

A Pilot Study Utilizing Ecotherapy as a Therapeutic Modality  
for Persons with Trauma-Related Stress Disorders

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Abstract

The current research is a sequential mixed-methods pilot study, which focused on the effectiveness of the program called, *Heroes on the Water* (H.O.W.) as a complimentary ecotherapy treatment for individuals in an inpatient co-occurring facility who were suffering with trauma-related stress symptoms. Four-hundred and nine participants completed a pre and post-trip survey, answering questions about symptoms related to stress-related trauma disorders. The reduction in self-reported symptoms were as follows: Stress (56%); Re-experiencing (60%); Avoidance (63%); and Hyper-vigilance (62%). Implications for therapists are discussed and directions for future research. This study contributes to the growing evidenced- based practices of utilizing ecotherapy as an adjunctive treatment method for behavioral health treatment with veterans and other adults.

*Keywords:* trauma, posttraumatic stress, ecotherapy, recreational therapy, therapeutic recreation

**A Pilot Study Utilizing Ecotherapy as a Therapeutic Modality  
for Persons with Trauma-Related Stress Disorders**

Ecopsychology is a field of study that encompasses various treatment models that focus on the natural environment as a source of healing for individuals. Assumptions underlying ecopsychology include: a) modern people living in industrialized nations are more and more disconnected from the natural world, which is an indicator of psychological maladies, such as anxiety, depression, increased stress and interpersonal conflict; b) -reconnection to the natural world, whether plants, animals, gardening, walks in nature can help reduce symptoms of isolation, loneliness, anxiety, and depression (Chalquist, 2009; Cooley, Kurtz, & Robertson, 2020; Roszak, 1992).

Ecotherapy is a general term for various practices and activities that can lead to healing between the human psyche and the natural environment and is an emerging field of ecopsychology that was founded by Theodore Roszak (Fuller, Irvine, Devine-Wright, Warren & Gaston, 2007; Roszak, 1992). Burls (2007) defined ecotherapy as the study of the relationship between the natural environment and human psyche. There are many variations of ecotherapy used as nature-assisted practices and activities which can be therapeutic. (e.g., fishing, kayaking, animal assisted therapy, equine therapy, wilderness therapy, horticultural therapy, green exercise therapy, nature arts and crafts, care farming, adventure therapy) when performed in a systematic manner to develop a

balanced relationship with nature to better one's well-being (Smith, 2015). According to Buzzell and Chalquist (2009) ecotherapy is based on the assumption that humans are bonded to the natural environment the same way they are to their relatives and friends. It is developed from the belief that humans are part of nature and that people's psyches are not separate from the natural environment. For the current study ecotherapy is defined as the application of techniques (i.e., kayaking and fishing) and knowledge (i.e., on post-traumatic stress) as structured in the program, *Heroes on the Water*, to support the process of reconnecting individuals to their natural environment in order to abate psychological maladies stemming from isolation, loneliness, stress, and anxiety.

According to Honeychurch (2016), ecotherapy is a therapeutic intervention where a relationship is created between the client, therapist and nature. Nature can be thought of as the "co-therapist" within this three-way relationship (Hawkins, Townsend & Garst, 2016). This integrative approach focuses on developing or reestablishing a quality relationship with ecology. The primary purpose of the ecotherapy relationship is to promote psychological health, growth, and well-being; as well as to prevent the onset of a mental health disorder and to assist in the healing process of current mental health issues (Honeychurch, 2016).

### **Theoretical Basis of Ecotherapy**

Ecotherapy's basis is established in Attention Restoration Theory (A.R.T.) (Kaplan, 2001). Therapy requires directed attention, not only from the therapist but also from the client. Directed attention is voluntary and requires effort and thus vulnerable to mental fatigue and a reduced ability to focus. A.R.T. is concerned with restoring mental fatigue to recover and replenish its directed attention capacity in order to provide a restorative effect by establishing four essential properties: being away, extent, fascination, and compatibility (Herzog, Maguire, & Nebel, 2003). *Being away* involves a change in location and a distancing from the activities that led to attention fatigue. *Extent* has to do with creating an environmental element where a person feels immersed in a "whole other world" (Kaplan, 1995, p. 173). *Fascination* consists of being in an environment that one finds interesting while capturing their attention effortlessly, thus promoting attention restoration. *Compatibility* refers to a fit with the individual's goals (Felsten, 2009). In other words, they must want to be exposed to and appreciate the environment. A growing body of literature has found that natural settings have been effective in restoring attention and the effects of blue space (e.g., water) has been known to produce salutogenic effects on a person's health (Burls, 2007; Buzzell & Chalquist, 2009; Volker & Kistemann, 2011).

### **Nature's Healing Benefits**

Several studies have shown that regular interaction with the natural world improves an individual's mental and physical wellbeing (Brotherton, 2015; Burls, 2007; Buzzell & Chalquist, 2009; Chalquist, 2009; Kaplan, 2001). Most of these studies have capitalized on investigating people's interaction with various outdoor environments such as remote lands, parks, gardens, open spaces, and urban areas. A consistent finding from these studies has supported that interaction with green environment enhances mental wellbeing and psychological health. It helps individuals to reduce stress-related conditions and improves

their mood. According to Buzzell and Chalquist (2009), interaction with the natural world provided the restorative setting for individuals to relax and unwind their worries.

According to studies, a lack of interaction with the natural environment in urban areas is a common reason people suffer from stress-related conditions, higher crime rates, and abuse of drugs (Brotherton, 2015; Burls, 2007; Buzzell & Chalquist, 2009). Individuals can also experience the side effects of loss of energy, muscle spasms, sleeplessness, restlessness, loss of appetite and dizziness. An alternative treatment is ecotherapy, sometimes referred to as green treatment. According to Burls (2007), interacting with nature is a more effective way of treating and preventing substance abuse and mental illness. According to researchers (Barton & Pretty, 2010; Fuller, Irvine, Devine-Wright, Warren & Gaston, 2007), green exercising protects individuals from type II diabetes, cancer, coronary heart disease, and musculoskeletal disease. It also lowers blood pressure, boosts the immune system and improves blood lipid. Because people are less active in urban environments, this can lead to mental distress that sometimes leads to other health conditions such as heart disease, obesity, and high blood pressure. Chalquist (2009) conducted a meta-analysis on the research evidence of ecotherapy and observed these common themes from the research conducted:

- Disconnection- People are disconnected from the natural world which produces a variety of psychological symptoms including anxiety, frustration, and depression, which are not solely accounted for by intrapsychic or familial dynamics.
- Reconnection- The remedy of reconnecting to the natural world- whether through gardens, animals, nature walks, plants- helps to alleviate these symptoms and induce a greater capacity for health, well-being, self-esteem, social connection, and joy.
- Rekindling- Ecotherapy has the capacity to invigorate an inner aliveness, promoting relationality with self, others, and nature. Ecotherapy techniques work across treatment modalities and can serve as an adjunct to mainline treatments.

Smith (2015) summarized the relationship between individuals and nature's healing role:

- The immersion in a natural setting dissolves the dualisms of mind-body, psyche-spirit, mind-ecology, and self-other.
- The human need for spiritual connection is embedded in human nature and is rekindled in unconscious dialogue with nature.
- Interaction with the natural environment exposes the natural relationship of human existence to the rhythms and cycles of the greater ecological field.
- Mind and ecology merge in a balanced condition when in nature.
- The human ecological unconscious is grounded in our species evolution over thousands of years.
- Indigenous peoples viewed animals and forces of nature as healing agents.
- Animals recover from trauma in natural settings by returning to a state of physical and emotional equilibrium.
- Humans, to recover from trauma, need to be reconnected to their bodies and nature to gain their natural equilibrium.

### **Water's Healing Power**

*"Just being out on the water was the best part." (Study Participant)*

Science shows how being near, in, on, or under water can make you happier, healthier,

and more connected (Nichols, 2014). It is thought that humans have a universal attraction to aquatic hues. Neuroscientists have detected the psychological benefits of water on the human brain while scanning brain activity to see which areas of the brain are being stimulated. Furthermore, the neurological connections formed in our brains since birth are supported by the fact that humans are 78% water, our brains 80% water, the earth's surface is 70% water and over half the planet's oxygen comes from ocean plankton (Nichols, 2014). Another study supported this premise, such as being closer to water (seawater) significantly improved one's well-being (White, Alcock, Wheeler, & Depledge, 2013).

The neuroscience of what Nichol's calls, *Blue-Mind* (the human-water connection), has detected the psychological benefits of water on the human brain while scanning brain activity to see which areas of the brain are being stimulated. He described this state of mind, induced by being in, on, near, or under water (under safe circumstances) as a mildly meditative state characterized by calm, peacefulness unity, and a sense of general well-being in the moment.

An environmental psychologist in the United Kingdom concluded that being closer to water (sea, in this case) significantly improves one's well-being (White et al., 2013). White's data included there are minerals in sea air that reduce stress, negatively charged ions in sea air combat free radicals, support improved alertness and concentration, sounds of waves alter the brain's wave patterns (enhancing relaxation) and salt in water preserves tryptamine, serotonin, and melatonin levels in the brain. Researcher's, Nielsen and Hansen (2007) measured brain activity of participants using a mobile neural cap which taps into brain activity and gave an objective measure of stress in different green environments. They discovered that by showing photographs of a variety of landscapes, stress levels lowered according to how much greenery was in the picture. Then they introduced water in the images, little by little. Participant's showed preference for more and more water in the images due to their brain activity indicated relaxation and pleasure, supporting a profound evolutionary bond between humans and water.

Dr. John Hart, a neurologist at the Center for Brain Health in Dallas, Texas, has worked with H.O.W. participants and offers these insights as to why the program is so effective (Nichols, 2014). First, the program offers a safe and relaxed atmosphere making it easier for participants to trust one another and be vulnerable to opening up about their past experiences. Another benefit of being on the water is that it impacts all five senses and thus allowing participants with PTSD and TBI injury more opportunity to create positive memories and override the bad memories and nightmares. The kayak serves as an effective tool that a participant can become proficient in a brief amount of time. Finally, while on the water, the participant gains a sense of control and restores their self-reliance and efficacy. It is the researcher's belief that the aforementioned studies are one of the primary therapeutic factors that makes a program like H.O.W. effective in the healing of psychological distress.

### **Ecotherapy in Action: Heroes on the Water (H.O.W.)**

*"Going out each week really gave me peace and serenity. It was a good break-up of the monotonous classes. The best part to me was being on the water doing something that I enjoyed in the past but had forgotten about. Definitely, a productive way to relieve stress." (Study Participant)*

Since 2001, more than 2 million U.S. veterans have served in Operation Enduring Freedom (OEF- Afghanistan) and Operation Iraqi Freedom (OIF- Iraq) (Sayer, 2011). According to the Veterans Health Administration (2009), approximately two-fifths of these veterans receive some kind of healthcare and social services through the Department of Veterans Affairs. “Over one-third of veterans returning from deployment have a mental health diagnosis, and many more struggle with challenges of reintegration to family and civilian life” (Snyder & Monson, 2012, p. 301). While not all returning veterans from OIF and OEF have a mental health diagnosis, many experience some kind of adjustment issues as they reintegrate into civilian and family life.

In the current study, the researchers studied the therapeutic effects of an ecotherapy program, *Heroes on the Water* (H.O.W.), and its effect on alleviating the symptoms of trauma-related stress as outlined in the DSM-5 (APA, 2013). *Heroes on the Water* was founded in 2007 and the program’s mission is to “help individuals relax, rehabilitate and reintegrate through kayak fishing and the outdoors” (Dolan, 2007). Since 2007, H.O.W. has served more than forty thousand veterans and over eleven thousand family members to effectively relieve stress-related symptoms of participants (Heroes on the Water, 2019); however, this is the first study to measure the effectiveness on symptom relief of participants since its inception.

By providing adaptive kayaks and equipment as needed, the program empowers individuals to decompress, relax, and reconnect with themselves, others, and to become a part of a community of other participants and mentors, as well as the larger purpose of helping others. *Heroes on the Water* utilizes veterans helping other veterans. One of the aspects that makes this program effective, is that those who participate are encouraged to give back and become team leaders to help others. They do not need to be licensed or certified, they only need to have participated in the H.O.W. program for at least six outings, demonstrate care for the other participants, and be mentored by a senior staff of H.O.W.

*Heroes on the Water* utilizes the activities of kayaking and fishing to provide triple therapy: physical (paddling and fishing), occupational (learning new skills), and mental (relaxation from being on the water) (Dolan, 2007). The *Heroes on the Water* program works by helping veterans interact with other veterans and talking about their trauma as they kayak and fish in a natural environment. Because such a large part of healing in trauma work is reconnecting the individual with others, H.O.W. is promising in its evidence as a catalyst for healing (Buzzell & Chalquist, 2009). The current study explored the effects of ecotherapy, specifically kayaking and fishing in small groups, as an adjunct treatment for individuals in an inpatient substance abuse facility. The researcher’s sought to discover the effects of the *Heroes on the Water* program (ecotherapy) on the symptoms of trauma-related stress.

The researchers chose a sequential mixed method design for this pilot study so as to gain a fuller understanding of the H.O.W. program and a more holistic perspective of the effects of ecotherapy on trauma-related stress symptoms. Pilot studies are an important part of research, to determine whether a research approach is feasible to be used in a larger study (Creswell, 2009). The current study proposed a novel intervention of which there were no previous published assessments on which to base data. For this reason, a pilot study was used to evaluate assessment procedures and implementation of the novel intervention (Leon, Davis, & Kraemer, 2010).

*Heroes on the Water* (H.O.W.) has helped individuals and veterans by reconnecting them with themselves, families, and others to become part of a community to overcome difficulties brought on by the stressors of a military lifestyle, such as multiple deployments, combat, interpersonal stressors, transitioning into civilian life, etc. Through reconnecting and focused relaxing, a process of reintegration begins to occur and rehabilitation follows, by kayak fishing and spending focused time in the outdoors and on the water. Over time, participants tend to find their place in the world and restore a sense of normalcy.

Participants are taught kayaking, kayak fishing basics, and sometimes adaptive kayaks and paddling equipment are required. They spend quality time with other kayaker's and connect with peers that 'get it', and leave behind stresses while communing with nature. H.O.W. offers camaraderie and a social network for veterans and their families. As one study participant noted:

*"The staff did a great job explaining exactly how everything works as far as safety and how to control the kayak and fish. I loved going out on the water and fishing; a weight was lifted from my shoulders and was a good stress reliever. On another positive note, we had military-talk about our experiences and where we will go from here, which allowed us to take a step back and take a good hard look at our lives and what we need to change from negative to positive."*

The following quote summarizes the philosophy of H.O.W. as a program to aid the recovery of those suffering from trauma-related issues.

The way to get feelings out is to *catch and release*. When we used to go fishing, we pulled every fish we caught out of the water and took it home. Then we realized fish were living creatures. We developed a new way to fish called *catch and release*. We caught the fish, then we set the fish free. That's all we need to do with feelings. We can deal with a caught- feeling, then release the feeling and old belief, and life teaches us something new. Then along comes another feeling, emotion, another belief, and a new lesson. It's a natural, organic process called spiritual and emotional growth (Beattie, 2009, p. 231).

*Heroes on the Water* engages with nature and utilizes ecotherapy by employing and focusing on nature and the human-nature relationship (F. Dailey, personal communication, February 1, 2016). "This perspective reveals the critical fact that people are intimately connected with, embedded in, and inseparable from the rest of nature" (Buzzell & Chalquist, 2009, p. 3). The H.O.W. program uses nature to help veterans heal their inner psyche, mental and physical well-being, and any dysfunctional behaviors by reconnecting them with nature and ultimately themselves.

## Method

*Heroes on the Water* utilized a three-phase approach to treatment (Table 1). The three-phase model is in line with other evidenced based models for trauma treatment (Bloom, 1999; Herman, 1992; Schwartz & Prout, 1991; van der Kolk, McFarlane, & Van der Hart, 1996). There are several different treatment modalities used as a part of H.O.W. programs. They offer a) retreats, b) therapeutic recreation programs, and c) local chapters to create communities with whom veterans and their friends and families can belong and participate. Some of the retreats are

titled “*Restarting your Mind,*” “*Facing your Scars,*” and “*Finding a Purpose Filled Life.*” The retreats are taught by outside professionals in their perspective fields. Volunteer chapter teams plan and deliver the monthly kayak fishing excursions for veterans in their communities.

Table 1  
*A comparison of H.O.W. and other trauma-treatment models*

| Model  | Phase 1  | Phase 2  | Phase 3   |
|--|--|--|---|
| Herman (1992)                                  | Developing safety  | Reconstruction of memories   | Reintegration of social connections   |
| Schwartz & Prout (1991)                        | Ego support (reduce symptoms)<br>Normalize abnormal behavior (education)                         | Decrease avoidance (affect, knowledge, behavior)<br>Decrease perceived helplessness (resources to cope with memories)<br>Alter negative/limiting meaning | Decrease avoidance with others.<br>Facilitate integration with self.<br>Facilitate connections with others.                         |
| van der Kolk, McFarlane, & van der Hart (1996) | Education to help understanding what is happening.<br>Identification of feelings through talking | Decreasing avoidance through dissociation of memory.<br>Restructuring trauma-related schemas.  | Reestablishment of social connections.<br>Accumulation of positive emotional experiences.   |
| Bloom (1999)                                   | Developing boundaries of the therapeutic milieu for safety                                       | Reconstruction of memories.<br>Provide structure, diagnose, counteract reenactment of trauma   | Reconnection through community.<br>Importance of play and lightheartedness.   |
| Heroes on the Water (2007)                     | Provide a safe environment and education.<br>Normalization through contact with others.          | Provide structure by fishing groups.<br>Reconstruct memories through talking while fishing and kayaking.   | Reestablish connection with others.<br>Facilitate and build social connections, skills, and self-esteem through outdoor activities. |

The current study is a sequential mixed-methods design pilot study of the effectiveness of one approach to treatment, as administered and utilized by the program, *Heroes on the Water* (H.O.W.). This pilot-study was implemented with a convenient sample of participants who completed the pre and post- trip surveys in order to gain information and to give voice to the lived experiences of the participants, surrounding their trauma-related symptoms and the effect of activities (kayaking and fishing in a small group) on relief of their symptoms. The purpose of selecting a mixed methods design was to maximize the interpretation of findings and to better understand the complex phenomena of trauma-related stress disorders (Creswell, 2013). The research design was a sequential, single-group repeated-measures design (Creswell, 2009; Hill et

al., 2005). With no inferential statistical tests for this pilot study protocol, data were gathered by a brief pre and post trip survey (Appendix 2 and Appendix 3) given to the participants prior to their kayaking and fishing activity and after the activity concluded.

The study was conducted to further support the role of ecotherapy as an alternative or adjunct treatment for individuals who are suffering from trauma-related stress symptoms (Cooley et al., 2020; Dustin, Bricker, Negley, Brownlee, Schwab, & Lundberg, 2016; Roszak, Gomes, & Kanner, 1995). Data were collected in a pre and post-trip survey method utilizing a qualitative method. There was a total of 5 to 6 questions on the surveys using a Likert-style response as well as open-ended questions, over a period of 18 months.

This study looked at the four primary symptoms that correspond with exposure to a traumatic event according to the DSM-5 (APA, 2013). These areas were stress, re-experiencing (nightmares, flashbacks), avoidance (people, places, items that trigger), and hyper-vigilance or arousal (on alert).

### **Researchers**

The researchers background and experience comprise a variation of perspectives and attitudes toward ecotherapy, nature, and its utilization and effectiveness in treatment and recovery. The lead investigator is a professional counselor and educator with prior knowledge and experience of working with individuals who suffer with trauma-related stress disorders. The second investigator is a professional educator in hospitality and tourism with additional certification and experience as a therapeutic recreation specialist. Both have a bias toward the efficacy of using nature and ecotherapy as an adjunct to treatment and restoring mental and emotional health of individuals.

### **Participants**

Of the 700 surveys collected from participants, 409 surveys were completed and usable. Surveys were not used if they were ineligible or a pre-trip survey was not able to be matched with its corresponding post-trip survey. Of the 409 completed surveys, 284 were military (194 male and 90 female) and 125 participants reported a non-military status. The surveys were conducted prior to each outing and immediately following the kayaking and fishing activity (approximately two hours on the water). Special attention was placed on the environment to facilitate the survey delivery, to ensure an informal, non-threatening, and consistent manner for participants to complete the surveys. For a complete demographic breakdown of the participants see Table 2 and Table 3.



Table 2  
*Demographics of participants (N =409)*

|                                  | Male | Female | Total | %     |
|----------------------------------|------|--------|-------|-------|
| <b>Age</b>                       |      |        |       |       |
| <20                              | 14   | 6      | 20    | 5%    |
| 20-30                            | 254  | 84     | 310   | 83%   |
| 31-40                            | 37   | 14     | 48    | 12%   |
| 41-50                            |      |        |       |       |
| Did not disclose                 | 12   | 19     | 31    | 7%    |
| <b>Gender</b>                    |      |        |       |       |
| Female                           |      | 104    | 104   | 25.4% |
| Male                             | 305  |        | 305   | 74.5% |
| <b>Race/Ethnicity</b>            |      |        |       |       |
| Hispanic                         | 21   | 7      | 28    | 7%    |
| Non-Hispanic White               | 275  | 90     | 365   | 89%   |
| Non-Hispanic Black               | 8    |        | 8     | 1%    |
| Did not disclose                 |      |        | 8     | 1%    |
| <b>Branch of Service</b>         |      |        |       |       |
| Air Force                        | 34   | 11     | 45    | 11%   |
| Army                             | 40   | 13     | 53    | 12%   |
| Navy                             | 13   | 11     | 24    | 5%    |
| Marine Corps                     | 10   | 1      | 11    | 2%    |
| Coast Guard                      | 8    | 4      | 12    | 2%    |
| Other, non-serving/family member |      | 2      | 2     | 0.4%  |

Table 3  
*Study participants, combat vs. non-combat experience*

| Totals        | Military Service | Combat Experience | Non-Combat Experience | Non-Military Civilian |
|---------------|------------------|-------------------|-----------------------|-----------------------|
| N=409         | N=284            | n=108             | n=220                 | N=125                 |
| <b>Male</b>   |                  |                   |                       |                       |
| N=305         | n=194            | n=83              | n=140                 | n=111                 |
| <b>Female</b> |                  |                   |                       |                       |
| N=104         | n=90             | n=25              | n=80                  | n=14                  |

Potential participants were contacted in person and asked to volunteer for a brief survey conveying their experience of nature-assisted activities on their symptoms of stress-related trauma. Participants were a convenient sample of persons already admitted to an inpatient facility. The normal rate of stay was twenty-eight days. The facility included a detox facility and individual, as well as group counseling, occurred in the facility. The staff at the facility believed that addiction issues were a disease and accepted the inclusion of physical, behavioral, psychological, social, and spiritual components in treating persons suffering from addiction and other mental disorders.

The treatment center is in the southeastern part of the United States with access to a bay which fed into the Gulf of Mexico. Within a fifty-mile radius of the center are several military installations which make up a segment of the participants of the study. The majority of the participants were male (69%); who had some military service (38%). Civilians (who did not serve in the military) made up 53% of the sample. In order to protect the confidentiality of the participants, who were in an inpatient facility and some of which were veterans, demographic data on the participants was limited to gender, military service, combat experience, and civilian (Tables 2 and 3).

## Measures

Measurements used for this study were a pre-trip survey administered to participants prior to engaging in the nature-based activity and a post-trip survey administered after the participant completed the activity. Each participant was administered the surveys only once during his or her involvement with H.O.W. Guidelines for constructing the survey were as follows: (a) state the problem or need, (b) plan the project, (c) state the research question, (d) review the literature, (e) develop the survey items, (f) construct the survey, (g) conduct the pilot test, and (h) administer the survey (Passmore, Dobbie, Parchman, & Tysinger, 2002). According to Harvard Universities program on survey research, surveys should be developed using a systematic process to enhance the quality of the data (Harrison, 2007). The researchers for this study opted for an interview protocol to administer the survey versus a self-administered survey sent out online or mail to more accurately reflect a greater response rate and fewer incorrectly completed surveys.

The survey developed for this study was a multidimensional scale which measured more than one construct. The survey questions were developed from a review of the literature on stress related trauma as well as the research question for the study. No other measures were found that solicited a mixed method response to the constructs on the pre and post-trip surveys for this study. To construct the pre and post-trip surveys for the current study, the researchers used the Delphi technique to construct, choose, and rate each item until a consensus was reached (Passmore et al, 2002). The group of experts consisted of the researchers, H.O.W. staff members, and H.O.W. chapter leaders, all of whom suffered from documented stress-related disorders and/or disabilities. In addition, several colleagues and H.O.W. staff members were administered the pre and post-trip surveys to complete and were asked to critique and give feedback on the surveys to lend some face validity to the instrument before it was pilot tested with participants in this study.

The pre-trip survey consisted of five questions (Appendix 2) and the post-trip survey (Appendix 3) consisted of six questions, three of which are short answer, in order to measure stress-related trauma symptoms of the participants. The questions focused on describing and rating the participant's trauma-related symptoms. Due to the trauma-related nature of the population being studied, the authors were concerned about losing participants by them spending too much time to complete a lengthier assessment prior to their kayaking experience. It is hoped that the strength of the observed effects of this study will help extend the literature and add to the dialogue of utilizing ecotherapy (i.e., nature-based activities) as a therapeutic modality for treating veterans and other individuals suffering with stress-related disorders.

## **Procedures**

Potential participants were a convenient sample of individuals receiving treatment in an inpatient facility in a southeastern state. Each participant was required to complete an initial screening by a H.O.W. staff member to identify eligibility and a positive trauma history associated with stress-related symptoms. Participants who agreed to participate in the study were required to complete several forms that included: A Memorandum of Agreement (MOA), a Waiver and Release of Liability, a Confidentiality Agreement, and a Media Waiver. In addition, H.O.W. staff (also referred to as event coordinators) were required to review an Event Coordinator Checklist, Event Logistics Guidelines, an Event Safety and Emergency Checklist, and an Accident Report. A flowchart of the H.O.W. hierarchy per event is shown in Appendix 1.

Once a participant agreed to participate in the study and all necessary forms were completed, they participated in the following protocol and activities

### ***The Day of the Event Protocol***

Participants, staff, and volunteers convened to unload the kayaks and prepare their fishing gear. A brief training on kayak safety, paddling, and how to bait and cast a fishing rod was conducted. Then participants were assigned to a cohort of three to five participants and a group leader, thus allowing for personalized attention and maximum verbal processing.

### ***The Group Leader Role***

The group leader of the cohort assisted as needed (such as baiting hooks, etc.) and ensuring the participants had a positive experience. Most of the small group leaders were veterans and had suffered some kind of trauma in their history. They were not trained therapists but paraprofessionals who volunteered their time to participate in the H.O.W. program.

### ***The Planned Activity***

Though there was a planned activity (i.e., kayaking and fishing), the main point was to be out in nature and doing something with other people. Some participants fished, some paddled, some talked, and some did all of these. How the participants performed the activity did not seem as important as where they were doing the activity. The main ingredient was the intentional act of interacting with nature and others. In so doing, nature seemed to yield its healing benefits.

## **Data Collection and Analysis**

Data collection consisted of each participant completing the pre-trip survey prior to embarking on their adventure. Upon returning from the kayaking and fishing trip, the participant was given the post-trip survey to complete. All surveys were collected and secured by the volunteer coordinator for analyzing by the researchers at a later date.

The researchers and the H.O.W. chapter representative employed the CQR methodology to analyze the data and investigate participant experiences (Hill et al., 2005). After the data transcription, each member met three times over a six-month period to cross-analyze the data and achieve consensus. Next, the researchers conducted member checks by emailing an overview of the findings to ensure an accurate representation of their experience (Lincoln & Guba, 1985). Strategies to strengthen the trustworthiness of the study were accomplished by the researchers maintaining continuous awareness of expectations and biases (Hays, Wood, Dahl, & Kirk-

Jenkins, 2016). To triangulate data, all three team members were involved in analyzing and comparing the findings. An external auditor (a professional colleague who teaches research methods course) provided oversight to also increase credibility and confirmability of the findings.

### Results

This study analyzed four areas based upon the categories of symptoms that are typically developed following exposure to a traumatic event. These areas were stress, re-experiencing (nightmares, flashbacks), avoidance (people, places, things that trigger), and hyper-vigilance or arousal (on alert). The results showed that each area had a reduction percentage of over 50%. Within the stress category, there was a reported 56% reduction, re-experiencing was a 60% reduction, avoidance reported a 63% and hyper-vigilance had a 62% reduction (Table 4).

Table 4  
*Participants’ pre and post-trip symptom severity (based on a 5-point Likert scale)*

|                            | Male  |     | Female |     | Pre-trip         |     | Post-trip        |     |
|----------------------------|-------|-----|--------|-----|------------------|-----|------------------|-----|
|                            | n=305 |     | n=104  |     | All participants |     | All participants |     |
| N=409                      | M     | SD  | M      | SD  | M                | SD  | M                | SD  |
| Level of Stress            | 3.8   | 2.8 | 3.2    | 3.0 | 4.2              | 2.9 | 2.0              | 1.8 |
| Re-experiencing (Memories) | 3.0   | 2.6 | 2.8    | 1.7 | 3.1              | 2.2 | 1.2              | 1,9 |
| Avoidance (People, Places) | 4.1   | 1.8 | 3.1    | 2.8 | 4.6              | 3.1 | 2.1              | 1,7 |
| Hypervigilance             | 4.3   | 3.2 | 3.8    | 3.1 | 4.4              | 3.6 | 2.1              | 2.6 |

The qualitative responses helped capture the phenomenological experiences of the participants. One combat veteran shared:

*“I needed to feel like I belonged to something during my recovery. H.O.W. gave me a group of people to belong to. The best part of the experience was getting up with the guys, setting up the kayaks and breaking them down. I think it’s good that we set up and break them down ourselves to give us some responsibility instead of being done for us.”*

Another example by a female participant shared was:

*“You feel part of a family and it makes you talk about your situation without being so stressful.”*

Through analysis of the participant’s surveys, interviewing support staff of H.O.W., and evaluating the H.O.W. program, themes were extracted and clustered through the reduction process (Moustakas, 1994). Following are textual descriptions of the prominently identified phases which emerged. The phases or themes identified were in accordance with other, evidenced-based, models to effectively treat individual's suffering with trauma-related symptoms. Examination of the participants' experiences, in their own words, also are extrapolated from the data.

The prominent themes which were identified could be adapted as phases for treatment, and they are:

1. *Phase 1*: H.O.W. provided a safe environment, educational experience, and normalization of symptoms;
2. *Phase 2*: H.O.W. provided structure through activities and a chance for participants to talk about their experiences, to reconstruct memories, and;
3. *Phase 3*: H.O.W. reestablished connections with other individuals through a planned activity and the experience of learning something new, to help one's self-esteem.

Though predicted, the researchers also wanted to discover if the H.O.W. program fulfilled the principles of evidenced-based treatment for trauma currently available. Unbeknownst to the founders, who created this program in 2007, the nature-based activities of the H.O.W. program do measure up to current literature on trauma treatment as outlined in Table 1.

### Discussion

The purpose of this study was to explore the therapeutic effects of the ecotherapy program, *Heroes on the Water* (H.O.W.), and the effect of participation in the program on the reduction of trauma-related stress symptoms of the participants. The data indicated that the *Heroes on the Water* program was effective in reducing symptoms associated with trauma-related stress and could be used to augment traditional therapy practices. The qualitative data enhanced the interpretation of the findings by depicting the participant's depth of experience while participating in the H.O.W. program. The *Heroes on the Water* program was also found to be similar to other evidenced-based, phase-oriented trauma models (Table 1).

While more research needs to be done on H.O.W. and other ecotherapy programs to demonstrate their effectiveness for trauma-related symptoms, the act of participating in a structured and intentional nature activity, such as kayaking and fishing, significantly assisted in the reduction of stress, re-experiencing intrusive memories and flashbacks, avoidance and isolating behaviors, and hypervigilance among participants. The unique stresses of urban living, deployment, and combat-related issues for military individuals and their families leave their mark in the way of symptoms, disorders, interpersonal struggles, and displacement.

Most treatments for trauma-related symptoms are done by utilizing psychotherapy, medications, group therapy, and other forms of treatment modalities that may serve as adjuncts for healing symptoms. A combination of these methods of treatment can also be employed in treatment regimens for various psychological disorders. Military veterans obtain medical care from select medical centers that take care of their physical and mental health services, however, many of these medical centers have long waiting times and inadequate service personnel to deal with the large numbers of veterans that require help. Best practices would necessitate complementary approaches, such as ecotherapy, for the treatment of the whole person, and may include ecotherapy as an adjunct to other treatment methods (Cooley et al., 2020; Selhub & Logan, 2012).

There are a number of contributing factors that can make an individual more vulnerable to trauma-related stress disorders. Having less social support or a history of previous traumas, mental health issues, or substance abuse, and even genetic factors. Therefore, treatment for

trauma-related disorders requires a holistic approach for the individual. For optimum efficacy, treatment will include a *psychological* component to assist the individual in creating a narrative of his or her trauma; a *spiritual* component to assist the individual in the teleology of creating meaning of the trauma; a *biological* component to aid the individual in self-care, nutrient supplementation, and medications to treat other comorbid issues; and finally an *interpersonal* component to assist the individual in reestablishing vital connections for support (Hermann, 1992; Van der Kolk, 2015). *Heroes on the Water* is complimentary with other phase-oriented approaches to effectively relieve trauma-related symptoms, thus demonstrating the ability to reduce trauma-related stress, increase coping skills, reestablish social connections, and accumulate positive emotional experiences.

A pilot study makes good clinical practice in research to further a concept and prepare the way for future research in an area. The researchers deemed this important in contributing to the profession of counseling on the topic of ecotherapy. In addition, a pilot study is a requisite initial step to exploring a novel intervention, such as the *Heroes on the Water* treatment model. Furthermore, by conducting a pilot study, it can provide enough data for researchers to decide whether to proceed with subsequent studies (Passmore, et al, 2002).

Ecotherapy can be a viable option for consideration as a primary or supplemental source of healing and recovery for individuals, by offering therapists from various professions options to expand treatments while assisting other's well-being.

### **Limitations and Future Research**

Ecotherapy is a young field and current approaches to the study of it lack theory and research. The need to develop a clearer set of criteria for defining ecotherapy is needed, which the authors attempted to support with this research study. One common limitation is the mysterious benefits nature has on the individual through reconnection with and saturation in a natural setting and just how this occurs. Limitations of the current study were the pre and post-trip surveys. Self-report measures are susceptible to multiple erroneous factors that may influence the way a participant answers a question. For this reason, caution should be used in generalizing the results to other populations. Another limitation was that the participants were already in an inpatient treatment facility, obtaining individual and group therapy. For this reason, it was difficult to determine the exclusive effectiveness of the *Heroes on the Water* program on symptom reprieve versus other forms of traditional therapy. However, as an adjunct treatment, ecotherapy (i.e., *Heroes on the Water*) for these participants yielded positive treatment effects. Future research may include having a control group as a baseline to compare and assess the effect of the H.O.W. program versus other forms of complementary and traditional treatment methods. Because the current study was a convenience sample and mixed with military and nonmilitary participants, additional research could be established to control for these variances amongst the participants, by studying a more homogenous target population.

Limitations to practicing ecotherapy include a significant time commitment for structured outdoor activities; cost of necessary equipment; certain boundaries because it is an out of office experience; the challenge of confidentiality; and inadequate access to nature (Clare, 2014). Therapists should be aware of professional and state ethical codes for doing therapy outside of an

office setting, as well as to the risk involved in performing activities in an outdoor space. Clearly, there are many determinants that will dictate whether ecotherapy is even an option with some clients.

### Conclusion

Many veterans report suffering from stress-related symptoms and admit to the difficulties and challenges they face when reintegrating into civilian life and seeking mental health treatment. Traditional therapies such as evidenced-based interventions and medication management are used primarily for treatment; however, there is value in creating additional support for veterans outside of traditional therapy to support their mental health. *Heroes on the Water* recognizes the positive impact of ecotherapy and the beneficial effects of engaging with nature for one's psychological well-being. For many veterans, not all of the provided services are adequate in treating mental health issues, therefore, nature-based ecotherapy treatment approaches can be a supplementary service to address the needs of those who seek additional support beyond psychotherapy and medication. It is hoped that the current pilot study will encourage future research on ecotherapeutic programs to contribute toward establishing an evidenced-based therapy.

*Heroes on the Water* can be a viable alternative or supplement to traditional therapies. From this study, several prominent themes were identified that the H.O.W. program offered. They include, providing a safe environment to promote openness and trust among participants; by providing a structured environment in nature to assist veterans in reconstructing memories through group activities, and; by facilitating the reestablishment of connecting with others. In the literature on treating trauma, these are found to be protective factors against developing mental illness such as depression and PTSD, as well as comorbid disorders such as substance abuse (Kaplan, 1995). Many veterans also described how belonging to H.O.W. provided them with purpose through leadership opportunities, volunteering, and a chance to help others with the tasks associated with kayaking and fishing. The H.O.W. program focuses on providing purpose to veterans through opportunities to take responsibility, and to help others while they help themselves.

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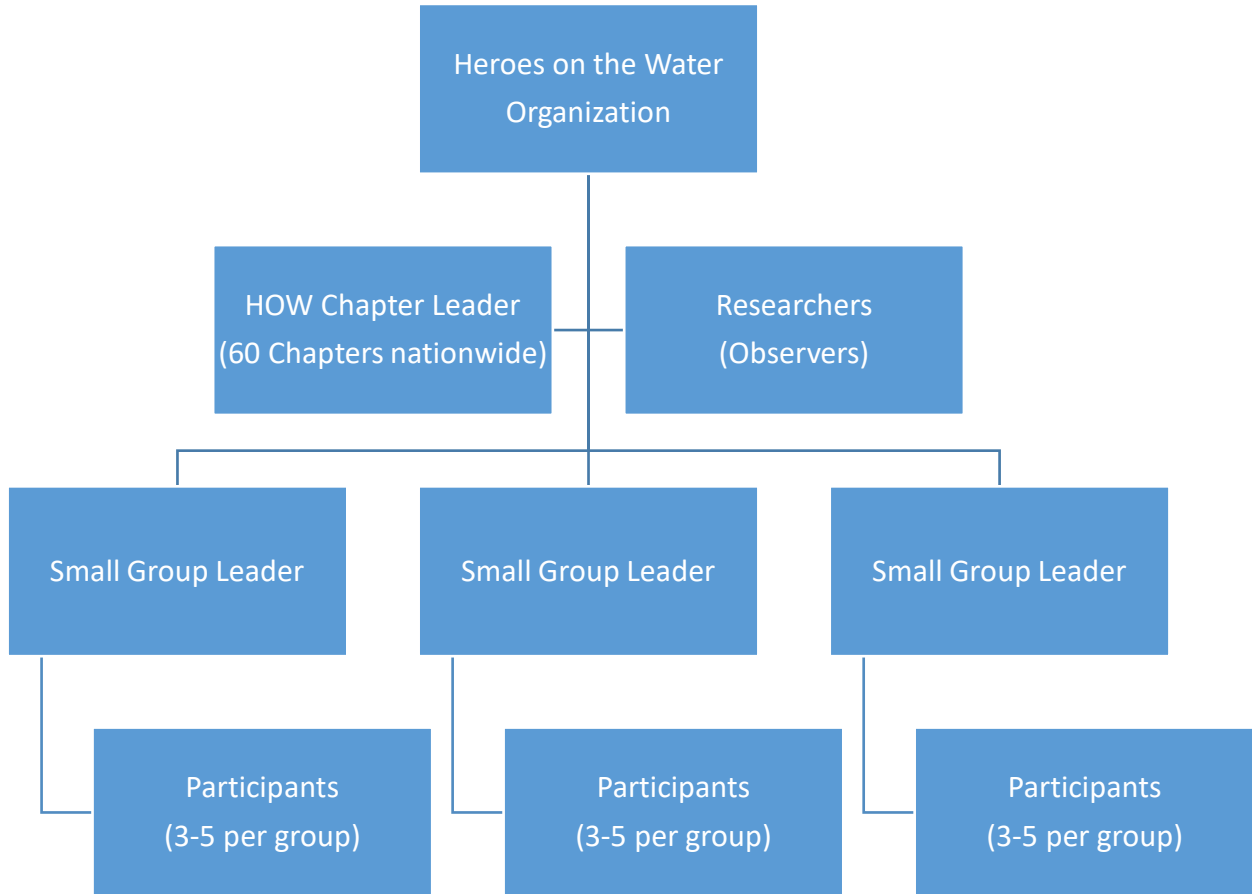
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**Appendix 1**



## Appendix 2

The pre-trip survey consists of five questions with sub-questions (H.O.W., 2013)



Pre-Trip Survey Name \_\_\_\_\_

**1. Please describe your military or service type. (Check all that apply)**

- Active Duty Service member who has deployed in combat
- Retired Military Service Member with combat experience during service
- Medically Retired Service Member
- Veteran who experienced combat but was not retired medically
- Veteran who completed an enlistment or service commitment
- Other

**2. What Branch of Service?**

\_\_\_\_\_

**3. Have you participated in program with Red before?**

- No     Yes

**4. How would you describe your level of daily stress?**

|                                       | High                     | Medium                   | Average                  | Low                      | None                     |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| At Work                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| At Home                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Physical Stress due to injury/illness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Current stress level                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**5. Looking at the following symptoms of traumatic Stress Reactions, please rate the intensity of your symptoms.**

|   | High                     | Medium                   | Average                  | Low                      | None                     |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Re-experiencing (nightmares, flashbacks, ect)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoidance (people, places, things that trigger) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hypervigilance (on alert)                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### Appendix 3

The post-trip survey consists of six questions with sub-questions (H.O.W., 2013)



#### Post-Trip Survey

1. How would you describe your stress level following your HOW Event?

(Please circle your response)      High      Medium      Average      Low      None

2. Would you like to continue to participate in further HOW events?

- No thank you
- Yes: Local Monthly Events
- Yes: Local Multiple Day Event
- Yes: Regional Area Multi-day Event with other HOW Events

3. Please rate the intensity of your symptoms after the event.

|   | High                     | Medium                   | Average                  | Low                      | None                     |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Re-experiencing (nightmares, flashbacks, ect)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoidance (people, places, things that trigger) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hypervigilance (on alert)                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Were your needs met by the HOW team? (please explain what was done and what could have been done better to support you)

5. What was the best part of your experience and what could have been done better.

6. Please provide any additional information you would like to share!