). In 2018, HOW expanded their services to include first-responders and their families (*About*, n.d.).

Matise and Price-Howard (2017) studied the impact of HOW programs related to PTS symptoms. The results demonstrated decreased stress, re-experiencing, avoidance, and hyper-vigilance. HOW reported programs provide opportunities for participants to develop physical, occupational, and mental functioning while allowing participants an opportunity to discuss their trauma in a natural environment. These researchers have suggested that HOW programs can be a facilitator of PTG and recommended continued research to explore such a phenomenon (Matise & Price-Howard, 2017).

Recreational Therapy and Post-Traumatic Growth

While the connection to RT and PTG still requires further exploration, researchers have demonstrated the positive impact of using recreation and leisure to cope with stress. Leisure and recreation provide opportunities for individuals to discover their abilities, build companionship and meaningful relationships, find meaning in everyday life, and generate positive emotions (Chun & Lee, 2010). Current research suggests that meaningful engagement in recreation and leisure has the potential to facilitate PTG by providing individuals with a space to explore themselves, develop relationships, and reflect on their lives post-trauma (Chun & Lee, 2010; Harmon, 2019; Hefferon, et. al, 2008).

Mikal-Flynn et. al (2018) further support the potential for RT to be a catalyst for PTG stating: “Recreational therapists have the tools, necessary skills, and mandate to support individuals through this process, concentrating personal awareness on prior achievements, what they have and can do. In partnership with participants, recreational

therapists help establish both short-term and long-term goals, encouraging successful reintegration into the community, and supporting posttraumatic growth (Mikal-Flynn et al, 2018, p. 283).”

Retrospective Approach

This study will utilize a retrospective pre-posttest design. A retrospective design allows participants to complete their survey in a single moment reflecting on themselves before engaging in a specified event and afterwards (Little et. al, 2020). Raidl et. al (2004) reported that results from retrospective surveys resulted in 100% completed data versus participants using the traditional pre-post survey. There is increasing research demonstrating that retrospective design allows for greater self-awareness and an opportunity to make two distinct judgements about themselves (Little et. al, 2020). In addition, researchers suggest that a retrospective design may be more sensitive and valid measure to the effects of program outcomes (Skeff et. al, 1992).

CHAPTER III

METHODS

Research Design

The purpose of this study is to determine the impact kayak fishing has on post-traumatic growth (PTG) within military veterans. We are looking specifically at veterans participating in Heroes on the Water. Heroes on the Water (HOW) is a non-profit based in Allen, Texas that strives to support and connect veterans with others and the community. The following research questions will be addressed through this study:

- How do Post-Traumatic Growth Inventory (PTGI) scores overall differ pre and post engagement in kayak fishing?
 - H_0 : Kayak fishing will not have a statistically significant impact on PTGI scores
 - H_1 : Kayak fishing will have a statistically significant impact on PTGI scores
- How do Post-Traumatic Growth Inventory (PTGI) scores within 1 or more domains differ pre and post engagement in kayak fishing?
 - H_0 : Kayak fishing will not have a statistically significant impact on PTGI scores within 1 or more domains
 - H_1 : Kayak fishing will have a statistically significant impact on PTGI scores within 1 or more domains

This study will follow a retrospective pre-posttest design using the Post-Traumatic Growth Inventory (PTGI). The PTGI requires participants to self-evaluate the level of change experienced by ranking individual statements on a 5-point Likert-scale.

These statements can be separated into the five domains of Post Traumatic Growth allowing another level of analysis.

Participants

This study will be conducted with veterans that are participating in HOW programs. This could include veterans in the role of volunteers or program participants. Research participants must have experienced trauma during their time of service, but it does not need to be a trauma associated with active-duty work. Meaning the trauma could be the result of combat during a tour overseas or a car accident when off-duty. Research participants will not have to elaborate on their traumatic experience due this study focusing on growth. Participants do not have to be diagnosed with post-traumatic stress because it is not a necessary component for experiencing PTG (Tedeschi, et al., 2018).

Sample

Convenience census sampling will be utilized for this study due to the ease of accessibility for the specified population. The sample will consist of veterans participating HOW. All members of sample are voluntary.

Data collection

Data will be collected using the Post-Traumatic Growth Inventory (PTGI) in the form of a retrospective pre-posttest survey. Retrospective pre-post design allows participants to complete their survey in a single moment reflecting on themselves before engaging in kayak fishing and afterwards. Research increasingly demonstrates that retrospective design allows for greater self-awareness and self-reflection allowing individuals to make two distinct judgements about themselves (Little, et al., 2020; Skeff et. al, 1992). The PTGI will be distributed electronically using Qualtrics. The electronic

survey will be dispersed by HOW through email to the participant network March 15, 2022. The survey will remain open until March 31, 2022.

Instrument

The Post-Traumatic Growth Inventory (PTGI) will be used. The PTGI is a 21-item survey using a 0-5 Likert scale to indicate to which degree an individual experienced change because of a traumatic event. Zero signifies the individual did not experience change and five represents an individual experiencing change to a very great degree. The PTGI is scored by adding together the responses. Individual domains can be evaluated by evaluating scores for specific questions associated with specified domain (Tedeschi & Calhoun, 2006).

The PTGI has an internal consistency score of $\alpha=.90$ and test-retest reliability score of $r=.71$. The validity is reported to be $r=.69$ and is further confirmed by information provided by those close to the individual completing the inventory (Cann, et al., 2010; Tedeschi & Calhoun, 1996). Tedeschi and Calhoun (2006) have made the PTGI accessible to researchers at no cost under the assumption the study results are shared in the form of a gratis copy of the written product (Tedeschi & Calhoun, 2006).

Data Analysis

Data will be analyzed as a case report. Case reports allow researchers to review unique diagnoses and treatment interventions to explore their impact and potentially encourage more research for further education (Khalil & Mishra, 2016; Nissen & Wynn, 2014). This study will follow the “rule of C’s”- providing case reports that are clear, concise, coherent, and convey a “crisp” message (Das & Singh; 2021; Haq & Dhammi, 2017).

It is recognized that with this study, generalizations cannot be made with a case report (Nissen & Wynn, 2014). However, the intent of this study is to explore the impact and potential outcomes of HOW kayak fishing on PTG encouraging continued research and education about this particular intervention. Each case report will include demographic information, total PTGI scores before and after, and PTGI scores before and after within each PTG domain. The percentage of change will also be calculated and reported in each case report for the PTGI total score and within each domain. The change percentage will be calculated by dividing the before score by the max score and subtracted it from the after score divided by the max score, $(\text{After Score}/\text{Max Score}) - (\text{Before Score}/\text{Max Score}) = \text{Change Percentage}$. Tables and graphs will be used to illustrate the data collected within each report.

Conflict of Interest Statement

This author recognizes there is potential for conflict of interest as a part-time employee of Heroes on the Water (HOW). Funding was not provided by HOW to complete this study, nor is this authors employment determined by the outcomes of this study. HOW understand the purpose is to explore the impact of their kayak fishing programs and the results may be inconclusive.

CHAPTER IV

FINDINGS

Participants

A total of 18 emails were sent from HOW requesting participation in this study. A total of 11 responses were received, meaning 61% responded. Of those 11 responses, 7 respondents completed at least 50% of the survey providing responses to the PTGI from the perspective of “After participating in HOW kayak fishing programs.” A total of 4 respondents responded to the PTGI from the perspectives of “Before participating in HOW kayak fishing program” and “After participating in HOW kayak fishing program.” Of those 4 respondents who completed the entire survey, 3 were veterans.

Table 2 provides a summary the demographic information of the 3 respondents that will be further analyzed for this study as individual case reports. Two individuals served in the Army and 1 in the Marine Corp for at least 1 year. All 3 of these veteran respondents identified as male. One respondent as 65 or older, the others were between 53 and 54 years old. Two veteran respondents identified as White and one as Other. The veteran respondents have been connected to HOW for at least 3 years, with one individual engaged for 6-9 years.

Table 2

Demographics of Analyzed Respondents			
Gender	Male: 3		
Age	65+ years: 1	35-54 years: 2	
Race	Other: 1	White: 2	
Years participating in HOW	6-9 years: 1	3-5 years: 2	
Frequency of participation	Occasionally: 1	Monthly: 2	
Branch of service	Army: 2	Marine Corp: 1	
Yeats of service	5-9 years: 1	1-4 years: 1	10-14 years: 1

Case Report 1

The respondent for Case Report 1 is a male Army veteran that fell within the 65+ years age range. This veteran served in the Army for 5-9 years. They have been connected to HOW for 6-9 years. This individual has participated in HOW kayak fishing events monthly.

Table 3

Demographics of Analyzed Respondents	
Gender	Male
Age	65+ years
Race	Other
Years participating in HOW	6-9 years
Frequency of participation	Monthly
Branch of service	Army
Yeats of service	5-9 years

This veteran’s Post-Traumatic Growth Inventory Score (PTGI) before participating in HOW kayak fishing programs was 0 out of 105 possible points. The participant’s PTGI Score after participating in HOW kayak fishing programs was 105 out of 105 possible points. As illustrated in Table 3, the veteran’s responses within each domain also changed: from 0 out of 35 to 35 out of 35 in the Relating to Other domain, 0 out of 25 to 25 out of 25 in the New Possibilities Domain, 0 out of 20 to 20 out of 20 in

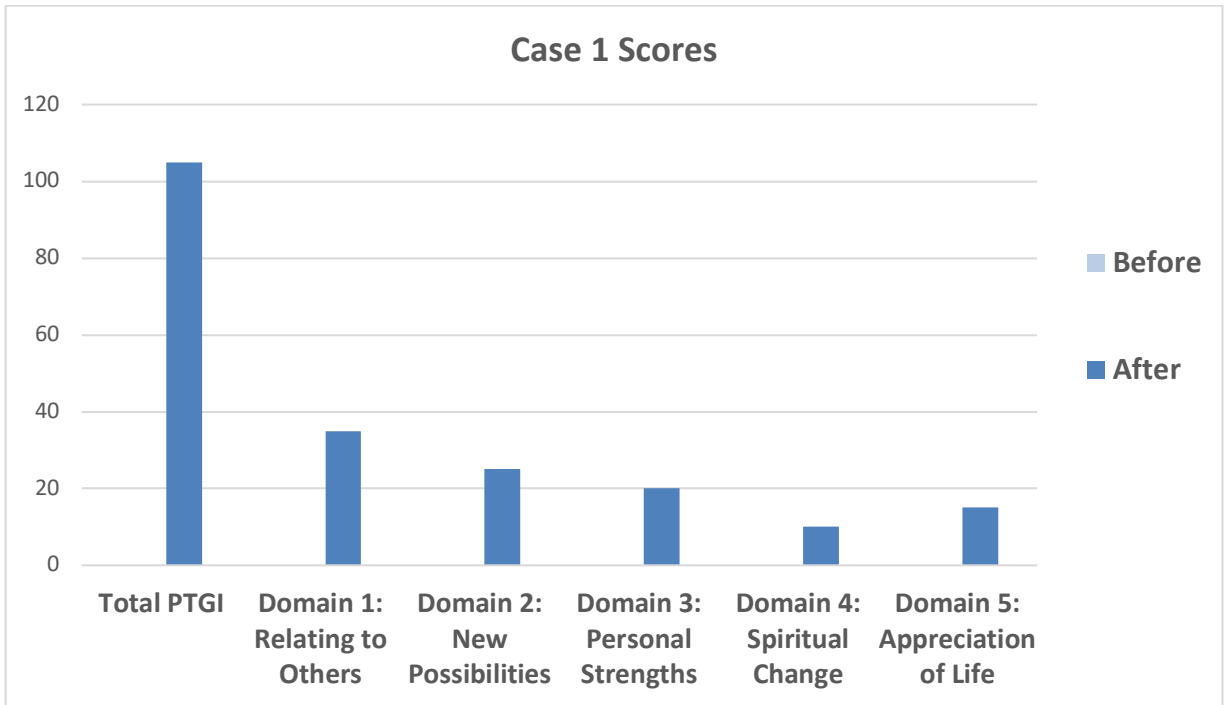
the Personal Strengths Domain, 0 out of 10 to 10 out of 10 in the Spiritual Change Domain, and 0 out of 15 to 15 out of 15 in the Appreciation for Life Domain.

Table 4

Case 1 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	0	105	105	100.00%
Domain 1: Relating to Others	0	35	35	100.00%
Domain 2: New Possibilities	0	25	25	100.00%
Domain 3: Personal Strengths	0	20	20	100.00%
Domain 4: Spiritual Change	0	10	10	100.00%
Domain 5: Appreciation of Life	0	15	15	100.00%

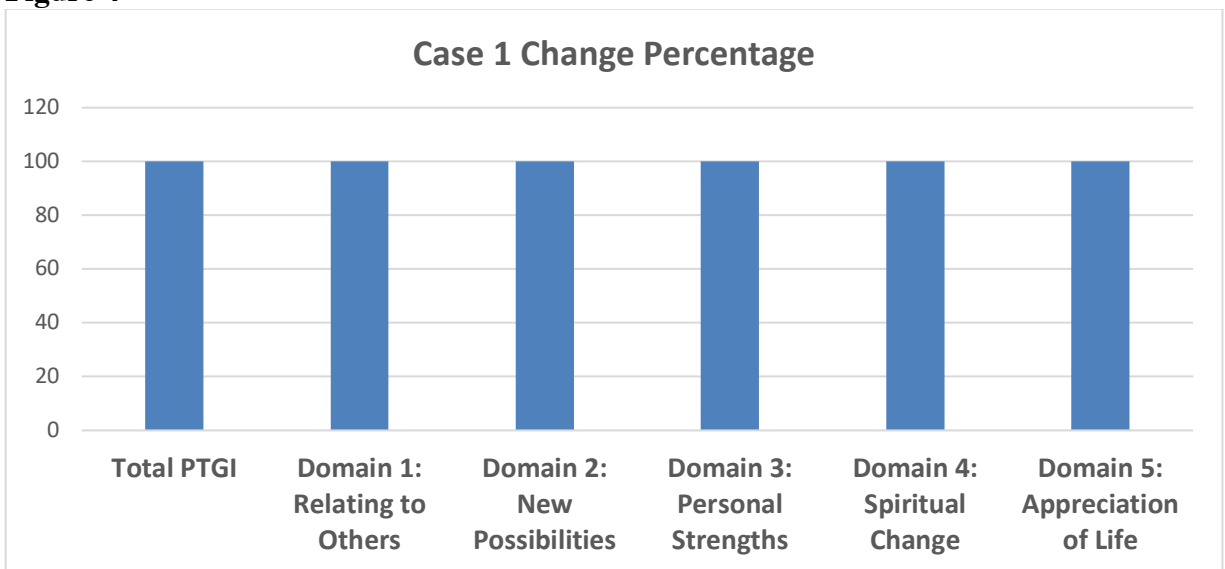
The overall PTGI scores and scores within each domain demonstrated 100% change. This veteran's responses suggest he experienced an increase in growth between before participating in HOW kayak fishing and after.

Figure 3



Note. Figure 3 illustrates the scores in Case Report 1 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 1 scored 0 on the PTGI before their participation in HOW and 105 after his participation.

Figure 4



Note. Figure 4 illustrates the change percentage between the veteran's scores in Case Report 1 before the veteran participated in HOW kayak fishing programs and after.

Case Report 2

The respondent for Case Report 2 is a male Army veteran who fell within the 35-53 years age range. This veteran served in the Army for 1-4 years. They have been connected to HOW for 2-5 years. This individual has participated in HOW kayak fishing events occasionally.

Table 5

Demographics of Analyzed Respondents	
Gender	Male
Age	35-54 years
Race	White
Years participating in HOW	3-5 years
Frequency of participation	Occasionally
Branch of service	Army
Yeats of service	1-4 years

This veteran’s Post-Traumatic Growth Inventory Score (PTGI) before participating in HOW kayak fishing programs was 19 out of 105 possible points. The participant’s PTGI Score after participating in HOW kayak fishing programs was 64 out of 105 possible points. As illustrated in Table 6, the veteran’s responses within each domain also changed: from 7 out of 35 to 21 out of 35 in the Relating to Other domain, 4 out of 25 to 25 out of 25 in the New Possibilities Domain, 8 out of 20 to 20 out of 20 in the Personal Strengths Domain, 0 out of 10 to 10 out of 10 in the Spiritual Change Domain, and 0 out of 15 to 15 out of 15 in the Appreciation for Life Domain.

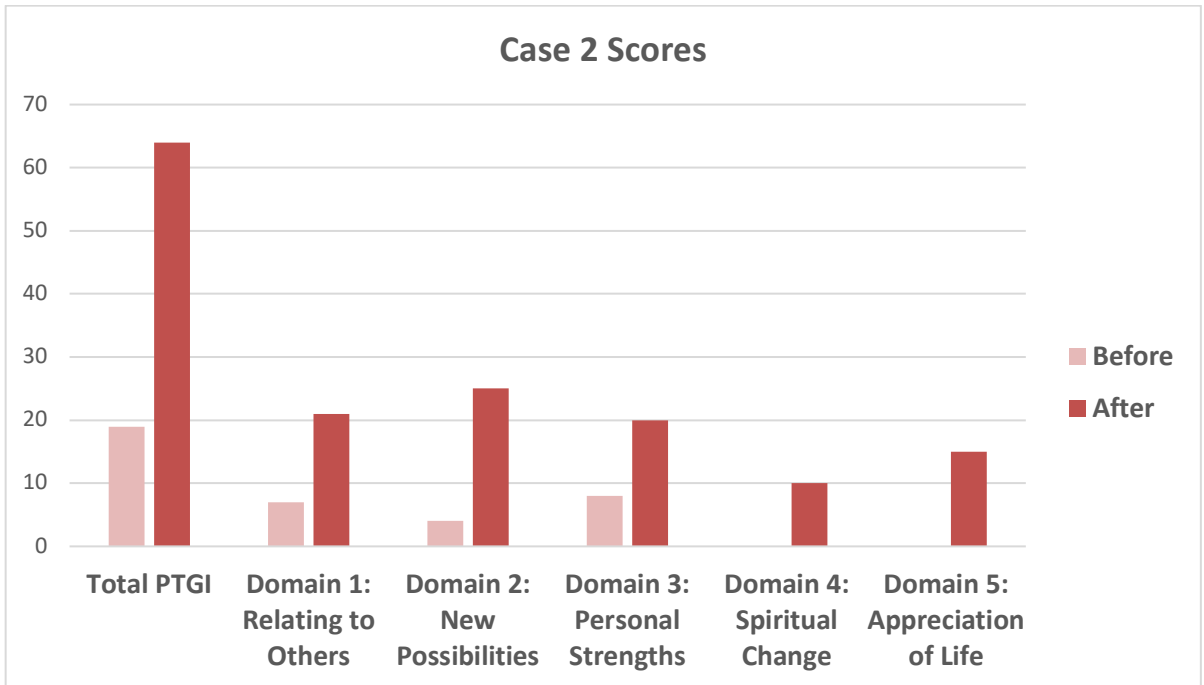
Table 6

Case 2 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	19	64	105	42.86%

Domain 1: Relating to Others	7	21	35	40.00%
Domain 2: New Possibilities	4	25	25	84.00%
Domain 3: Personal Strengths	8	20	20	60.00%
Domain 4: Spiritual Change	0	10	10	100.00%
Domain 5: Appreciation of Life	0	15	15	100.00%

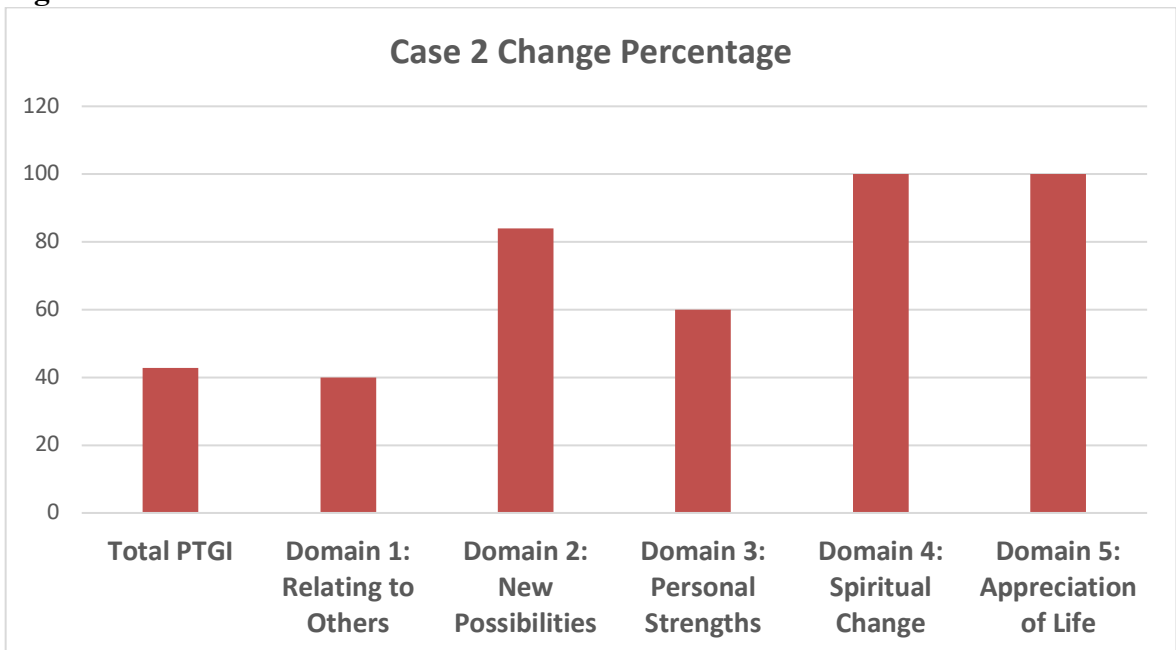
This veteran experienced the largest amount of change within the Spiritual Change and Appreciation for Life Domain, as demonstrated by the 100% increase. He experienced an 84% change in New Possibilities domain and a 60% change in the Personal Strength domain. This veteran experienced the least amount of change, 40%, in the Relating to Others domain. Case 2's responses to the PTCI overall increased by 42.86%. This increase suggests he experienced an increase in post-traumatic growth (PTG) between before participating in HOW kayak fishing and after.

Figure 5



Note. Figure 5 illustrates the scores in Case Report 2 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 2 scored 19 on the PTGI before their participation in HOW and 64 after his participation.

Figure 6



Note. Figure 6 illustrates the change percentage between the veteran's scores in Case Report 2 before the veteran participated in HOW kayak fishing programs and after.

Case Report 3

The respondent for Case Report 3 is a male Marine Corps veteran within the 35-53 years age range. This veteran served in the Marine Corp for 10-14 years. He has been connected to HOW for 3-5 years. This individual has participated in HOW kayak fishing events monthly.

Table 7

Demographics of Analyzed Respondents	
Gender	Male
Age	35-54 years
Race	White
Years participating in HOW	3-5
Frequency of participation	Monthly
Branch of service	Marine Corp
Years of service	10-14 years

Case Report 3’s veteran’s Post-Traumatic Growth Inventory Score (PTGI) before participating in HOW kayak fishing programs was 34 out of 105 possible points. The participant’s PTGI Score after participating in HOW kayak fishing programs was 62 out of 105 possible points. As illustrated in Table 8 the veteran’s responses within each domain also changed: from 8 out of 35 to 35 out of 35 in the Relating to Other domain, 4 out of 25 to 25 out of 25 in the New Possibilities Domain, 7 out of 20 to 20 out of 20 in the Personal Strengths Domain, 7 out of 10 to 10 out of 10 in the Spiritual Change Domain, and 8 out of 15 to 15 out of 15 in the Appreciation for Life Domain.

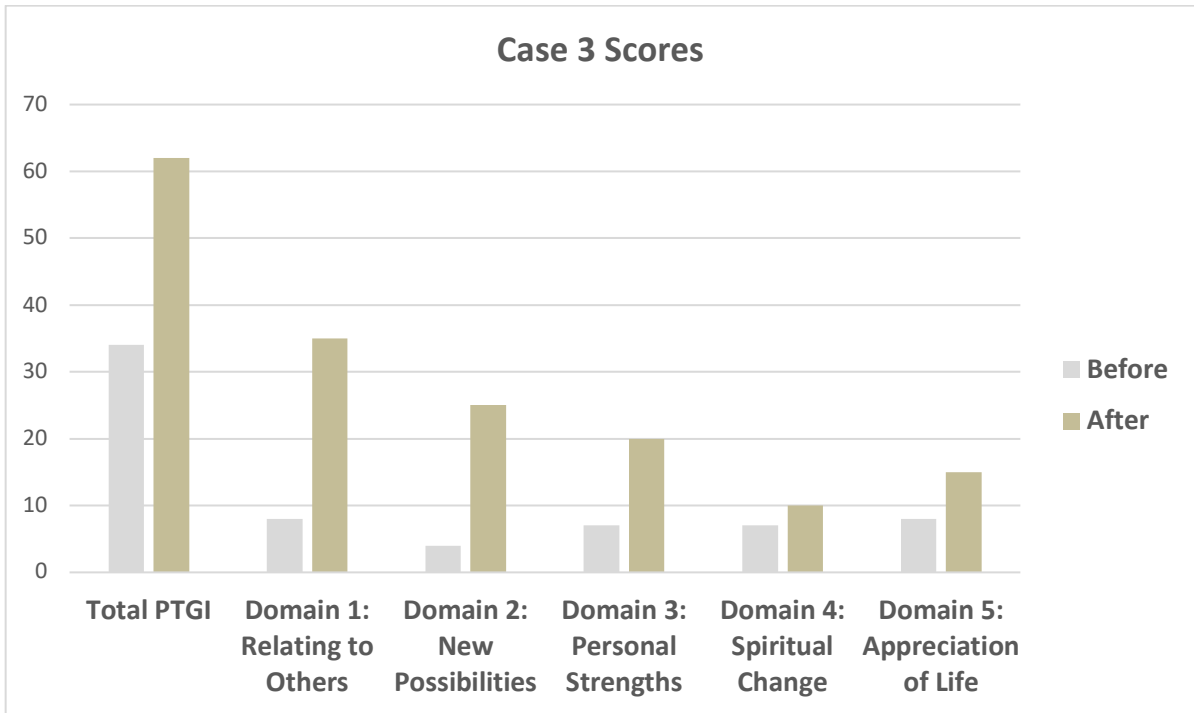
Table 8

Case 3 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	34	62	105	26.67%

Domain 1: Relating to Others	8	35	35	77.14%
Domain 2: New Possibilities	4	25	25	84.00%
Domain 3: Personal Strengths	7	20	20	65.00%
Domain 4: Spiritual Change	7	10	10	30.00%
Domain 5: Appreciation of Life	8	15	15	46.67%

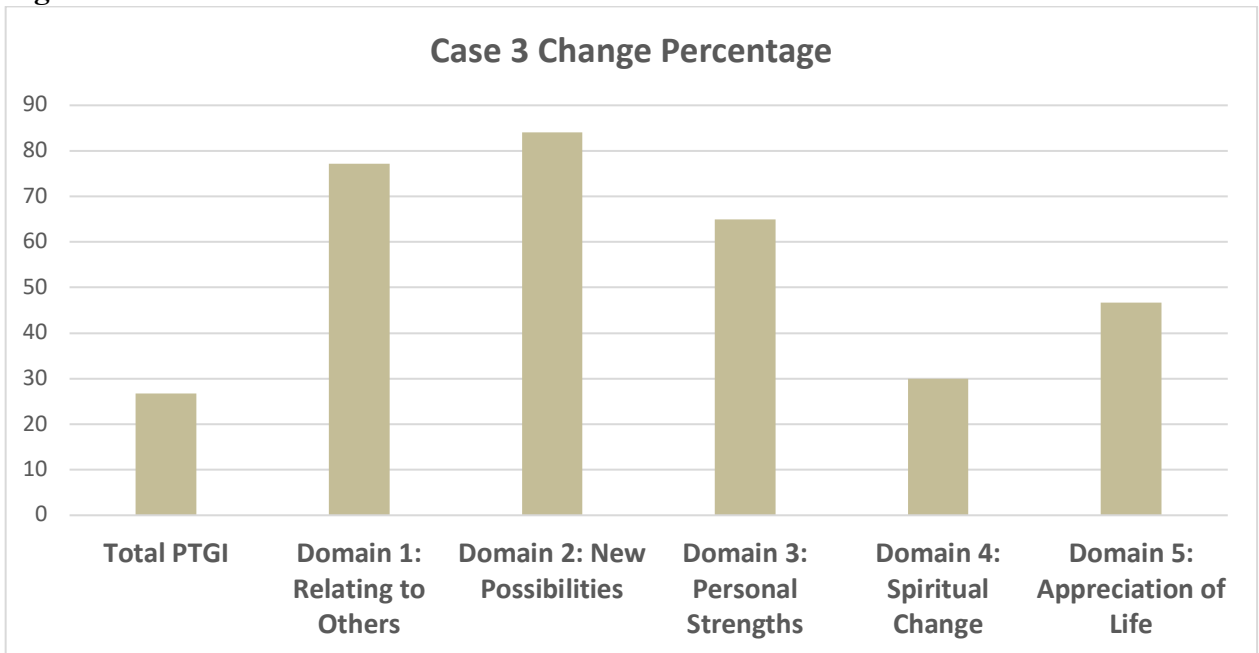
Case Report 3's respondent experienced the largest percentage of change, 84%, within the New Possibilities domain, followed by a 77.14% change in the Relating to Others domain. This veteran experienced a 65% change within the Personal Strengths domain. His lowest percentage of change occurred in the Appreciation of Life domain, which was 46.67% and the Spiritual Change domain which was 30%. His PTGI score overall, changed by 26.67%. This veteran's responses suggest he experienced an increase in growth between before participating in HOW kayak fishing and after but had a smaller percentage of change than the veterans in Case Report 1 and Case Report 2.

Figure 7



Note. Figure 7 illustrates the scores in Case Report 3 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 3 scored 34 on the PTGI before their participation in HOW and 62 after his participation.

Figure 8



Note. Figure 8 illustrates the change percentage between the veteran's scores in Case Report 3 before the veteran participated in HOW kayak fishing programs and after.

CHAPTER V

CONCLUSION

Significance of Study

The purpose of this study was to explore the impact HOW kayak fishing programs have on PTG in military veterans. This study aimed to answer the following research questions:

- How do Post-Traumatic Growth Inventory (PTGI) scores overall differ pre and post engagement in kayak fishing programs?
 - H_0 : Kayak fishing will not have a statistically significant impact on PTGI scores
 - H_1 : Kayak fishing will have a statistically significant impact on PTGI scores
- How do Post-Traumatic Growth Inventory (PTGI) scores within 1 or more domains differ pre and post engagement in kayak fishing programs?
 - H_0 : Kayak fishing will not have a statistically significant impact on PTGI scores within 1 or more domains
 - H_1 : Kayak fishing will have a statistically significant impact on PTGI scores within 1 or more domains

Due to the small sample size, statistical analysis could not be completed, and statistical significance could not be determined. Therefore, this study fails to reject the null hypothesis for each question:

- H₀: Kayak fishing will not have a statistically significant impact on PTGI scores
- H₀: Kayak fishing will not have a statistically significant impact on PTGI scores within 1 or more domains

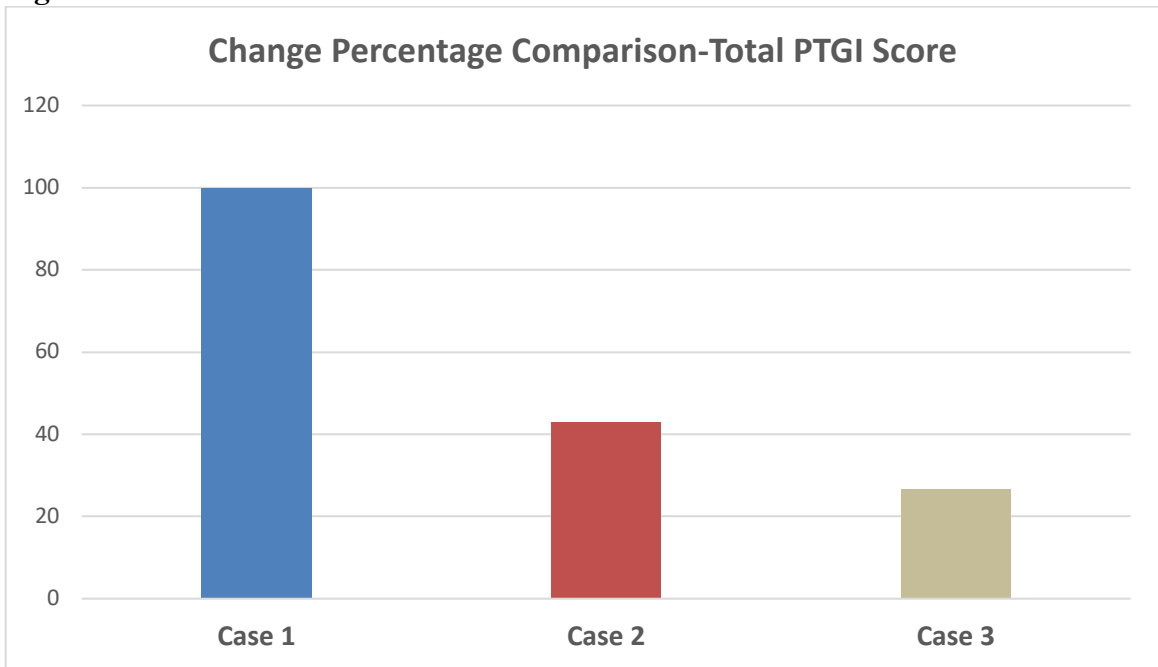
However, the three veterans that completed the survey as intended did provide insight into the posed questions:

- How do Post-Traumatic Growth Inventory (PTGI) scores overall differ pre and post engagement in kayak fishing programs?
- How do Post-Traumatic Growth Inventory (PTGI) scores within 1 or more domains differ pre and post engagement in kayak fishing programs?

The results for Case Reports 1-3 demonstrated an increased in their PTGI scores comparing pre and post engagement in HOW kayak fishing programs. The veteran in Case Report 1 experienced the largest increase in overall PTGI scores by 100%. This was followed by the veteran in Case Report 2 who experienced nearly a 43% change in their overall score. The veteran in Case Report 3 experienced the smallest amount of change of 26.67%. Figure 9 presents the difference in PTGI total scores for each case below.

In addition to the largest percentage of change overall, the veteran in Case Report 1 has also worked for HOW the longest and fell into the highest age range of 65+. The Department of Veterans Affairs (n.d.) reported that Veterans falling within the age range of 65 plus would have served during World War II, the Korean War, the Vietnam War, and Persian Gulf War. In Case Report 1, this veteran may have experienced one of these significant events impacting his response. This information may explain the difference between the scores in Case Reports 2 and 3. Being an older veteran, his experience in the military and access to resources could have made more of an impact than younger veterans. However, further exploration would be necessary to determine the influential factors in the PTGI scores.

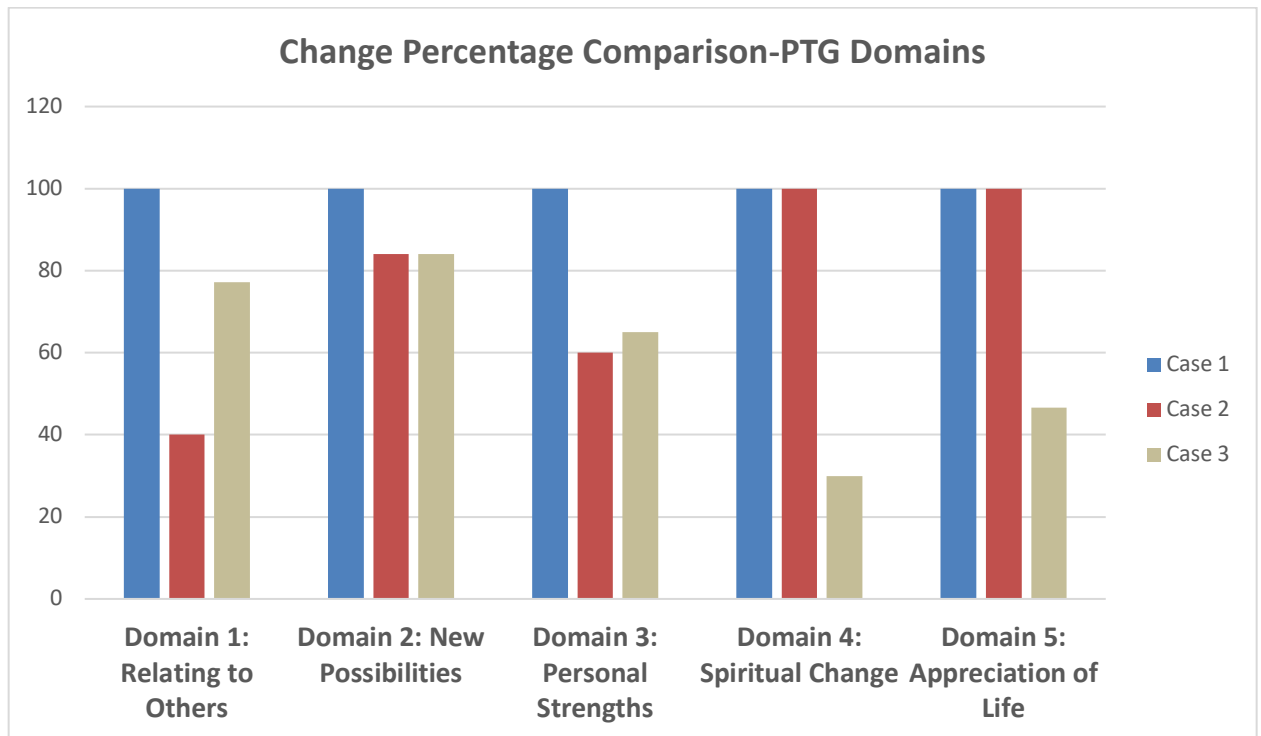
Figure 9



The veterans scores in each case also increased pre and post engagement in HOW kayak fishing programs within 1 or more domains. Figure 10 demonstrates that all 3 veterans experienced a large percent of change in the New Possibilities domain. This change could be related to the veterans' introduction to HOW and possible new connections that resulted from participation.

As illustrated in Figure 10, Case Reports 1 and 2 also demonstrated a greater increase of percentage of change in the Spiritual Change and Appreciation of Life domains compared to Personal Strengths and Relating to Others domains. The percentage change in these domains align with the description Tedeschi, et. al (2018) provided emphasizing the existential changes that may occur and appreciation for nature.

Figure 10



The results are unclear if the veterans' role in HOW-their frequency of participation, their years of service, and race-influenced the change in scores. It is possible, the results were influenced more by the veterans' year of participation in HOW, branch of service, and age. The veteran in Case Report 1 is the oldest, has been connected with HOW the longest, 6-9 years, and experienced the largest amount of change versus participants in Case Reports 2 and 3 who have participated in HOW for 3-5 years and fall within the 35-54 age range.

Case Reports 1 and 2 demonstrated the largest percentage of change and both served in the Army. The veteran in Case Report 3 served in the Marine Corp. The military is recognized to have a unique culture filled with military specific language, dress, behavioral norms, and rituals that promoting cohesion (Meyers et. al, 2017). Though previous research has suggested that Army and the Marine Corps are similar in

hierarchical cultures, Pollman (2018) emphasizes that from boot camp on Marines are believed to be different from the Army.

The Army identified their values as loyalty, duty, respect, selfless service, honor, integrity, and personal courage (*The Army Values*, n.d.; Fort Tours, 2021). Soldiers are expected to demonstrate honor by upholding the other core values. Respect and loyalty are connected to the commitment soldiers make to their country. Integrity and courage to do what's right not matter the physical or moral fear (Fort Tours, 2021). Meyer et. al (2017) report that the Army has promoted a team atmosphere that includes the organization, the individual, and the family. The Army has also housed multiple subcultures based on soldiers' unit, occupation, and rank. These subcultures further emphasize the different experiences that may occur for individual soldiers and different branches (Meyer et. al, 2017).

The Marine Corps values are honor, courage, and respect. Marines are held to the highest standard of honor by demonstrating immense courage and commitment to Corps and Country (Fort Tours, 2021; Moran & Lynch, 2017). The Marine Corps, as an organization, has focused on the outward threats, strives for consistent results and values teamwork at the core (Pollman, 2018). It has been suggested that Marines are closely connected to other Marines. Statements such as, "Once a Marine, always a Marine" and "You're a Marine, or you're nobody." Though Marines respect all individuals that serve, there has tended to be a stronger bond and desire for supporting those within the Corps (Bowen, personal communication, 2022; Fort Tours, 2021). It is possible that the different experiences within these branches influenced the PTGI scores. However, the influential factors of the PTGI scores will require further examination.

The results of this study demonstrated an increase in PTGI scores and suggest that the veterans in Case Reports 1-3 experienced a change in PTG by participating in HOW kayak fishing programs. This study supports Maties and Price-Howard's (2017) claim that HOW programs could be a facilitator of PTG. The results of this study also support current research suggesting that meaningful engagement in recreation could facilitate PTG. As explained in the literature review, meaningful recreation provides space for individuals to explore themselves, develop relationships, and reflect on their lives (Chun & Lee, 2010; Harmon, 2019; Hefferon, et. al, 2008). However, as previous researchers have recommended, continued research is still needed to explore such a phenomenon.

Limitations

The results of this study were limited by the sample size and small number of responses that were completed as intended. Statistical analysis could not be conducted. The impact of demographic information in comparison to PTGI scores were also limited by the sample size. It is possible, the length of the survey was a limitation for individuals that could not complete the PTGI in one setting. The directions, could also have been a limitation, emphasizing a need for clearer, specific instructions that can be easily understood independently. Generalizations cannot be made with the present results, but the results do suggest a change which should be further explored.

Future Directions

Continued exploration into the connection between PTG and RT is encouraged, specifically the impact of HOW kayak fishing on PTG. The field and HOW may benefit from replicating this study but adapting the implementation protocols. For example, offering an option for participants to save their responses. This would require more

caution to maintain participants' anonymity. However, this could assist in managing the length of the PTGI. Another option would be to conduct the PTGI in person. Again, this would require more caution maintaining participants' anonymity, but it would also ensure clarity of expectations of the survey.

Future research may also benefit from an added qualitative data collection component in the form of an open-ended question at the end of a survey or interviews allowing participants to further elaborate on their experiences. Qualitative data may offer insight into influential factors that result in larger or smaller change percentages.

Conclusions

The purpose of this study was to explore the impact HOW kayak fishing programs have on PTG in military veterans. More veterans have turned to community programs and alternative therapies such as recreation and nature-based interventions to assist in treatment and community integration (Davis-Berman et. al, 2018; Hawkins et. al, 2016; Townsend et. al, 2015). Individuals have discovered their abilities, built relationships, found meaning in life, and generated positive emotions through leisure and recreation opportunities (Chun & Lee, 2010). Current research has suggested that PTG can be facilitated through meaningful engagement in recreation and leisure by providing a space for individuals to explore themselves, develop relationships, and reflect on their lives post-trauma (Chun & Lee, 2010; Harmon, 2019; Hefferon, et. al, 2008). Though results of this study were not statistically significant, the results did suggest that HOW kayak fishing programs could influence PTG as evidenced by the change PTGI scores overall and within each domain for the veterans in the provided cases. However, due to varying

increases between the three cases, further research is needed to understand the relationship and determine statistical significance of the relationship.

REFERENCES

- About*. (n.d.). Heroes on the Water. <https://heroesonthewater.org/about/>
- Angel, C. (2016). Resilience, post-traumatic stress, and posttraumatic growth: Veterans and active duty military members' coping trajectories following traumatic event exposure. *Nurse Education Today*, 47 (2016): 57-60.
- Arya, B., & Davidson, C. (2015). Sense of coherence as a predictor of post traumatic growth. *Indian Journal of Health & Wellbeing*, 6(6).
- Austin, D. (2015). The Recreational Therapy Process. *Recreational Therapy: An Introduction (4th ed*, pp 43-61). Sagamore Publishing.
- Austin, D., Crawford, M. E., McCormick, B., & Van Puymbroeck, M. (2016). *Recreational therapy: an introduction*. Sagamore Publishing.
- Bengtsson-Tops, A., & Hansson, L. (2001). The validity of Antonovsky's sense of coherence measure in a sample of schizophrenic patients living in the community. *Journal of Advanced Nursing*, 33(4), 432-438.
- Calhoun, L. G., & Tedeschi, R. G. (2006). The foundations of posttraumatic growth: An expanded framework.

- Cann, A., Calhoun, L.G., Tedeschi, R.G., Taku, K., Vishnevsky, T., Triplett, K.N. & Danhauer, S.C. (2010) A short form of the Posttraumatic Growth Inventory. *Anxiety, Stress, & Coping*, 23:2, 127-137.
- Chen, J., Xiang, X., Lee, J. L. C., Chen, C., He, Y., & Lou, V. W. Q. (2020). Physical activity and posttraumatic growth: A systematic review of quantitative and qualitative studies. *Psychology of Sport and Exercise*, 49, 101679.
- Chun, S., & Lee, Y. (2010). The Role of Leisure in the Experience of Posttraumatic Growth for People with Spinal Cord Injury. *Journal of Leisure Research*, 42(3), 393–415. <https://doi.org/10.1080/00222216.2010.11950211>
- Corolla, P. & Corbin-Burdick, M.F. (2015) Counseling Military Veterans: Advocating for Culturally Competent and Holistic Interventions. *Journal of Mental Health Counseling*. 37(1): 1-14.
- Casey, M. & Householder, M. (2019). Veterans with PTSD, anxiety turn to beekeeping for relief. AP NEWS.
<https://apnews.com/article/69e5ba92366048b9b0e78d9f6b68b14d>
- Das, A., & Singh, I. (2021). How to write a case report?. *Indian dermatology online journal*, 12(5), 683
- Department of Veterans Affairs, V. B. A. (n.d.). *Va.gov: Veterans Affairs*. Elderly Veterans. Retrieved April 21, 2022, from <https://www.benefits.va.gov/persona/veteran-elderly.asp>
- Fort Tours. (2021, March 11). *Core values of different service branches*. Fort Tours-Parents Zone. Retrieved April 25, 2022, from <https://www.forttours.com/at-the-core-by-lela>

- Griffiths, C. A. (2009). Sense of coherence and mental health rehabilitation. *Clinical Rehabilitation, 23*, 72-78.
- Harmon, J. (2019). Tell cancer to take a hike: post traumatic growth on the trail to recovery. *Leisure/Loisir, 43*(4), 459–478.
- Haq, R. U., & Dhammi, I. K. (2017). Effective medical writing: How to write a case report which editors would publish. *Indian journal of orthopaedics, 51*(3), 237.
- Joseph, S. (2011). *What doesn't kill us: The new psychology of posttraumatic growth*. Basic Books.
- Khalil, S., & Mishra, D. (2016). Sharing clinical experience with the scientific community: How to write a case report. *Indian pediatrics, 53*(6), 513-516.
- LaGrange-Aulich, S. (2016). Moral Injury and Posttraumatic Growth Among Combat Soldiers.
- Lee, C., Payne, L. L., & Berdychevsky, L. (2020). The roles of leisure attitudes and self-efficacy on attitudes toward retirement among retirees: a sense of coherence theory approach. *Leisure Sciences, 42*(2), 152-169.
- Little, T. D., Chang, R., Gorrall, B. K., Waggenspack, L., Fukuda, E., Allen, P. J., & Noam, G. G. (2020). The retrospective pretest–posttest design redux: On its validity as an alternative to traditional pretest–posttest measurement. *International Journal of Behavioral Development, 44*(2), 175-183.
- Mark, K. M., Stevelink, S. A. M., Choi, J., & Fear, N. T. (30 October 2018). *Post-traumatic growth in the military: A systematic review*. 12.
- Maynard, C., Batten, A., Liu, C. F., Nelson, K., & Fihn, S. D. (2017). The burden of mental illness among veterans. *Medical Care, 55*(11), 965-969.

- Meyer, E. I., McCarroll, J. E., & Ursano, R. J. (2017). *US Army culture: An introduction for behavioral health researchers*. UNIFORMED SERVICES UNIV OF THE HEALTH SCIENCES BETHESDA MD BETHESDA.
- Mikal-Flynn, J., Anderson, L. S., & Hoffman, J. (2018). Posttraumatic Growth and MetaHabilitation in Recreational Therapy Practice: A Strengths-Based Pathway to Recovery. *Therapeutic Recreation Journal*, 52(3), 269–287.
<https://doi.org/10.18666/trj-2018-v52-i3-8675>
- Moran, D. & Lynch, C. E. (2017). ORGANIZATIONAL CULTURE AND CHANGE: WHAT IMPACT WILL THE UNITED STATES MARINE CORPS' CULTURE HAVE ON THE IMPLEMENTATION OF THE DON'T ASK DON'T TELL REPEAL?. *Public Administration Quarterly*, 254-272.
- Nissen, T., & Wynn, R. (2014). The clinical case report: a review of its merits and limitations. *BMC research notes*, 7(1), 1-7.
- Phoenix Center for Experiential Trauma Therapy. (2019). [Forms of Posttraumatic Growth]. Phoenix Center for Experiential Trauma Therapy.
<https://www.phoenixtraumacenter.com/post-traumatic-growth/>
- Pollman, A. (2018). Framing Marine Corps culture. *Proceedings Magazine*, 2018-06.
- Portney, L. & Watkins, M.P. (2000). *Foundations of Clinical Research: Applications to Practice*. 2nd Ed.
- Rasmussen Reports. (2015). What are the Biggest Challenges Facing Military Veterans?.
https://www.rasmussenreports.com/public_content/politics/general_politics/november_2015/what_are_the_biggest_challenges_facing_military_veterans

- Raidl, M., Johnson, S., Gardiner, K., Denham, M., Spain, K., Lanting, R., ... & Barron, K. (2004). Use retrospective surveys to obtain complete data sets and measure impact in extension programs. *Journal of Extension, 42*(2).
- Shannonhouse, L., Myers, J., & Sweeney, T. (2016). Counseling for Wellness. *The professional counselor's desk reference, 617-623*.
- Skeff, K. M., Stratos, G. A., & Bergen, M. R. (1992). Evaluation of a medical faculty development program: a comparison of traditional pre/post and retrospective pre/post self-assessment ratings. *Evaluation & the Health Professions, 15*(3), 350-366.
- Super, S., Wagemakers, M. A. E., Picavet, H. S. J., Verkooijen, K. T., & Koelen, M. A. (2016). Strengthening sense of coherence: opportunities for theory building in health promotion. *Health promotion international, 31*(4), 869-878.
- Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *How to Choose a Sampling Technique for Research (April 10, 2016)*.
- Tedeschi, R.G. (2011). Posttraumatic Growth in Combat Veterans. *Journal of clinical psychology in medical settings, 18*(2): 137-144.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of traumatic stress, 9*(3), 455-471.
- Tedeschi, R. G., Calhoun, L. G., & Groleau, J. M. (2015). Clinical applications of posttraumatic growth. *Positive psychology in practice: Promoting human flourishing in work, health, education, and everyday life, 2*, 503-518.

- Tedeschi, R.G. & McNelly, R.J. (2011). Can we facilitate posttraumatic growth in combat veterans?. *American Psychologist*, 66(1), 19.
- Tedeschi, R.G., Shakespeare-Finch, J., Taku, K., & Calhoun, L.G. (2018). *Posttraumatic Growth: Theory, Research, and Applications*. Routledge.
- Townsend, J., Hawkins, B. L., Bennett, J. L., Hoffman, J., Martin, T., Sotherden, E., & Bridges, W. (2018). Preliminary long-term health outcomes associated with recreation-based health and wellness programs for injured service members. *Cogent Psychology*, 5(1), 1444330.
- Townsend, J., Hawkins, B., & Bennett, J. (2016). Military Service Members [Review of *Military and Recreational Therapy*]. In *Recreational therapy: an introduction*. Sagamore Publishing. pp.253-277
- Tsai, J., Sippel, L.M., Mota, N., Southwick, S.M., & Pietrzak, R. H. (2015). Longitudinal Course of Posttraumatic Growth Among U.S. Military Veterans: Results from the National Health and Resilience in Veterans Study. *Anxiety & Depression*. 33: 9-18.
- Tsai, J., El-Gabalawy, R., Sledge, W.H., Southwick, S.M., & Pietrzak, R.H. (2014). Post-traumatic growth among veterans in the USA: results from the National Health and Resilience in Veterans Study. *Psychological Medicine*.
- U.S. Department of Veterans Affairs. (2019, October). *Determining Veteran Status*. U.S. Department of Veterans Affairs. <https://www.va.gov/OSDBU/docs/Determining-Veteran-Status.pdf>
- Winston, J. (2021, October 21).

APPENDICES

APPENDIX A

Post Traumatic Growth Inventory

Client Name: _____ Today's Date: _____

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the crisis/disaster, using the following scale.

- 0 = I did not experience this change as a result of my crisis.*
- 1 = I experienced this change to a very small degree as a result of my crisis.*
- 2 = I experienced this change to a small degree as a result of my crisis.*
- 3 = I experienced this change to a moderate degree as a result of my crisis.*
- 4 = I experienced this change to a great degree as a result of my crisis.*
- 5 = I experienced this change to a very great degree as a result of my crisis.*

Possible Areas of Growth and Change	0	1	2	3	4	5
1. I changed my priorities about what is important in life.						
2. I have a greater appreciation for the value of my own life.						
3. I developed new interests.						
4. I have a greater feeling of self-reliance.						
5. I have a better understanding of spiritual matters.						
6. I more clearly see that I can count on people in times of trouble. Text						
7. I established a new path for my life.						
8. I have a greater sense of closeness with others.						
9. I am more willing to express my emotions.						
10. I know better that I can handle difficulties.						
11. I am able to do better things with my life.						
12. I am better able to accept the way things work out.						
13. I can better appreciate each day.						
14. New opportunities are available which wouldn't have been otherwise.						
15. I have more compassion for others.						
16. I put more effort into my relationships.						
17. I am more likely to try to change things which need changing.						
18. I have a stronger religious faith.						
19. I discovered that I'm stronger than I thought I was.						
20. I learned a great deal about how wonderful people are.						
21. I better accept needing others.						

APPENDIX B

6/16/22, 4:15 PM

Oklahoma State University Mail - Approval of Exempt IRB Application IRB-22-100



Jackson, Shelby <sheljac@ostatemail.okstate.edu>

Approval of Exempt IRB Application IRB-22-100

1 message

IRB Office <irb@okstate.edu>

Fri, Mar 4, 2022 at 7:17 PM

To: "Dr. Tim Passmore" <tim.passmore@okstate.edu>, Shelby Jackson <shelby.m.jackson@okstate.edu>

Dear Shelby Jackson,

The Oklahoma State University Institutional Review Board (IRB) has approved the following application:

Application Number: IRB-22-100

PI: Shelby Jackson

Title: The Impact of Heroes on the Water Kayak Fishing Program on Post-Traumatic Growth in U.S. Military Veterans

Review Level: Exempt

You will find a copy of your Approval Letter in IRBManager. Click [IRB - Initial Submission](#) to go directly to the event page. Please click attachments in the upper left of the screen. The approval letter is under "Generated Docs." Stamped recruitment and consent documents can also be found in this location under "Attachments". Only the approved versions of these documents may be used during the conduct of your research.

As Principal Investigator, it is your responsibility to do the following:

- Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted for IRB approval before implementation.
- Submit a request for continuation if the study extends beyond the approval period.
- Report any adverse events to the IRB within 5 days. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
- Notify the IRB office when your research project is complete by submitting a closure form via IRBManager.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB office at 405-744-3377 or irb@okstate.edu.

Best of luck with your research,

Sincerely,

OSU IRB Office

Oklahoma State University
Institutional Review Board
Office of University Research Compliance
223 Scott Hall, Stillwater, OK 74078
Website: <https://irb.okstate.edu/>
Ph: 405-744-3377 | Fax: 405-744-4335 | irb@okstate.edu

APPENDIX C

Figure 1

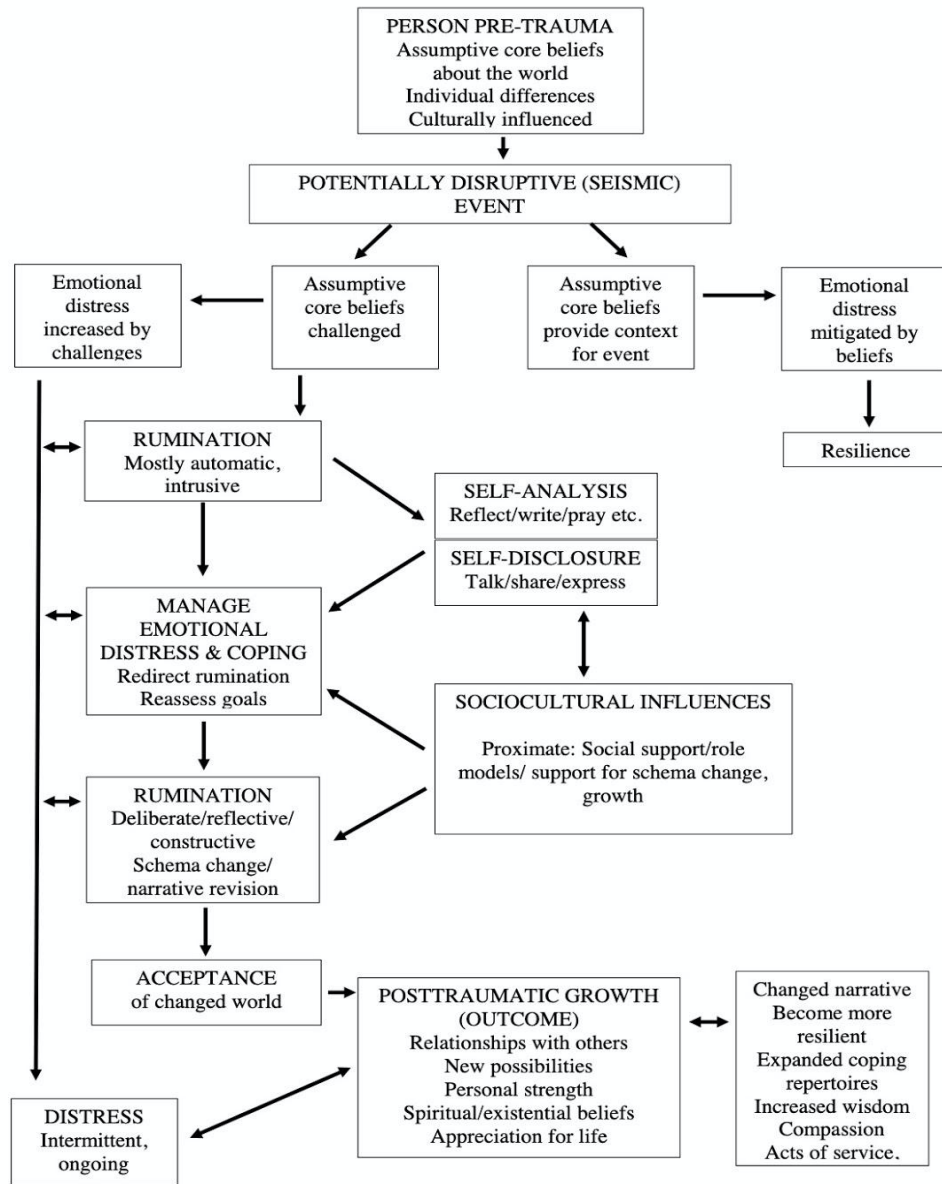


Note. Figure 1 provides a summary of the domains that exist within the PTG theory. These domains are categories for how an individual may demonstrate growth and are further elaborated below (Phoenix Center, 2019).

APPENDIX D

Figure 2

Post-Traumatic Growth Model



Note. Figure 2 is a visual representation of the PTG model. Further elaboration of the model is provided below. From Chapter Title by R.G. Tedeschi, J. Shakespear-Finch, K. Taku, and L.G. Calhoun, 2018, *Posttraumatic Growth: Theory, Research, and Applications* p. . Copyright 2018 by Routledge Publishing.

APPENDIX E

Table 1

PTG Model Components
The person pre-trauma
Seismic traumatic event
Challenges to core beliefs
Intrusive rumination
Managing and coping with emotional distress
Deliberate rumination
Self-disclosure and social support
Post-traumatic growth, narrative development, and wisdom
Enduring distress from trauma

Note. Simplified list of PTG Model components. Listing of components does not mean the model follows as linear process as illustrated in Figure 2 (Tedeschi, et. al, 2018).

APPENDIX F

Case Report 1 Tables and Figures

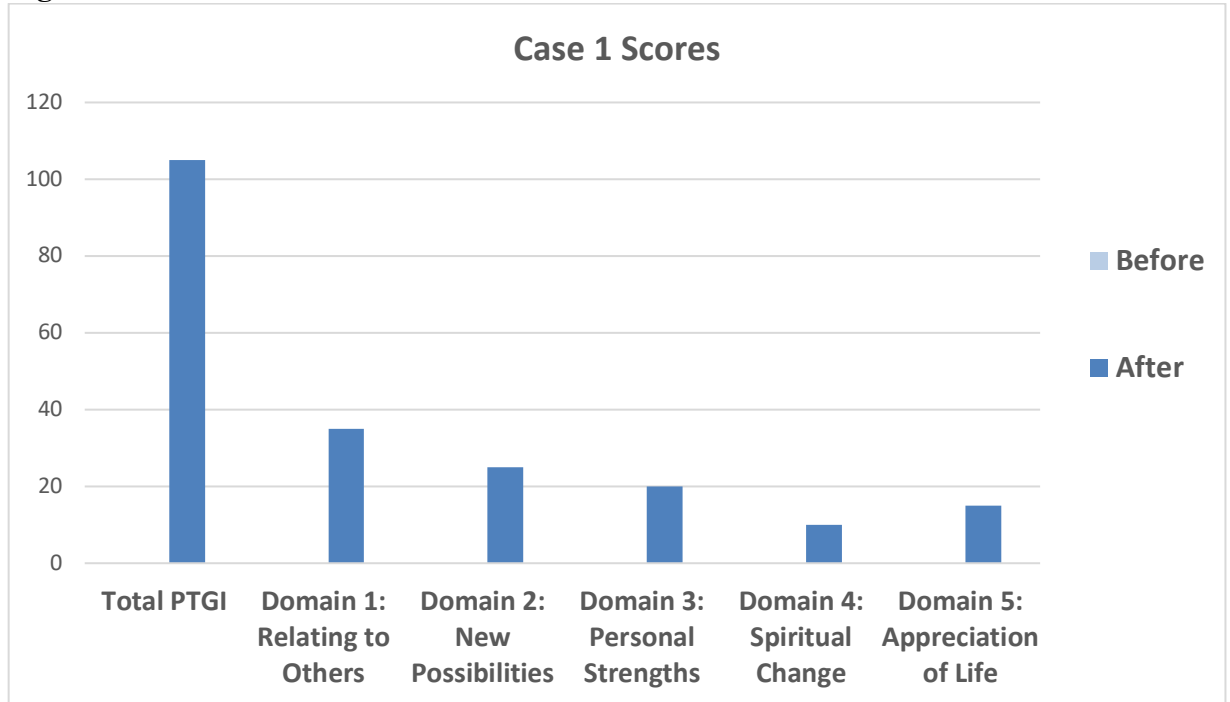
Table 3

Demographics of Analyzed Respondents	
Gender	Male
Age	65+ years
Race	Other
Years participating in HOW	6-9 years
Frequency of participation	Monthly
Branch of service	Army
Yeats of service	5-9 years

Table 4

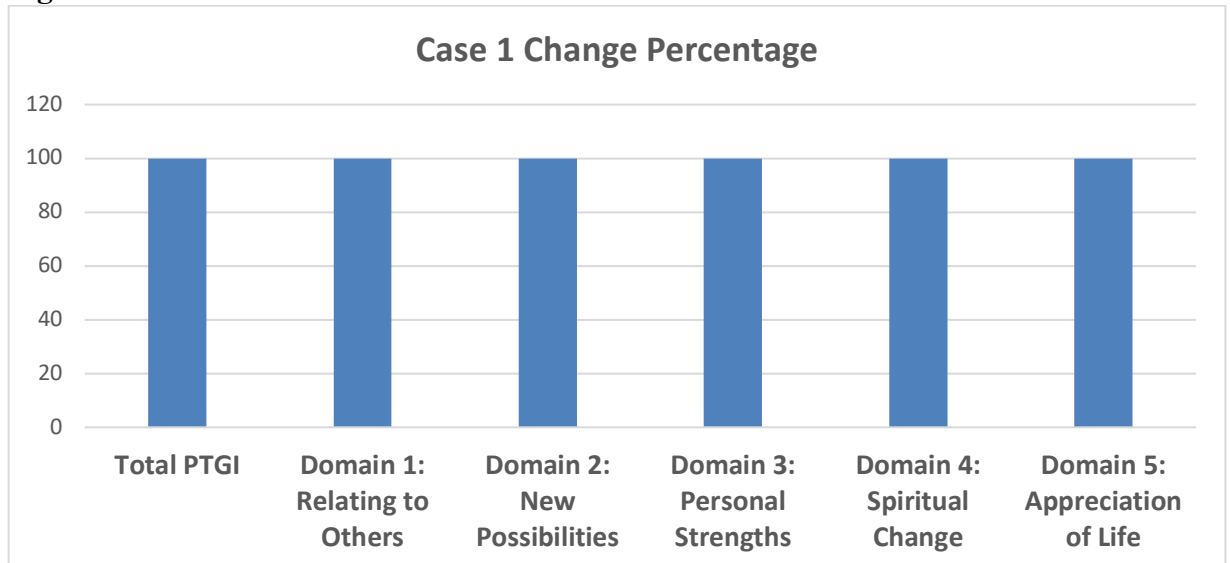
Case 1 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	0	105	105	100.00%
Domain 1: Relating to Others	0	35	35	100.00%
Domain 2: New Possibilities	0	25	25	100.00%
Domain 3: Personal Strengths	0	20	20	100.00%
Domain 4: Spiritual Change	0	10	10	100.00%
Domain 5: Appreciation of Life	0	15	15	100.00%

Figure 3



Note. Figure 3 illustrates the scores in Case Report 1 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 1 scored 0 on the PTGI before their participation in HOW and 105 after his participation.

Figure 4



Note. Figure 4 illustrates the change percentage between the veteran's scores in Case Report 1 before the veteran participated in HOW kayak fishing programs and after.

APPENDIX G

Case Report 2 Tables and Figures

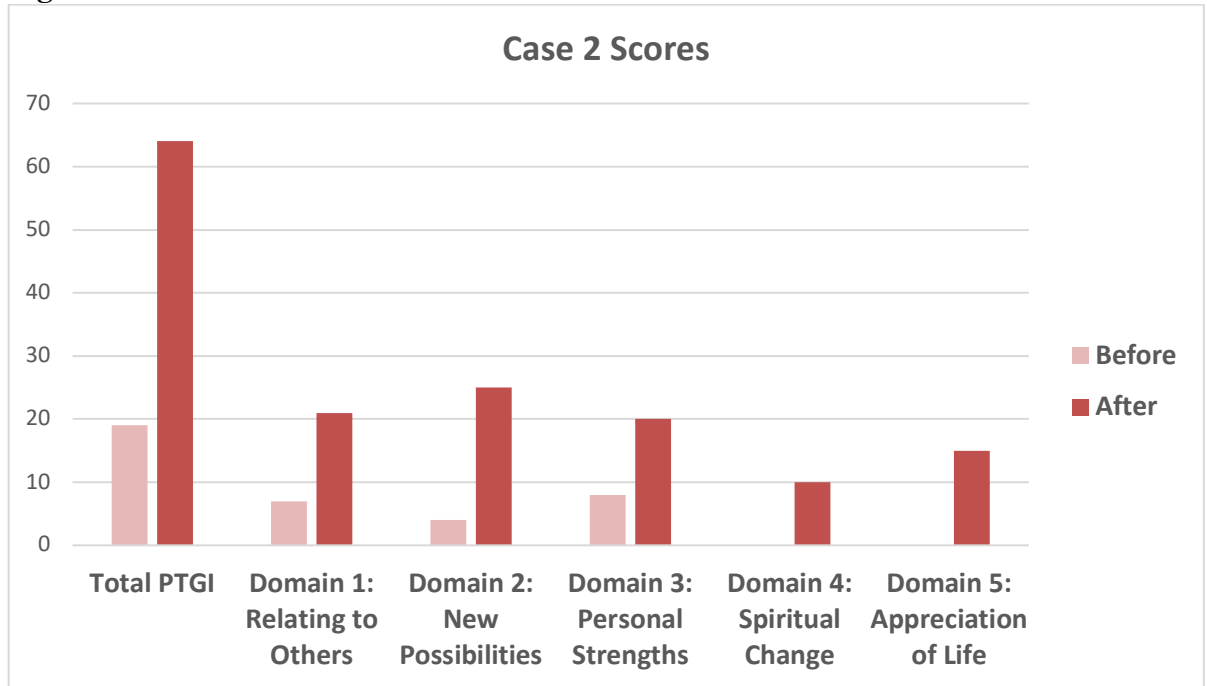
Table 5

Demographics of Analyzed Respondents	
Gender	Male
Age	35-54 years
Race	White
Years participating in HOW	3-5 years
Frequency of participation	Occasionally
Branch of service	Army
Yeats of service	1-4 years

Table 6

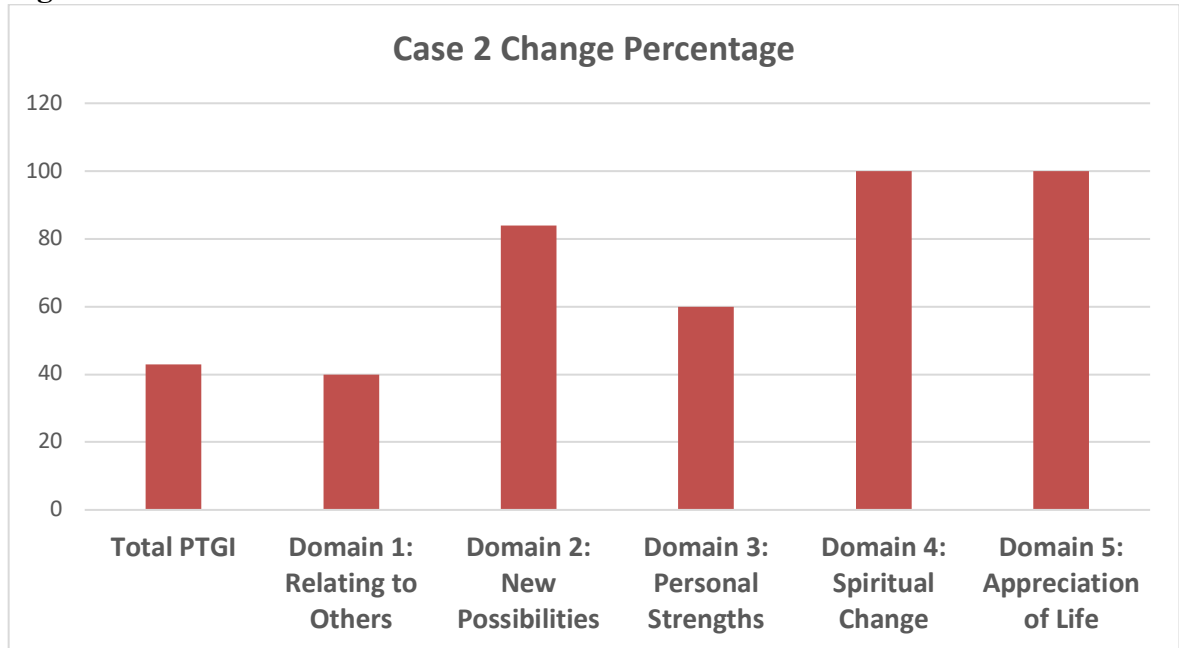
Case 2 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	19	64	105	42.86%
Domain 1: Relating to Others	7	21	35	40.00%
Domain 2: New Possibilities	4	25	25	84.00%
Domain 3: Personal Strengths	8	20	20	60.00%
Domain 4: Spiritual Change	0	10	10	100.00%
Domain 5: Appreciation of Life	0	15	15	100.00%

Figure 5



Note. Figure 5 illustrates the scores in Case Report 2 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 2 scored 19 on the PTGI before their participation in HOW and 64 after his participation.

Figure 6



Note. Figure 6 illustrates the change percentage between the veteran's scores in Case Report 2 before the veteran participated in HOW kayak fishing programs and after.

APPENDIX H

Case Report 3 Tables and Figures

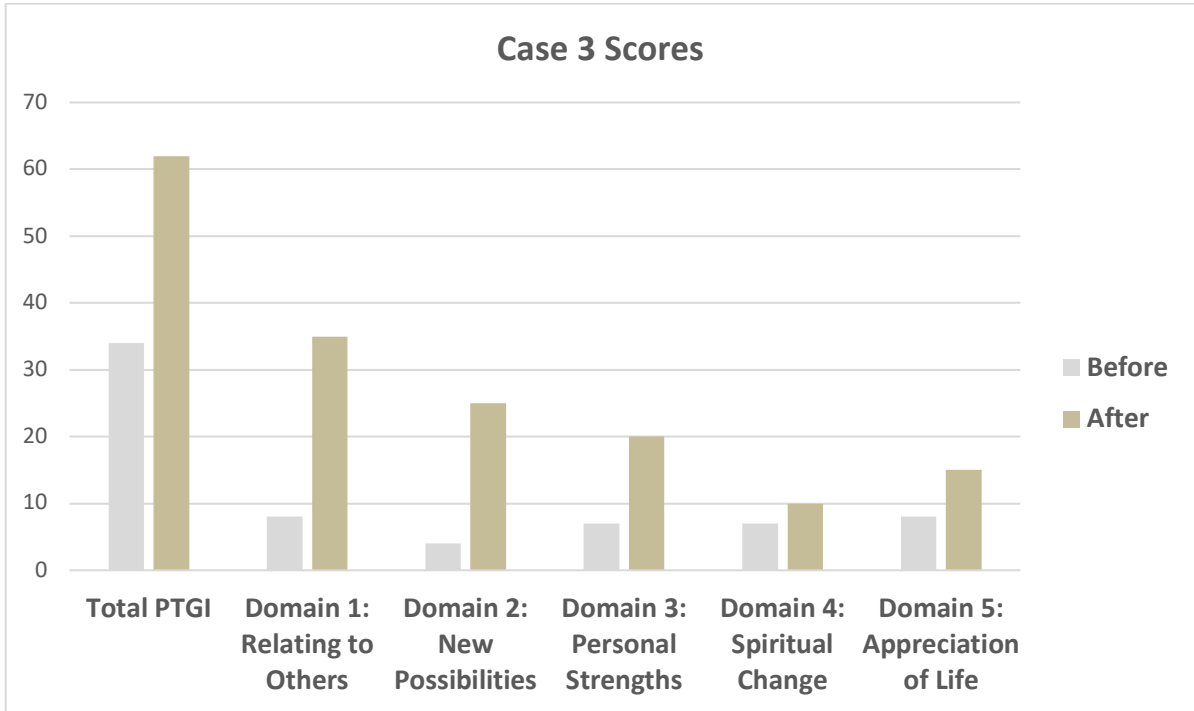
Table 7

Demographics of Analyzed Respondents	
Gender	Male
Age	35-54 years
Race	White
Years participating in HOW	3-5
Frequency of participation	Monthly
Branch of service	Marine Corp
Years of service	10-14 years

Table 8

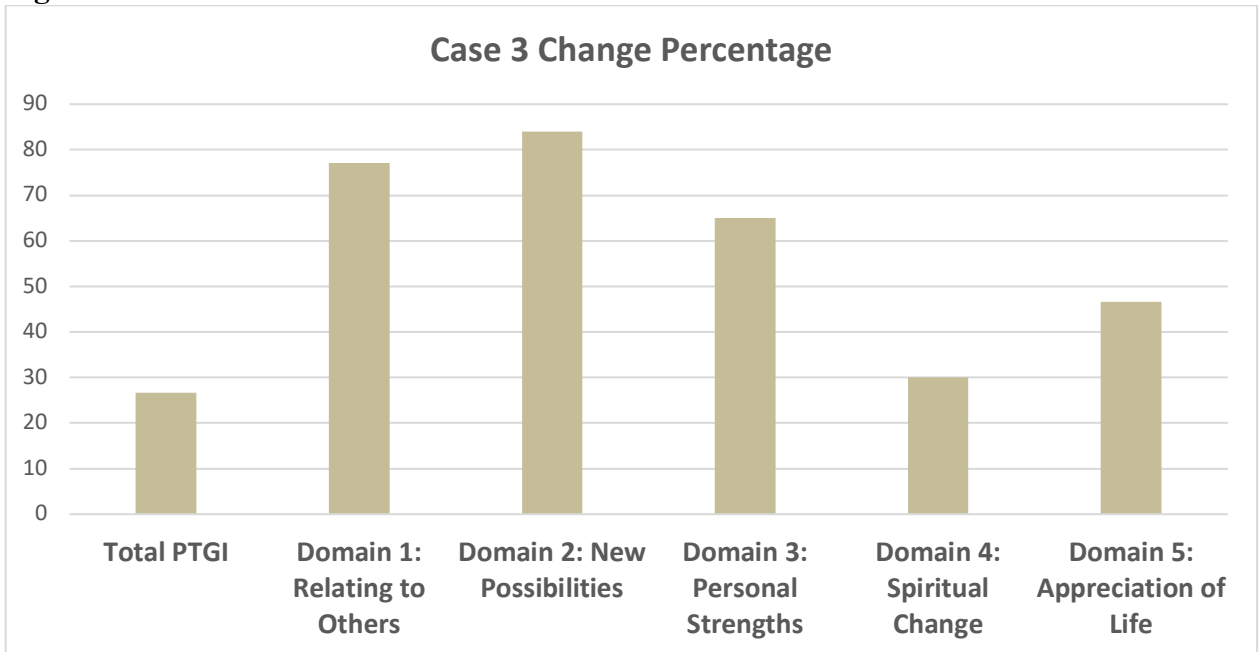
Case 3 Post-Traumatic Growth Inventory (PTGI) Scores				
Item	Before Score	After Score	Max Score	Change Percentage (%)
Total PTGI Before	34	62	105	26.67%
Domain 1: Relating to Others	8	35	35	77.14%
Domain 2: New Possibilities	4	25	25	84.00%
Domain 3: Personal Strengths	7	20	20	65.00%
Domain 4: Spiritual Change	7	10	10	30.00%
Domain 5: Appreciation of Life	8	15	15	46.67%

Figure 7



Note. Figure 7 illustrates the scores in Case Report 3 before the veteran participated in HOW kayak fishing programs and after. The veteran in Case Report 3 scored 34 on the PTGI before their participation in HOW and 62 after his participation.

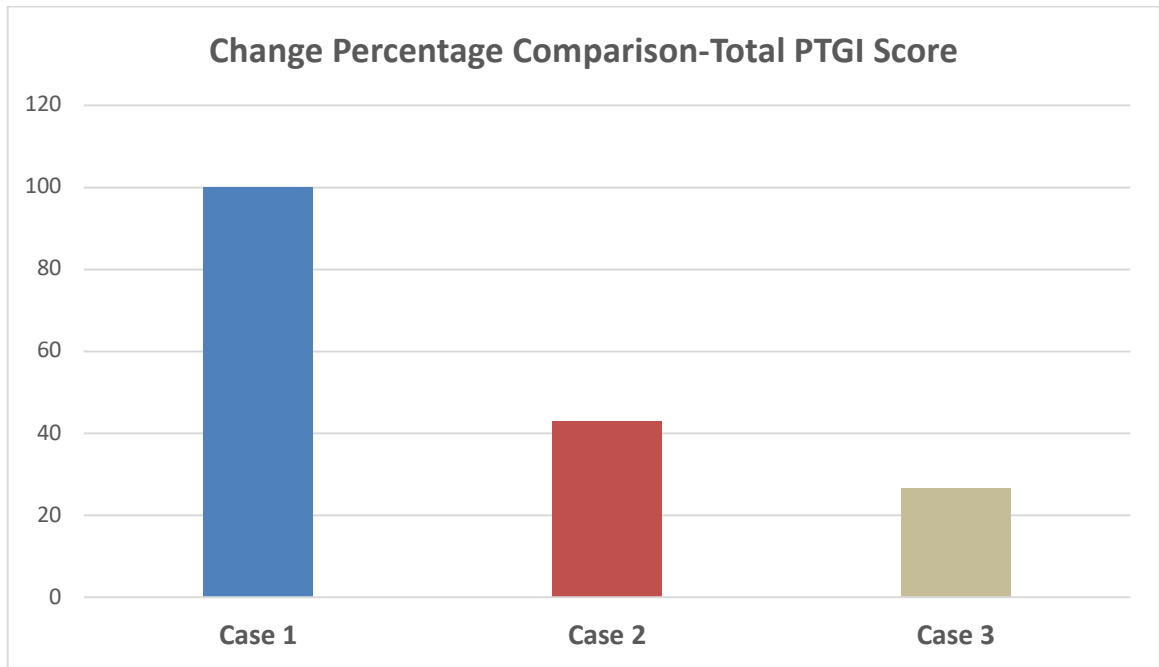
Figure 8



Note. Figure 8 illustrates the change percentage between the veteran's scores in Case Report 3 before the veteran participated in HOW kayak fishing programs and after.

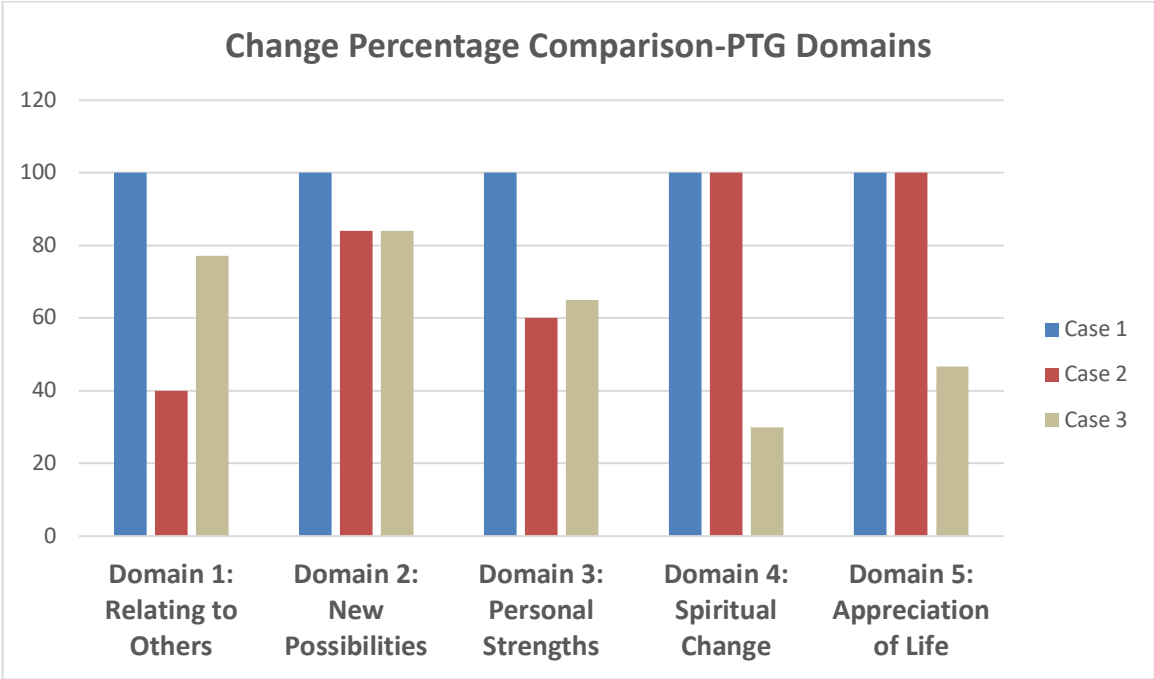
APPENDIX I

Figure 9



APPENDIX J

Figure 10



VITA

Shelby Marie Jackson

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE IMPACT OF HEROES ON THE WATER KAYAK FISHING PROGRAM ON POST-TRAUMATIC GROWTH IN U.S. MILITARY VETERANS: A CASE REPORT

Major Field: Health, Leisure, and Human Performance

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in your major at Oklahoma State University, Stillwater, Oklahoma in July, 2022.

Completed the requirements for the Master of Public Administration at Northeastern University, Boston, Massachusetts in 2019.

Completed the requirements for the Bachelor of Science in Recreation Administration w/ Therapy emphasis at Texas State University, San Marcos, Texas in 2013.

Experience:

Research Coordinator, Heroes on the Water, Allen, TX
January 2022-Present

Graduate Teaching Assistant, Oklahoma State University, Stillwater, OK
August 2019-May 2022

Professional Memberships:

Oklahoma Recreational Therapy Association Spring 2021-Present

American Therapeutic Recreation Association Fall 2019-Present