The Role of Horticultural Therapy in the Treatment of Refugees with Post-traumatic Stress Disorder

Molly Nadeau

A Senior Thesis submitted in partial fulfillment
of the requirements for graduation
in the Honors Program
Liberty University
Spring 2019

Acceptance of Senior Honors Thesis

This Senior Honors Thesis is accepted in partial fulfillment of the requirements for graduation from the Honors Program of Liberty University.

_____

Robyn Anderson, Ph.D.
Thesis Chair

_____

Annette Florence, DrPH
Committee Member

_____

William Scott, Ed.D.
Committee Member

_____

Cindy Goodrich, Ed.D., RN
Assistant Honors Director

_____

Date

Table of Contents

Abstract

The United Nations High Commissioner for Refugees (UNHCR) cites that there are an unprecedented number of refugees. As of 2017, over 68.5 million people have been forcibly displaced from their homes, with 25.4 million of this group being classified as refugees (United Nations High Commissioner for Refugees, 2018). Often, mental health issues arise from the trauma that they face. Recently, the use of horticultural therapy, which uses gardening and plant-based activities as a form of treatment, has shown mental health improvements in military veterans and active duty soldiers diagnosed with stress related disorders. This paper will describe the role of horticultural therapy use in military veterans and active duty soldiers diagnosed with PTSD and apply these findings to refugee populations suffering from PTSD.

The Role of Horticultural Therapy in the Treatment of Refugees with Post-traumatic Stress Disorder

Introduction

The United Nations High Commissioner for Refugees (UNHCR) cites that there is an unprecedented 68.5 million people who have been forcibly displaced from their homes, with 25.4 million being classified as refugees (United Nations High Commissioner for Refugees [UNHCR], 2018). Refugees flee their countries from horrifying situations involving either war, violence, or persecution. Often, they enter the country of asylum with mental and physical health problems. A common mental health problem among refugees is posttraumatic stress disorder (PTSD). Posttraumatic stress disorder is a "trauma- and stressor-related disorder that develops after being exposed to or witnessing a traumatic event that is life threatening or threatens the integrity of one's self or others." (American Psychiatric Association [APA], 2013). Importantly, 15% of refugees are diagnosed with PTSD (Silove, Ventevogel, & Rees, 2017).

Refugees with PTSD may suffer a variety of symptoms including reoccurring memories, changes in behavior, mood swings, and avoidance of people and situations. The symptoms of PTSD prohibit them from completing their daily activities of life. Specifically, they frequently have occupational deficits in self and home care activities, education and work roles, and social and leisure interests. These deficits are exacerbated when they enter into a new and unfamiliar country. For example, there is often both language and cultural barriers that inhibit them from activities such as finding a job or socializing with people in their new community.

Occupational therapy is one of the only professions that helps people of all ages complete meaningful daily activities using therapeutic activities (AOTA, 2015). They have the academic background to help individuals with PTSD, therefore, there is potential for them to treat refugees with PTSD. Traditionally, occupational therapists have used group or individual sessions targeting mindfulness and relaxation techniques as well as coping and management skills to rehabilitate individuals with PTSD. Recently however, occupational therapists have incorporated the use of horticultural therapy to treat patients diagnosed with PSTD.

Horticultural therapy engages a person in gardening and plant-based activities to achieve specific therapeutic treatment goals. Previous studies have shown its effectiveness in treating PTSD in veterans and active duty military (Poulsen, Stigsdotter, & Davidsen, 2018). Horticultural therapy has also been effective in decreasing cortisol levels in veterans who struggle with PTSD (Detweiler et al., 2015). Similar to military members, refugees often suffer from PTSD because they have witnessed horrible acts of violence. Importantly, little research has been done on the effects of horticultural therapy on the refugee population diagnosed with PTSD. Therefore, the purpose of this honors thesis paper will first examine the literature to describe horticultural therapy's use in treatment of those with PTSD and second, to explore the practical and effective application of horticultural therapy in refugees diagnosed with PTSD.

Posttraumatic Stress Disorder

Post-traumatic stress disorder is a trauma- and stressor-related disorder that develops after being exposed to or witnessing a traumatic event that is life threatening or

threatens the integrity of one's self or others. (American Psychiatric Association [APA], 2013). In the general population, this disorder is rare (Helzer et al., 1987), however, because of the nature of the job, active duty servicemen and veterans are often a population group frequently diagnosed with the disorder. In fact, the disorder was only added to the Diagnostic and Statistical Manual of Mental Disorders in 1980 after seeing a trend of symptoms in soldiers returning from the Vietnam War (Helzer et al., 1987). The U.S. Department of Veteran Affairs reported prevalence rates of PTSD in veterans by service area. 11-20% of veterans from Operations Iraqi Freedom and Enduring Freedom, 12% from the Gulf War, and 30% of veterans from the Vietnam War were diagnosed with PTSD after their return ("VA/Dod Clinical Practice Guideline for Management of Post-Traumatic Stress," 2010)

Symptoms & Causes

The symptoms that these Vietnam veterans suffered were hyper alertness, reliving the combat experience, emotional numbing, and survivors' guilt (Helzer et al., 1987). Since that time period, a label of post-traumatic stress disorder and extensive research has been done in this area. In 2013, the American Psychiatric Association updated the PTSD diagnostic criteria from "anxiety disorders" to "trauma and sensory-related disorders" (DSM-5). The American Psychiatric Association (APA) categorized the symptoms into the following:

- Intrusion—spontaneous memories of the traumatic event, recurrent dreams related to it, flashbacks, or other intense or prolonged psychological distress

- Avoidance—distressing memories, thoughts, feelings, or external reminders of the event
- Negative cognitions and mood—myriad feelings including a distorted sense of blame of self or others, persistent negative emotions (e.g., fear, guilt, shame), feelings of detachment or alienation, and constricted affect (e.g., inability to experience positive emotions)
- Arousal—aggressive, reckless, or self-destructive behavior; sleep disturbances; hypervigilance or related problems

The types of trauma that can induce PTSD have also been extended. Traumatic events range from sexual assault, natural disasters, motor vehicle accidents, crime experiences, and even orthopedic trauma (Frans et al., 2005; Starr et al., 2004). Such an increase in the amount of associated causes give the healthcare practitioner an improved ability to recognize the disorder in population groups that may be more vulnerable.

Treatment Methods

In previous years, a wide variety of treatment methods, including both cognitive treatments and pharmacotherapy, have been studied. Some methods have shown evidence of being more effective than others. However, traditional treatment methods have shown most effective in treating the PTSD symptoms of veterans and active duty servicemen.

Cognitive behavioral therapy (CBT). In the treatment of veterans, the Institute of Medicine deemed CBT as the most effective in treating the symptoms of sensory and trauma-related disorders ("Treatment of Posttraumatic Stress Disorder: An Assessment of the Evidence," 2008). There are two types of CBT: cognitive processing therapy and

prolonged exposure. Both of these therapies are recommended by the Department of Defense in treating veterans ("VA/Dod Clinical Practice Guideline for Management of Post-Traumatic Stress," 2010). Cognitive therapy was first created to treat victims of sexual assault who had PTSD. The therapy focuses on the impact of the trauma. For example, the therapist will help the patient identify the negative emotions associated with the trauma. After the therapist helps the patient understand how those emotions cause stress, they can work to replace those thoughts and cope with the negative emotions. The other type of CBT, prolonged exposure therapy, has shown to be effective in 60% of veterans with PTSD (Jin, 2013). In this type of therapy, the patient mentally revisits the trauma while sitting in a safe, clinical setting. The purpose is to help the patient cope with those feelings of distress and terror. When in a clinical setting, the patient is able to understand how he/she reacts to the memories of the trauma. From there, he/she has the ability to learn how to identify these reactions and begin learning and utilizing the appropriate coping mechanisms.

Eye-movement desensitization and reprocessing (EMDR). The goal of this type of therapy is to help the patient process the trauma. In EMDR, the individual focuses on a back-and-forth movement or sound. This movement or sound can be anything from a flashing light to a beeping tone. It is during this repetitive motion or sound that the patient recalls the memories of the trauma. The individual continues recalling the trauma in intervals until their negative emotions decrease. The next step in the therapy is to begin replacing those negative thoughts with positive thoughts while still listening or looking at the repetitive motion or sound. The notion behind EMDR is that an individual is able to

reprocess traumatic information more easily if they are focusing on a different stimulus. Although this type of therapy was considered controversial, it is now a widely approved therapy used among veterans and military members ("VA/Dod Clinical Practice Guideline for Management of Post-Traumatic Stress," 2010).

Pharmacotherapy. Often, individuals with PTSD prefer a combination of medication and therapy. In these individual cases a pharmacotherapy approach is taken. The strongest evidence supports selective serotonin reuptake inhibitors (SSRI) as the most effective medication for treating people suffering from PTSD (Puetz et al., 2015). SSRIs are the most commonly prescribed antidepressant among veterans, but they are also used for anxiety disorders. This type of medication decreases the symptoms of depression and anxiety by increasing the levels of serotonin in the brain. Serotonin is one of the neurotransmitters that carries electrical signals between a person's brain cells. SSRIs block the reuptake of serotonin in the brain, which in turn makes more serotonin available. Puetz et al. (2015) determined that pharmacotherapy specifically using SSRIs was more effective in treating combat veterans with PTSD compared to other medications. This medication, combined with a therapy such as cognitive therapy has shown very effective in the treatment of PTSD symptoms in veterans ("Institute of Medicine," 2008).

Refugee Population

Presently, 68.5 million people have been forcibly displaced worldwide, with 25.4 million classified as refugees (UNHCR, 2018). Refugees are fleeing mainly from Syria, Afghanistan and South Sudan (UNHCR, 2018). Over six million of them have entered

into host countries such as Turkey, Pakistan and Uganda (UNHCR, 2018). Refugees flee their countries from situations involving either war, violence, or persecution. The resulting psychological trauma often leads to long-lasting mental health concerns.

In a study by Kleijn et al. (2001), 330 refugees were interviewed about their trauma related experiences. Although demographic data did not include the refugees' country of origin, the refugees native languages were collected. The languages represented in this sample were: English, Arabic, Farsi, Serbo-Croatian, and Russian. Each of the refugees had fled from their country of origin to the Netherlands. In addition to the interview, the participants were given a Harvard Trauma Questionnaire, which consisted of questions pertaining to traumatic events, PTSD symptoms, and additional culture-related PTSD symptoms (Kleijn et al., 2001). They were also given a Hopkins Symptom Checklist which asked questions related to anxiety and depression symptoms (Kleijn et al., 2001). The results of this study reported the following: 37% of refugees reported incidents of torture, 37% stated that they had been close to death, and 35% witnessed a family member or friend killed (Kleijn et al., 2001). Data analysis of these events suggested an association between the trauma and PTSD symptoms.

Host countries often lack the information and resources to effectively treat the mental health needs of this population. While the practice of identifying infectious diseases among refugees is a standardized practice, the identification of mental health illness lags far behind ("Mental Health," n.d.). To combat this, the Centers for Disease Control and Prevention (CDC) has created health profiles of refugees from nine different countries that include the most prevalent mental health concerns. These concerns include

the following: developmental disorders, mood disorders, anxiety disorders, psychotic disorders, substance-related disorders, and personality disorders (Centers for Disease Control [CDC], 2012). Specifically, the most prevalent mental health disorders among refugees include posttraumatic stress disorder, major depression, generalized anxiety, panic attacks, adjustment disorder and somatization ("Mental Health," n.d.). One study identified PTSD as the most common mental illness in the refugee population upon arrival to the host country (Giacco et al., 2018). Giacco et al. (2018) argued that poor social integration of the refugees as well as difficulties in accessing healthcare only worsen the negative mental health effects. In another study, it is reported that 15% of refugees suffer from posttraumatic stress disorder in comparison to the 1.1% average of the general global population (Silove et al., 2017).

Occupational Therapy and Posttraumatic Stress Disorder

Occupational therapy is "the only profession that helps people across the lifespan to do the things they want and need to do through the therapeutic use of daily activities (occupations)" (American Occupational Therapy Association [AOTA], 2015). The profession's roots are found in mental health. During World War I and World War II, rehabilitation aids (now known as occupational therapists) led activities for veterans. The goal of the rehabilitation aids was to keep their patients occupied and provide them with a therapeutic activity to improve their mental health status. Many of the soldiers returning from these wars were suffering from trauma and sensory-related disorders like PTSD. These therapeutic, purposeful activities helped alleviate the stress-related symptoms of their trauma.

Occupational Deficits and PTSD

Occupational therapists focus on an individual's ability to complete daily activities of life. If a person is struggling in this area, then an occupational therapist has potential to treat them. This includes therapists treating an individual who has mental health issues that inhibit them from completing daily activities.

AOTA has taken a strong position on the role of occupational therapy and the mental health problem of PTSD. Individuals with the mental health issue of PTSD experience many difficulties completing their day to day activities. The distress that the disorder causes can affect the person's ability to perform self and home care activities, education and work roles, and social and leisure interests (AOTA, 2015). Also, the ability to participate in healthy relationships is often affected. When individuals with PTSD feel they have nowhere to turn, there is an increased chance that they will begin self-mutilating or abusing substances. A study showed that veterans who returned to the U.S. after service in Operation Iraqi Freedom and Operation Enduring Freedom were likely to experience occupational disruptions in their lives (Plach & Sells, 2013). One third of the cohort experienced either PTSD, traumatic brain injury, or major depression. The top five occupational performance challenges were engagement in relationships, school, physical health, sleeping, and driving (Plach & Sells, 2013). Occupational therapists have the unique ability to help individuals struggling with this disorder because of their expertise in assisting individuals who have difficulty completing meaningful daily activities.

Occupational Therapy Treatments

Occupational therapy treatments can be performed in both group and individual sessions. In the initial patient evaluation, all of the patient's occupational deficits and barriers to completing their occupations are identified. These barriers might include aspects like patient needs, trauma triggers, or environmental factors.

There are a multitude of methods that OTs use when treating people with PTSD; one important method is mindfulness and relaxation techniques. This type of treatment was originally designed for individuals with major depression, but has shown potential for individuals with combat-related PTSD (King et al., 2013). Mindfulness based interventions attempt to help individuals pay focused attention to the negative emotions related to the traumatic event in a nonjudgmental manner. The relaxation techniques include an activity such as meditation, journaling, or breathing exercises.

Another technique OTs will often employ are coping and management skills. Speicher, Walter, & Chard (2014) utilized a variety of coping and management skills in their treatment of twenty six veterans. These skills were demonstrated in classes in anger management, communication skills, coping and social interaction, self-awareness and regulation tools, and cognitive compensatory strategies (Speicher et al., 2013). These types of classes were intended to help the patients manage their emotions in a healthier manner. This program also promoted management skills through purposeful activities and self-directed occupations. The purposeful activities consisted of learning how to budget and role playing in scenarios such as a job interview. In self-directed occupations, patients had the opportunity to choose an occupation that they would like to pursue when

they exit the program. For some, this occupation was volunteering so the OT would assist in helping the individual fill out the application and pursue the desired occupation.

Horticultural Therapy

History

The practice of horticultural therapy began around the 19th century. Dr. Benjamin Rush is the first known physician to document the positive effects of this type of therapy on his patients (Simson & Straus, 2007). In 1798, Dr. Rush found that field labor in a farm had curative effects on mentally ill patients (Simson & Straus, 2007). Those findings initiated further research in both the U.S. and Europe in the subsequent years (Simson & Straus, 2007). In 1817, the first private psychiatric institution opened in Philadelphia. This institution, the Asylum for Persons Deprived of their Reason, created a park-like setting that included green space, walk ways, and plenty of vegetation (Simson & Straus, 2007). Patients were able to partake in horticultural activities such as planting and harvesting fruits and vegetables (Simson & Straus, 2007). The use of gardening and labor continued to be more widely researched and approved throughout the rest of the 1800's. In 1899, E.R Johnston touted the positive benefits of sensory stimulation from working with plants and gardens. He explained that this type of stimulation allowed mentally handicapped children to learn in a unique and accessible way. Johnston's findings were further supported a year later from research performed by G.M. Lawrence in an article titled "Principles of Education for the Feeble Minded."

While the 1800's established the importance of horticultural therapy in the treatment of mentally ill patients, the role of horticultural therapy in treating physical disabilities began in the 1900's (Simson & Straus, 2007). With both of the World Wars in this era, there was a growing demand for rehabilitation programs for soldiers with disabilities. In 1917, horticultural therapy was validated as a treatment method when occupational therapists offered an educational course in horticulture to other healthcare practitioners at a local hospital (Simson & Straus, 2007). The treatment method was included in occupational therapy textbooks in the following years (Simson & Straus, 2007). As research continued throughout the latter half of the 1900's, evidence continued to grow for the treatment as well. Currently, we see many health facilities adopting facets of horticultural therapy like gardens and scenic walkways because of the evidence that continues to support this treatment.

Defining Horticultural Therapy

Horticultural therapy (HT) is not a new concept. It is defined as the engagement of a person in gardening or plant-based activities, facilitated by a trained therapist, to achieve specific therapeutic goals (American Horticultural Therapy Association [AHTA]). Today, it is widely used and accepted in clinical and rehabilitative settings. The therapy is intended to improve a person's overall well-being. In the physical sense, HT is able to help a person strengthen muscles and improve coordination, balance, and endurance (AHTA). Mentally, HT helps people improve memory, cognition abilities, task initiation, language skills, and socialization (AHTA). When working with a trained

therapist, individuals are able to learn to follow directions, work independently, and problem solve (AHTA). The therapy type has been shown to benefit individuals with the diagnoses of dementia, PTSD, schizophrenia and depression (Gonzalez, (2014); Poulsen, (2018);Yun-Ah, (2018); Detweiler, (2015)). Therefore, since HT has been effective in treating certain populations with PTSD, it may also have potential in treating refugees with PTSD.

Therapeutic Gardens

The American Horticultural Therapy Association (AHTA) explains that a garden must be designed to meet the needs of a specific user or population in order to be labeled a "therapeutic garden." These gardens are designed to be used as one element of a treatment or program. They have been used and noted as beneficial to patients with mental health problems like dementia and schizophrenia (Zeisel, 2008). The patient's health concerns can be addressed through the design of the garden. For instance, a garden at a dementia home may have many plants of different colors, textures, and fragrances in order to promote the intended sensory stimulation of the individual. There may be an ample number of benches provided in order to accommodate the elders' stamina. The pathway and entrances into the garden may be created to be handicap accessible. Likewise, if this garden were located at a mental health facility there may be gardening stations with activities set up around the garden. This environment also addresses the cognitive needs of the patient. For instance, gardens promote socialization among patients as well as a space to de-stress and calm their autonomic system.

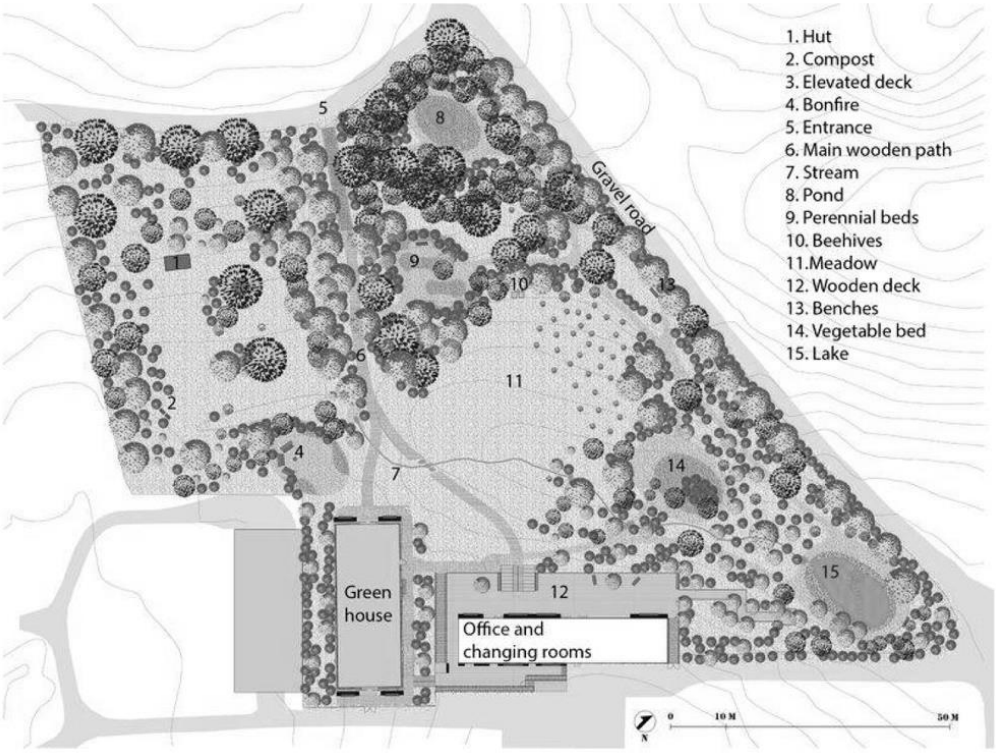

Figure 1. A map of the therapy garden, Nacadia, in the University of Copenhagen. Taken from: Poulsen, D. V., Stigsdotter, U. K., & Davidsen, A. S. (2018). "That guy, is he really sick at all?" an analysis of how veterans with PTSD experience nature-based therapy. *Healthcare*, 6(2), 64. DOI: 10.3390/healthcare6020064. CC BY 4.0.

One of the main purposes of a therapy garden is to calm the central nervous system and reduce feelings of hyper arousal. At the University of Copenhagen, Corazon and colleagues created and performed research on a therapy garden named "Nacadia" that abides by an evidence-based health design. The map in Figure 1 displays the design of Nacadia. It is considered a healing forest garden because of its inclusion of trees, shrubs, and perennial plants (Corazon, Stigsdotter, Jensen & Nilsson, 2010). The garden was

designed with the intent of being included in a 10-week treatment program for veterans with stress and trauma related disorders.

The garden is comprised of four areas of varying difficulty levels, each corresponding to a treatment level. As the patient progresses through treatment, the goal is that he/she would progress through the four areas of the garden as well. Area 1 is the least demanding, with brimming foliage and small winding paths that foster feelings of safety and refuge. The therapeutic activities in this area are sitting, walking, picking berries, and experiencing nature. Area 2 is located in front of the greenhouse and gardeners' building and allows for increased social interaction. The patient is able to participate in horticultural activities such as planting seeds, re-potting plants, maintaining the plants, and harvesting fruits and vegetables. Area 3 is a more open space located immediately outside of the forest garden. This area is intended for larger projects such as building a tree house or creating a pond. Lastly, Area 4 is the most demanding because it is a flat, open space where there is no place to seek refuge and the participant is easily seen (Corazon et al., 2010).

The garden Nacadia is used as a supplement to cognitive treatment at the facility. Within the umbrella of cognitive treatment, Acceptance and Commitment Theory as well as Mindfulness-Based Cognitive Therapy are used in treating patients with a stress and trauma related disorder. These therapies are woven into the activities that take place in the garden and include sensory experiences, horticultural activities, and nature-based stories and symbols. The goal is that the participants will connect with nature and the

environment will provide a safe space where the individual is able to discuss and explore his/her emotions more freely (Corazon et al., 2010).

Horticultural Therapy and PTSD

Many studies have shown positive associations between horticultural therapy and improved symptoms of PTSD. Importantly, these results have been most notable in veterans and active duty servicemen. Currently, 20% of active duty soldiers and 42% of reserve unit soldiers need mental health treatment. Concerning veterans, 31% have been diagnosed with a mental health illness, with the single most common being PTSD (Seal et al., 2007). Because there has been substantial research on this specific population, it is imperative to examine the studies that have been performed analyzing the effects of horticultural therapy on veterans with PTSD. If this method has been effective in treating soldiers' PTSD symptoms, then it may prove to be an effective method in treating refugees with PTSD as well. The following is a review of the current literature detailing the effects of horticultural therapy on the PTSD symptoms of veterans and active duty servicemen.

Reduction of Bodily Symptoms

People suffering from PTSD often experience symptoms such as pain, sleep disturbances, high arousal, and flashbacks. In one study, veterans with PTSD participated in horticultural therapy for a 10-week span of time (Poulsen, Stigsdotter, & Davidsen, 2018). Participants reported a reduction in bodily symptoms in their interview after 10 weeks as well as the interview performed a year later (Poulsen et al., 2018). In another study, veterans suffering from PTSD took part in a 28-day treatment program (Detweiler

et al., 2015). At the end of the study they filled out a Post-traumatic Stress Disorder Civilian Checklist (PCLC). The PCLC inquired about symptoms such as disturbing dreams and memories, avoidance of activities or situations related to trauma, and physical reactions to reminders of trauma. There was an overall decrease in the PCLC report scores after the treatment ended.

Reduction of Cortisol Levels

Cortisol is referred to as the body's "stress hormone." Heightened levels of cortisol are associated with high levels of stress. Therefore, many people that suffer from the stress disorder PTSD experience higher cortisol levels than those without. Horticultural therapy has been effective in decreasing these cortisol levels. One study showed the effectiveness of simply looking at urban green environments in decreasing salivary cortisol levels (Tyrväinen et al., 2014). Another study involved participants performing a stressful task and either reading or gardening afterwards (Van Den Berg & Clusters, 2010). Salivary cortisol levels were taken consistently and were significantly decreased in those that gardened versus those who read after the task. A study was performed specifically on horticultural therapy and its effects on veterans with PTSD (Detweiler et al., 2015). In this study, patients in a 28-day substance abuse treatment program participated in planting, growing, and harvesting a plant as well as spending time in a garden. The study found that those who took part in the horticultural therapy had a 12% decrease in cortisol levels after completion of the 28 day program (Detweiler et al., 2015).

Self-Identity and Autonomy

Often when individuals experience trauma it affects their perception of self, as well as, their ability to act and make independent decisions. This type of autonomy is imperative for individuals to regain control of their lives after suffering the traumatic event. Poulsen et al. (2018) described veterans with PTSD as having created a new identity after 10 weeks of horticultural therapy. Veterans were able to learn to accept the loss of their prior identity as a soldier and find a new identity (Poulsen et al., 2018). In another study, veterans self-initiated horticultural therapy as a facet of their stay at a 28 day treatment program (Lehmann et al., 2018). Lehmann et al. (2018) interpreted this initiation as the patient gaining autonomy and an understanding of the value of horticultural therapy as a stress reducing modality.

Horticultural Therapy with Refugees with PTSD

There are no present studies to suggest that horticultural therapy has been used as a method of treating refugees with PTSD. Refugees and military members both experience traumas that lead to the same core symptoms of PTSD; reoccurring memories, changes in behavior, mood swings, and avoidance of people and situations. Horticultural therapy has shown effectiveness in the co-treatment of PTSD symptoms of veterans and active duty servicemen. Therefore, it may hold potential for treating the refugee population with the same ailment.

Horticultural therapy may be a practical treatment method to implement in refugee camps. Any available small plot of fertile soil with ample lighting is sufficient for plant growth. Also, depending on the country of origin, some refugees may already be

equipped with the skills to be able to plant, grow, maintain, and harvest vegetation. This therapy would give refugees an appropriate outlet to keep active throughout the day and utilize their skillset. Refugees who do not come from a farming background would have the ability to learn horticultural skills. This may benefit them in the sense that they can translate these skills to their new country of origin. It would assist them financially because they would be able to grow their own food as well as qualify for agricultural jobs.

This type of therapy would also help refugees with PTSD improve cognitively. Individuals with PTSD tend to isolate themselves from social interaction. Participating in horticultural activities in a garden would allow them to interact with others and share a common interest in a safe environment. Refugees with PTSD often feel a sense of helplessness and worthlessness. The act of planting, growing, maintaining, and harvesting a plant creates a sense of autonomy and self-efficacy in the refugee that may alleviate their negative emotions. The environment of a therapeutic garden or horticultural activity has shown effectiveness in decreasing cortisol levels (stress hormone) in individuals. Thus, it may have the same effect in refugees with this stress and trauma-related disorder. While horticultural therapy may help the individual cognitively, it may also alleviate the additional stress caused by relocating.

Acclimating to a new country after fleeing from trauma ridden circumstances can prove to be incredibly difficult. When people are forced to relocate, they often feel as if they are losing their identity and culture. Burnett (2013) conducted a study of twenty refugees from Eastern Europe, the Middle East, South Asia, Southeast Asia, and sub-

Saharan Africa who sought asylum in the Czech Republic. Many refugees expressed difficulty finding ways to acclimate to the new environment while preserving their own culture. They also had difficulty adjusting to the label of "refugee" in the new country, a term that often holds negative prejudices. This study also found that most of the sample of refugees felt like "outsiders," and even faced discrimination in some areas of their host community. Burnett (2013) also discusses the negative image that the media portrays with regard to refugees and the potential impact on their identity. Refugees expressed wanting to be viewed differently than what was covered by the media (Burnett, 2013).

These new difficulties can exacerbate the already existing stress in a refugee. Horticultural therapy may help the refugee feel more "at home" in their new country by allowing them to be able to grow indigenous fruits and vegetables. The participation in new horticultural activities can help the refugee develop a new identity and sense of autonomy. These senses of identity and independence are imperative for a refugee with PTSD to be able to attain a high quality of life in a new host country. Horticultural therapy shows tremendous potential for helping refugees in each of these problem areas that are related to the disorder.

Limitations

As a result of the often chaotic circumstances that refugees flee from, much of the information surrounding a refugee's pre and post migration is unclear. This situation leaves researchers only seeing bits of disconnected information rather than the full picture. One important limitation to consider is that when the physical needs of refugees are not met, a disorder like PTSD may not surface. Other limitations are the cultural

barriers between refugees and the health care practitioners in the country of refuge. For example, language barriers often inhibit the practitioner from being able to diagnose the refugee correctly. Moreover, refugees may be uncomfortable with discussing mental health issues with their providers because of the cultural difference (Ahmed, 2007). Posttraumatic stress disorder can also result from sexual assault. In many countries, there is a negative stigma of shame attached to sexual assault, and in some regions, a family will disown the child if they have been sexually assaulted. This social stigma may deter the refugee from sharing their experiences with health care providers. A final limitation is that refugees often have limited access to healthcare for multiple reasons. Specifically, they may have restricted means of transport, poor financials, or inadequate information about the availability of services.

Conclusion

Horticultural therapy is a promising method of supplemental treatment for the refugee population with PTSD. This disorder affects the individual's ability to participate in work, leisure, and social activities. Therefore, an occupational therapist may be able to assist them because they are equipped with the skills to help people participate in meaningful occupations on a daily basis. Importantly, horticultural therapy is a supplemental treatment method that has been effective in treating veteran and military groups with PTSD. Therapeutic gardens involving horticultural activities have been effective in alleviating the negative symptoms of the disorder. An occupational therapist has the skillset and educational background to assist individuals with this disorder, and it shares similar roots to horticultural therapy. Both occupational therapy and horticultural

therapy hold the belief that activity promotes health. Therefore, horticultural therapy may be a viable treatment method for occupational therapists to use to treat refugees with PTSD. An occupational therapist may be able to utilize horticultural therapy in their treatments by conducting their sessions in a therapeutic garden. OTs can also incorporate HT by discussing mindfulness based techniques while the individual is working with a plant. Working with the plant would promote a decrease in anxiety while the OT is attempting to replace negative emotions corresponding to the trauma with positive thoughts and coping strategies. These are only a few of the many options an occupational therapist has for integrating horticultural therapy techniques into their practice with refugees with PTSD.

There are no present studies to suggest that horticultural therapy has been utilized in the refugee population with this mental illness. Additionally, there is also a lack of screening for mental health issues in the refugee population, so the prevalence of the disorder varies in the literature. The conditions of refugee camps are often unreported, so it is difficult to tell whether therapeutic gardens would be a feasible option in many of these camps. If therapeutic gardens are feasible, it would be a cost-effective solution for keeping refugees active in these camps as well as promoting positive mental health.

For future research, the author would suggest a study to evaluate the occupational needs of the refugee population with PTSD. Additionally, the author suggests a study of horticultural therapy with the refugees and an evaluation of their PTSD symptoms. An analysis of these topics would provide occupational therapists as well as other healthcare practitioners information on how to better treat this marginalized population. According

to the World Federation of Occupational Therapists as well as the Occupational Therapy Code of Ethics, OTs have a distinct responsibility to provide social justice to the refugee population. Utilizing a supplemental, evidence-based method like horticultural therapy may be an effective means of treating refugees with PTSD.

References

Ahmed, A. (2007). Post-traumatic stress disorder, resilience and vulnerability. *Advances in Psychiatric Treatment, 13*(5), 369-375. doi:10.1192/apt.bp.106.003236

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Burnett, K. & Office of the United Nations High Commissioner for Refugees. Policy Development and Evaluation Service (2013). *Feeling like an outsider: a case study of refugee identity in the Czech Republic*. UNHCR, Policy Development and Evaluation Service, Geneva

Corazon, S.S., Stigsdotter, U.K., Jensen, A.G.C., & Nilsson, K. (2010). Development of the Nature-Based Therapy Concept for Patients with Stress-Related Illness at the Danish Healing Forest Garden Nacadia. *Journal of Therapeutic Horticulture, 20*, 33–51.

Department of Defense, Department of Veteran Affairs. (2010). *VA/Dod Clinical Practice Guideline for Management of Post-Traumatic Stress*. Retrieved from https://www.healthquality.va.gov/PTSD-FULL-2010c.pdf

Detweiler, M. B., Self, J. A., Lane, S., Spencer, L., Lutgens, B., Kim, D., ... Lehmann, L. (2015). Horticultural therapy: A pilot study on modulating cortisol levels and indices of substance craving, posttraumatic stress disorder, depression, and quality of life in veterans. *Alternative Therapies in Health and Medicine, 21*(4), 36-41. Retrieved from

http://ezproxy.liberty.edu/login?url=https://search.proquest.com/docview/1696474522?accountid=12085

Giacco, D., Laxhman, N., & Priebe, S. (2018). Prevalence of and risk factors for mental disorders in refugees. *Seminars in Cell and Developmental Biology, 77,* 144-152. doi:10.1016/j.semcdb.2017.11.030

Global Trends: Forced Displacement in 2017(Rep.). (2018). Retrieved https://www.unhcr.org/5b27be547.pdf

Gonzalez, M. T., & Kirkevold, M. (2014), Benefits of sensory garden and horticultural activities in dementia care: a modified scoping review. *Journal of Clinical Nursing, 23,* 2698-2715. doi:10.1111/jocn.12388

Helzer, J. E., Robins, L. N., & Mcevoy, L. (1987). Post-Traumatic Stress Disorder in the General Population. *New England Journal of Medicine, 317*(26), 1630-1634. doi:10.1056/nejm198712243172604

Institute of Medicine. 2008. *Treatment of Posttraumatic Stress Disorder: An Assessment of the Evidence.* Washington, DC: The National Academics Press. https://doi.org/10.17226/11955

Jill, J. (2013). Effectiveness of National Implementation of Prolonged Exposure Therapy in Veterans Affairs Care. *JAMA : the Journal of the American Medical Association, 310*(18).

King, A.P., Erickson, T.M., Giardino, N.D., Favorite, T.K., Rauch, S.A., Robinson, E., Kulkarni, M., & Liberzon, I. (2013). A pilot study of group mindfulness-based

cognitive therapy (MBCT) for combat veterans with posttraumatic stress disorder (PTSD). *Depression and anxiety, 30*(7), 638-645.

Kleijn, W.C., Hovens, J.E., & Rodenburg, J. J. (2001). Posttraumatic Stress Symptoms in Refugees: Assessments with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist–25 in Different Languages. *Psychological Reports, 88*(2), 527–532. https://doi.org/10.2466/pr0.2001.88.2.527

Lehmann, L. P., Detweiler, J. G., & Detweiler, M. B. (2018). Veterans in substance abuse treatment program self-initiate box gardening as a stress reducing therapeutic modality. *Complementary Therapies in Medicine, 36,* 50-53. doi:http://dx.doi.org.ezproxy.liberty.edu/10.1016/j.ctim.2017.10.013

Plach, H. L., & Sells, C. H. (2013). Occupational performance needs of young veterans. *The American Journal of Occupational Therapy, 67*(1), 73-81. doi:http://dx.doi.org/10.5014/ajot.2013.003871

Poulsen, D. V., Stigsdotter, U. K., & Davidsen, A. S. (2018). "That guy, is he really sick at all?" an analysis of how veterans with PTSD experience nature-based therapy. *Healthcare, 6*(2), 64. doi:http://dx.doi.org.ezproxy.liberty.edu/10.3390/healthcare6020064

Puetz, T. W., Youngstedt, S. D., & Herring, M. P. (2015). Effects of pharmacotherapy on combat-related PTSD, anxiety, and depression: A systematic review and meta-regression analysis. *PLoS One, 10*(5) doi:http://dx.doi.org/10.1371/journal.pone.0126529

Seal, K. H., Bertenthal, D., Miner, C. R., Sen, S., & Marmar, C. R. (2007). Bringing the war back home: Mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen at department of veteran's affairs facilities. *Archives of Internal Medicine, 167*(5), 476-482. doi:http://dx.doi.org/10.1001/archinte.167.5.476

Silove, D., Ventevogel, P., & Rees, S. (2017). The contemporary refugee crisis: an overview of mental health challenges. *World Psychiatry, 16*(2). https://doi.org/10.1002/wps.20438

Simson, S., & Straus, M. (2007). *Horticulture as therapy*. New York: Food Products Press.

Speicher, S. M., Walter, K. H., & Chard, K. M. (2014). Interdisciplinary residential treatment of posttraumatic stress disorder and traumatic brain injury: Effects on symptom severity and occupational performance and satisfaction. *The American Journal of Occupational Therapy, 68*(4), 412-21. doi:http://dx.doi.org/10.5014/ajot.2014.011304

Tyrvaeinen, L., Ojala, A., Korpela, K., Lanki, T., Tsunetsugu, Y., & Kagawa, T. (2014). The influence of urban green environments on stress relief measures: A field experiment. *Journal of Environmental Psychology, 38*, 1-9. doi:http://dx.doi.org/10.1016/j.jenvp.2013.12.005

Van Den Berg, A. E., & Custers, M. H. G. (2011). Gardening promotes neuroendocrine and affective restoration from stress. *Journal of Health Psychology, 16*(1), 3-11. doi:http://dx.doi.org/10.1177/1359105310365577

Yun-Ah, O., Park, S., & Ahn, B. (2018). Assessment of the psychopathological Effects of a horticultural therapy program in patients with schizophrenia. *Complementary therapies in medicine 36,* 54-58. doi:10.1016/j.ctim.2017.11.019

Zeisel, J. (2007). Creating a therapeutic garden that works for people living with Alzheimer's. *Journal of Housing for the Elderly, 21*(1-2), 13-33. doi:http://dx.doi.org/10.1300/J081v21n01_02