THE IMPACTS OF THERAPEUTIC GARDENING: PERSPECTIVES FROM VETERANS AND PROFESSIONALS

A Thesis submitted to the faculty at Stanbridge University in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy

by

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September 2021

Certification of Approval

I certify that I have read The Impacts of Therapeutic Gardening: Perspectives from Veterans and Professionals by Patricia Arabaca, Jemma Balaoen, Robert Piacentini, and Gabriella Sehwani, and in my opinion, this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.

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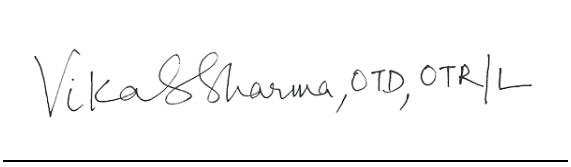

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Acknowledgements

First, we would like to thank our thesis advisor, Dr. Annette Hatala, OTD/OTR/L, for her guidance and support throughout the entire process. We would also like to thank Stanbridge staff, Dr. Alexander Moran, Fred Poling, and Dr. Dominique Wascher, for helping us access articles, and providing guidance and feedback on our literature review and methodology. Lastly, we would like to thank our family and friends for all their continued love and support throughout this program.

Abstract

The veteran population is prone to experiencing a variety of negative conditions related to physical disability, mental health, and/or occupational engagement when returning home from service. While there are different types of treatments and therapies used to address these issues, therapeutic gardening is one form of therapy that has shown to have a positive impact on overall health, well-being, and quality of life with varying populations. The purpose of this qualitative study was to use the results of semi-structured interviews with veterans and a gardening professional to consider how therapeutic gardening affects veterans, as well as the barriers and benefits faced with the implementation and maintenance of a gardening program for therapeutic use. Our results confirmed our hypothesis that gardening is an effective therapeutic tool. Our case study with a gardening professional discussed the implementation of a gardening program and explained client outcomes regarding social and emotional well-being. From interviews with two veterans, four themes emerged regarding the benefits they felt from therapeutic gardening: social well-being, emotional well-being, gardening as a therapy, and exploring new occupations. The implication to occupational therapy is that clients may use gardening as an occupation to develop certain physical, social, and cognitive skills. Further research and investigation should be conducted to create a gardening program before implementation for the veteran population.

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The Impacts of Therapeutic Gardening: Perspectives from Veterans and Professionals

Almost 19 million individuals were labeled as veterans in 2019, and 25% of those veterans are living with disability related to their military service (Scaffa, 2020; U.S. Bureau of Labor Statistics, 2020). Veterans are a vulnerable, underserved population that face many issues following service (Cogan et al., 2018; Rossiter et al., 2018). After having faced a multitude of traumatic events at war, coming back home can lead to great disconnect at home and within social circles (Ahern et al., 2015). Multiple studies have found that approximately 14–28% of veterans are diagnosed with posttraumatic stress disorder (PTSD), 13–14% had depression, and 3–5% struggled with alcohol or substance abuse (Seal et al., 2011; Tanielian et al., 2008; Teeters et al., 2017; Thomas et al., 2010; Zinzow et al., 2012). Veterans often struggle in major life areas, such as participating in activities of daily living, seeking or maintaining employment, maintaining interpersonal relationships, and reintegrating into their communities after serving (Kukla et al., 2015).

There have been different treatments and therapies used to tend to this population (Menefee et al., 2016). Cognitive-behavioral therapy is commonly used for treating veterans as it focuses on changing negative and dysfunctional thought patterns and behaviors (Zinzow et al., 2012). To treat PTSD specifically, prolonged exposure therapy is used. This form of therapy involves repeated exposure to traumatic memories and trauma-related feelings and situations, which can help in reducing psychological symptoms among veterans (Zinzow et al., 2012). These are the types of therapies offered, but more recently therapists have begun to use therapeutic gardening, which was first reported in the United States by Dr. Benjamin Rush, who is known as the father of

American psychiatry (Davis, 1997). According to the American Horticulture Therapy Association (2017), a garden is therapeutic when it is used as a component of treatment, rehabilitation, or vocational program to meet the goals of the participant and to promote people and plant interactions.

When implementing a garden program for veterans, it is important to look at the different ways in which individuals interact with nature and plants. The interactions between people and plants involve activities of both active and passive processes: physical exertion, tactile immersion, and peaceful abiding (DelSesto, 2020). Physical exertion and tactile immersion are active processes. Peaceful abiding is considered a passive process. Physical exertion involves activities such as digging or tilling the soil, moving through the garden, weeding, or participating in non-plant activities in plant environments. Tactile immersion is the physical way in which the client feels the soil, leaves, and other textures that plant life offers. This may also involve sorting and counting seeds or plants. Peaceful abiding is the passive process in which the client interacts with the garden in a restful but attentive state. This can be done through sensory engagement with the garden by appreciating the colors, movements, and sounds that are facilitated by the garden environment.

The Role of Occupational Therapists with Veterans

Occupational therapy (OT) plays a key role when working with the veteran population by using a holistic approach. This aligns with the Veteran Recovery Resources' mission to promote the overall well-being of veterans (Scaffa, 2020). This organization was started by veterans to serve the veteran population with the incorporation of OT. In the military, veteran occupations were predetermined, whereas

after returning home they are expected to readjust into previous daily routines and reintegrate into their communities, which can be difficult. Additionally, veterans may also experience occupational deprivation because they may lack opportunities to engage in meaningful occupations, which may compromise their health and well-being (Wagenfeld & Atchison, 2014; Wilcock, 1998). Occupations are considered "the personal activities that individuals choose or need to engage in" (Boyt Schell et al., 2019, p. 322). Karen Duddy, an occupational therapist at the Veterans Affairs in Long Beach, California, has stated that "occupation influences health" and doing "what we enjoy keeps us healthier and improves the quality of our lives" (2015, para. 4 and 10). OT has become an essential service to help veterans by promoting community and occupational engagement, improving health management, maintaining skills and behaviors, and improving overall quality of life.

Literature Review

The veteran population is a group of individuals often living with trauma as a result of the events that they experienced during their service (Cifu et al., 2013). These negative circumstances impact the ongoing lives of the veterans and the lives of those within their social circles. Veterans are often dealing with issues arising such as joblessness, physical and emotional self-harm, trouble sleeping, marital conflicts, and complications with developing interpersonal relationships (Ahern et al., 2015; Poulsen et al., 2016; Scaffa, 2020).

Issues Veterans Face

Returning home, no longer being in the military, and difficulty with transitioning back into civilian life are issues that many veterans encounter. Ahern et al. (2015)

conducted interviews with 24 veterans and found three common themes involved with the difficulties of coming back home post-service: one, that the military gave structure and a family that one learned to live with; two, that coming back home led them to feeling as though their lives lacked structure, support, connection with others, and purpose; and three, that finding a new normal was a struggle for many. The difference in structure between the military and civilian life impacts the quality of life for many veterans. Moreover, Georgantas et al. (2020) examined the relationship between socio-demographic features and anxiety and depression on 231 retired veterans. This study found that life satisfaction after having retired had a negative impact on the levels of anxiety that veterans experienced. Veterans who were satisfied with their lives as retirees reported 7.79 times less state anxiety, with state anxiety described as anxiety caused by a specific situation or event, than those who reported being dissatisfied with their lives after retiring. Moreover, the veterans who were happy with retiring from service displayed fewer depressive symptoms than those who were not happy that their service had concluded.

Traumatic Brain Injury, PTSD, and Chronic Pain

A traumatic brain injury (TBI), PTSD, and chronic pain are some of the other common complications that veterans live with after service. Cifu et al. (2013) analyzed patient data of veterans who received inpatient or outpatient services from facilities under the Veterans Health Administration (VHA) between the years 2009 to 2011. Data was analyzed in order to observe the prevalence of veterans living with a TBI, PTSD, and physical pain related to the head, neck, or back. The researchers found that a total of 613,391 veterans received services from the VHA at least once within the three years.

The number of individuals receiving services continue to rise each year with more than a 40% increase of patients in 2011 compared to 2009. Of these, 9.6% were diagnosed with a TBI, 29.3% experienced PTSD, 40.2% were treated for somatic pain, and 6% of the veterans were receiving care for all three conditions (Cifu et al., 2013). There are many veterans suffering from conditions that hinder their occupational performance within their communities upon returning home, and so interventions are needed to help them with these issues.

Substance Use Disorder

Veterans dealing with PTSD, depression, and anxiety or adjustment disorders often find themselves abusing substances (David et al., 2004; Poulsen et al., 2016; Seal et al., 2011). Substance use disorder remains a concern among veterans (Detweiler et al., 2015; Lehmann et al., 2018). The U.S. Department of Veteran Affairs (VA) recognizes this concern and offers a variety of programs depending on the needs of the veteran for treatment programs. Furthermore, many VA hospitals offer a Substance Abuse Residential Rehabilitation Treatment Program (SARRTP) to combat this issue (U.S. Department of Veterans Affairs, n.d.). It has been reported that about 11% of veterans that present to the VA for the first time meet criteria for substance use disorder. Teeters et al. (2017) acknowledged that not all veterans utilize and/or report substance abuse to the VA for their health services. This may be due to geographic location limiting access as well as negative stigma and shame associated with substance abuse. Additionally, drugs and alcohol were factors in 45% of nonfatal suicide attempts in the US Army from 2005-2009 (Detweiler et al., 2015). Using information sourced from the national VHA system, Bohnert et al. (2017) found that among the veterans from 2006 to 2011, the risk for

successful suicide was two to three times higher in individuals with substance use disorder. Women were also found at greater risk than men.

Gardening as a Therapeutic Intervention

There is evidence that supports the use of gardening as a therapeutic intervention for individuals with mental health conditions as it enhances their quality of life and overall well-being (McCaffrey et al., 2011; Smidl et al., 2017; Whatley et al., 2015). Gardening requires being invested in the process and the use of one's cognition to plan and sequence the steps needed to engage in active gardening tasks, such as the use of physical skills to tend to and harvest what was planted and monitoring the growth of the plants (Lehmann et al., 2018; Wagenfeld & Atchison, 2014). Moreover, gardening activities can also include passive processes, such as walking, talking, birdwatching, and cooking with the produce grown in the garden.

When an individual engages in meaningful and purposeful activities like gardening, their emotional, social, and physical well-being increases. According to Hettler's Six Dimensions of Wellness Model, physical well-being includes engaging in physical exercises, monitoring the state of body and its reaction to minor or major illnesses, and acknowledging that the body goes through changes, while emotional well-being includes becoming aware and accepting one's emotions and being able to effectively cope with situations or stress (National Wellness Institute, n.d.). Social well-being includes developing and maintaining interpersonal relationships (National Wellness Institute, n.d.). These concepts are used to validate the use of gardening as a therapeutic intervention.

Emotional Well-being

Smidl et al. (2017) established a therapeutic gardening project in a community mental health center among individuals with mood disorders, schizophrenia, and schizoaffective disorder. The purpose of the study was to explore if building and caring for a garden increases emotional well-being. By utilizing qualitative and quantitative measures to collect and analyze data about emotional well-being, they discovered that participants reported significant improvements in mood and confidence before and after engaging in gardening activities. The Energetic scale from the Visual Analog Mood Scale showed that individuals who participated more than one time felt more energetic after gardening. Data obtained from participants' journaling throughout their gardening experience indicated that the project promoted emotional well-being by increasing their pride, feelings of self-worth, and happiness.

McCaffrey et al. (2011) conducted a comparison study on gardening, walking, and art therapy and its effects on older adults who have been diagnosed with depression. The study implemented a pretest and posttest design using a Geriatric Depression Scale, Negative Emotion Words Use count, and focus group interviews to measure outcomes. The results stated there were no significant difference between the two interventions, however both interventions revealed a positive impact among the participants. Specifically, the garden walking group expressed while in the garden they enjoyed walking, took time to reflect, found a sense of courage to move on from their past, and feelings of hopefulness for the future. At the start of the interventions, almost half of their participants had scored in the severe range of depression and the other half were in the mild range of depression. At the end of the intervention, almost 90% were within the

mild range and 10% were within the normal ranges. The Negative Emotion Words Use count measured fewer negative words used by participants during their post-intervention interviews.

When comparing study participants, Smidl et al. (2017) recruited people who were diagnosed with mental conditions such as mood disorders, schizophrenia, and schizoaffective disorders, while participants in the McCaffrey et al. (2011) study were diagnosed with depression. These diagnoses are commonly found among veterans and may consequently impair their occupational participation in once meaningful activities. Therapeutic gardening could therefore serve as an effective intervention to enhance a veteran's emotional well-being, which can also improve their occupational performance to engage in valued activities.

Social Well-being

When individuals are actively participating within their communities, it can positively contribute to increasing their social well-being. Whatley et al. (2015) examined how a community garden enables occupational participation and social inclusion for people with mental illnesses. Semi-structured interviews and observations were conducted in the Sprout community garden in Melbourne, Australia to identify how participants felt about their experiences of being in the garden. The activities they engaged in involved active gardening, such as planting seeds, watering, and harvesting (Whatley et al., 2015). Participants also participated in passive gardening activities, such as having community meals in the garden using the produce that was harvested and selling the produce at a community garden market. Enabling participants to create a community was a significant theme that emerged from the study; Whatley et al. found

that social connections were established after bringing people with diverse backgrounds and experiences together into a garden. Being able to connect with others was a challenge for some participants due to their mental health conditions. However, engaging in the Sprout community garden helped mitigate the difficulties individuals may have experienced and provided opportunities for individuals to interact with each other by participating in gardening activities and working closely together, thus facilitating a better sense of community.

Maund et al. (2019) investigated the effectiveness of a six-week nature-based intervention at a wetland site in the United Kingdom. The participants were over 18 years old, physically able to participate in outdoor activities, and had been diagnosed with stress-related mental illnesses, such as depression and anxiety. The activities that participants engaged in included nature guided walks, bird watching, bird feeding, and canoeing. The study used the Warwick Edinburgh Mental Wellbeing Scale, Generalized Anxiety Disorder-7 Scale, Perceived Stress Scale, Positive and Negative Affect Schedule, and a focus group before and after the intervention to measure the outcomes. After the implementation of nature-based intervention activities, participants had improved mental wellbeing and positive affect. From pre-intervention to post-intervention scores, the Warwick Edinburgh Mental Wellbeing Scale and the Positive and Negative Affect Schedule had a significant increase in numbers, whereas the Perceived Stress Scale, negative Positive and Negative Affect Schedule, and Generalized Anxiety Disorder-7 Scale scores had a decrease. The scores entailed that the participants experienced less anxiety, negative affect, and perceived stress. The common experiences that were highlighted in the focus groups were relaxation, mitigation of their depressive and

anxiety symptoms, an improved level of confidence that influenced social interactions, and attending to their preexisting physical health conditions. The limitations of the study were that it was a pilot study, it had a small sample size, and lacked diversity in the sociodemographic characteristics of its participants.

Additionally, Lidén et al. (2016) found that women that were on long-term sick leave due to physical or mental illness significantly improved on the social aspects of the 36-item Short Form Survey assessment. This assessment was used to measure health related quality of life following a rehabilitation gardening program. The 14-week program was designed to combine aspects of horticulture therapy along with supported employment as a government funded rehabilitation program in Sweden called “the four-leaf clover project.” It was implemented by a multidisciplinary team of physiotherapists, occupational therapists, social workers, and counselors. The activities they participated in included hands-on gardening, handicraft activities, body-awareness and mindfulness exercises, and spending time in a natural environment. This gardening portion of the program was performed in groups of 8-12 women. Supported employment is an evidence-based method that utilizes a job coach at the beginning of the program to provide an individualized approach depending on the needs of the participants. Social functioning measures of the Short Form Survey showed significant improvement that was important for health-related quality of life at the conclusion of the program.

Whatley et al. (2015) and Lidén et al. (2016) explored the active processes of gardening and its effect on the social well-being of their participants, while Maund et al. (2019) studied the passive processes of a nature-based intervention and its overall effect in well-being, stress, and affect. All three studies provide evidence that supports the use

of gardening or nature-based interventions as a means to facilitate social interactions among their participants. It can also be viewed as co-occupation, an activity that can be done with more than one person. Within the veteran population, integration back into the community requires skills and confidence in social participation. Active and passive aspects of gardening have been shown to improve social function and skills to help manage the symptoms of mental illness.

Physical Well-being

Engaging in physical activity and becoming aware of how the body functions can enhance an individual's well-being. Dewi et al. (2017) explored the psychological and physical stress among participants with and without a mental illness in a community gardening program. Psychological stress was measured via a self-assessment questionnaire and a portable salivary amylase monitor. Physical stress was measured by placing electrodes on the participants to record their heart rate and their breathing rate. Although the results did not yield significant differences between the control group and the case group, the community garden acted as a stress reducer for both groups. The study implicates that participation in gardening with individuals with a mental illness can encourage physical activity and increase self-esteem. The community garden also provides a range of low to high intensity physical activities which includes walking, filling pots with soil, sowing seeds, and digging and turning over soil. The researchers discovered that participants should be given an appropriate level of physical workload because individuals with mental illness are often less physically active than those without a mental illness. This study supports that gardening can be used as an intervention for veterans to engage them in physical activity and mitigate stress-related symptomAOs.

Therapeutic Gardening and Veterans

Lehmann et al. (2018) discovered that gardens provided a haven for veterans in the VA SARRTP. The veterans in the program were diagnosed with anxiety disorders, mood disorders, and trauma- and stress-related disorders like PTSD. Participants engaged in passive and active gardening while in the program and continued to visit the gardens to engage in these gardening activities on their own volition. Some of the activities included looking at and monitoring the growth of the plants or vegetables, sitting, relaxing in the garden to pass time or to reduce stress and avoid any hospital stimuli, and harvesting the vegetables to incorporate as a part of their meals or snacks. Findings from group interviews conducted among veterans from the SARRTP revealed that gardening as a treatment modality is both "effective and practical for veterans needing care from severe physiologic and psychological problems" (Lehmann et al., 2018, p. 53). By enabling a vulnerable population like veterans to accomplish greater engagement, build their confidence, and learn new skills or improve the skills they already have, therapeutic gardening can enhance their quality of life, as well as their physical, mental, and social health and well-being.

Conclusion

There are numerous studies that investigate the issues veterans face which consequently impairs their ability to participate in meaningful activities. Research shows that therapeutic gardening is an effective intervention for various mental health conditions that are common among the veteran population. Our study investigated if the veteran population receives benefits and promotion to their individual well-being and quality of life from therapeutic gardening. Therefore, further research should continue to

examine the effects of therapeutic gardening, specifically on the veteran population, which is what this project aimed to do.

Statement of Problem

It is necessary to explore treatment options to provide care to military veterans as they are a vulnerable population that is underserved (Cogan et al., 2018; Rossiter et al., 2018). Many of these mental and physical conditions interfere with their ability to reintegrate into society. The development of physical trauma such as a TBI, limb loss, or burns, may occur while in combat (Waszak & Holmes, 2017). As a result, these individuals may no longer be able to perform their daily tasks or activities. Medical and psychotherapy are familiar treatments often of service to this population for management of symptoms (Poulsen et al., 2016). However, there is a need to utilize other interventions that involve a holistic approach to not only improve their symptoms but provide skills to engage and reintegrate into the community. According to the Occupational Therapy Practice Framework-III by the American Occupational Therapy Association (AOTA; 2014), OT interventions facilitate the engagement of meaningful occupations that can create opportunities to participate in desired situations such as interpersonal relationships, gainful employment, and activities of daily living. The use of gardening as a therapeutic intervention employs strategies that aid in promoting the skills needed for meaningful occupational engagement.

Statement of Purpose

The purpose of this qualitative research project was to support the use of therapeutic gardening as an intervention to improve quality of life for veterans. We conducted semi-structured interviews to gain perspectives of those individuals that run

therapeutic garden programs and veterans who have benefitted from therapeutic gardening. In addition to the benefits, we explored the barriers faced with the implementation and maintenance of a gardening program for therapeutic use. We recruited participants with the use of a flyer sent by email and word of mouth.

There was a twofold purpose to this study. First, we aimed to gain evidence, review outcomes, and consider how therapeutic gardening affects veterans. Second, we explored the barriers and benefits that are involved in the implementation and maintenance of a gardening program for therapeutic use. The process to gain evidence included a recruitment period, providing semi-structured interviews, and reviewing information to clarify or add any additional responses when meeting with participants for a second time. Then we gathered data from all interviews to identify any trends in data.

Theoretical Framework

We used the Person-Environment-Occupation model to design this study. This model explores how an environment influences the ways in which an individual engages in everyday occupations (Cole & Tufano, 2020). This occupational theoretical framework focuses on the dynamic interrelationships between the individual, the different contexts within their environments, and the activities and tasks that are performed through different social roles. Using this model helps to focus on how this collection of factors can be successfully harmonized to improve occupational performance and engagement for any individual.

Person

The person component of this theoretical framework revolves around three domains: physical, cognitive, and affective. The physical component looks at the

individual's physical strength, flexibility, endurance, pain, and range of motion (Cole & Tufano, 2020). The cognitive component includes the individual's thinking, reasoning, memorization, perception, processing, and communication skills. The affective component involves the individual's feelings, emotions, and attitudes towards themself, their environment, and their functionality, and how these aspects of a person can influence their motivation, self-concept, social relationships, and overall occupational performance. Together these domains help a person define who they are, the roles they hold, and the occupations they want or need to engage in. The person focuses on what the individual is able to do, what the individual wants to do, and how the individual can adapt, adjust, make changes, and learn the skills needed to best achieve personal success within the interactions of their environment. Each veteran possesses unique interests, desires, roles, and varying skills that will influence how they engage in an occupation when placed in different environments.

Environment

The environment component in this model is where the client performs the occupation, which may also have an influence on a client's engagement and participation (Cole & Tufano, 2020). The environment can either be physical, social, cultural, or institutional. Physical environments would include various gardens such as outdoor/indoor gardens, and urban community gardens. Social environments would include family, friends, and community members. Cultural environments would include political, ethnic, and religious factors. Institutional environments would include the rules within the veteran facilities, or the laws veterans must obey within society. It can also

include their access to healthcare through veteran affairs. These environments can either be a barrier or an opportunity for veterans to engage in an occupation.

Engagement and participation within the environment also involve a person's personal, temporal, and virtual contexts (AOTA, 2014). Personal context refers to the veteran's age, gender, and socioeconomic class. They all have different backgrounds and may experience different contexts that influence their occupational performance. Temporal context is the time of the year or stage of their lives. Veterans may be at different stages of their lives following their service. Veterans that have recently finished service as well as those that have served decades ago may have different roles and challenges. Virtual context is the use of technology such as cellphones and computers. For example, older veterans may not know how to use new technology which can help them gain access to services and social support.

Occupation

The last component of the PEO model is occupation, which consists of the daily activities or tasks a person needs, wants, or is expected to do. The different categories of occupation include activities of daily living such as dressing and bathing. Instrumental activities of daily living are another category that consist of activities like meal preparation and handling finances. Other areas of occupation include self-care, leisure, productivity, and rest/sleep (Cole & Tufano, 2020). Occupations are unique and have a particular meaning to each individual. When individuals participate in activities that are important to them, they feel "personal satisfaction and fulfillment as a result of engaging in them" (AOTA, 2014, p. S5). However, veterans returning from service or who have served decades prior may experience challenges that prevent them from engaging in

meaningful and purposeful occupations within their communities. The main goal of the PEO model is to achieve optimal occupational performance (Cole & Tufano, 2020). Therefore, by helping the veteran population overcome the problems that hinder their occupational performance, the goal of this framework is to facilitate their active participation in valued activities or occupations and enhance their quality of life.

How the PEO Model Relates to This Project

One of the goals of this project is to understand how the environment affects the veteran's ability to engage in their occupations. This project looked to identify how a garden environment can help to enrich a veteran's perception of their overall well-being, with the hopes of advocating for the use of therapeutic gardening as a service to support the veteran population. Pálsdóttir et al. (2014) found that following a nature-based vocational rehabilitation program, participants on work sick leave reported that their everyday occupations were performed at a slower pace. Social participation also improved as a result of the program that incorporated passive and active aspects of gardening. Adapting the physical environment and occupations to include gardening and improve the person as they relate to the veteran population is important to investigate.

Methodology

Agency Description

We were responsible for the distribution of the flyers and administration of interviews on behalf of Stanbridge University. Stanbridge University provided a Zoom account to conduct the interviews via Zoom.

Project Design

The purpose of this qualitative study was to explore the current trends, theories, and applications associated with passive and active therapeutic gardening, and to consider the ways in which they affect the quality of life of the veteran population. We also wanted to examine the different benefits and barriers that are present within the implementation, maintenance, and participation of gardening programs for therapeutic purposes. Information for this project was collected via semi-structured interviews that were conducted after having gone through the recruitment process by utilizing convenience sampling. Semi-structured interviews are less intrusive as this format encourages two-way communication and allows for in-depth and open-ended responses from participants about their personal perspectives and experiences (Lysack et al., 2017). Due to strict COVID-19 restrictions, interviews were conducted through Zoom and recorded. Each interview was saved to a password protected drive to avoid the risk of recordings being uploaded to the Cloud. The interviews lasted about one hour for each of the three participants. There were two questionnaires that have been approved by the Stanbridge University Institutional Review Board (IRB; see Appendix C and Appendix D). The first questionnaire was for the individuals who have established or are currently running a therapeutic gardening program, and the second questionnaire was for the veterans who are currently or have previously engaged in gardening. The first questionnaire provided insight into the background, experiences, and views of therapeutic garden professionals, and the benefits and challenges associated with therapeutic gardening. The second questionnaire was designed to explore the participants' views on gardening and how it may have impacted their personal and professional lives.

Population

An objective of this study was to gain insight on the effects of therapeutic gardening on the veteran population. We recruited two populations—veterans and professionals. The inclusion criteria for the veteran population included veterans who have participated in gardening of all ages, gender, disability, and/or military branch. The inclusion criteria for the professional population included program directors, occupational therapists, and other therapists who use gardening as an intervention in their practice. The exclusion criteria for both populations included individuals who have not participated in gardening.

Recruitment Procedures

Participants were recruited through convenience sampling. IRB-approved flyers (see Appendix E) were emailed to health care facilities with gardens, local community gardens, and posted in online forums directed to veterans and professionals who have experience in running a gardening program as an intervention.

Storage and Analysis Methods

Once the participants were identified through the recruitment process, we obtained their informed consent. Interviews were audio recorded to be transcribed and the triangulation method was used to further confirm with participants that their answers were accurate and reflected their opinions. Triangulation was utilized by having two raters agree on the conceptual labels and then coded our themes. A second Zoom interview was conducted with the participants to confirm their answers to the interview questions. Then we identified themes using the answers from the interviews. All

interview materials were stored in a password protected drive only accessible to us. These materials will be destroyed one year after completion of the study.

To analyze the data, we used the general principles of data management and analysis for qualitative data as outlined by Peacock and Paul-Ward (2017). These procedural components included active reading, index codes and conceptual labels, analytic memos, and a code directory. The active reading process of the interview transcripts was performed by us to make analytical notes of important themes identified. These analytical notes served to organize our thoughts and interpretations about the data we collected. They also facilitated our discussions as researchers when analyzing the information provided by the participants of our study. Conceptual labels were created as short words or phrases to describe passages of the transcriptions in a categorical manner and provide a framework for our codes. Our codes were created to provide clear operational definitions for the themes we have found. We used the qualitative data analysis software Dedoose to organize our code directory. As there are four people working on this project, we met routinely to discuss the themes identified through the analysis process. These themes described the benefits as well as the barriers of therapeutic gardening to guide our coding.

Project Finalization

The results of our qualitative study will be presented in the form of a poster. We will display our poster at a local community garden for veterans and professionals so they can view the information on gardening as a therapeutic tool. We will also be presenting our poster at the 2021 Occupational Therapy Association of California Annual Conference and Innovation Expo.

Ethical and Legal Considerations

Our research proposal was reviewed as a full board study through the Stanbridge University IRB, as our participants are listed as a vulnerable population. Once we received approval through IRB through application number MSOT10-14 (see Appendix F), we sent out our recruitment flyers to begin our study.

Informed Consent and CA Experimental Subjects Bill of Rights Forms

Both an electronic informed consent form (see Appendix A) and the California Experimental Subjects Bill of Rights (see Appendix B) were sent to participants to review before taking part in the study. Participants were informed that their involvement in the study was voluntary, and they were able withdraw from participation at any time. A request for the participants' consent to be audio-recorded was included in our consent form.

Risks and Benefits

The risks of this study to the participants were minimal. The participants of our study included professionals that employ gardening for therapeutic use as well as veterans that participate in gardening therapies. The interview questions for the veteran participants led into discussions about their personal experiences, which may reflect traumatic events during and after service, and might cause emotional and psychological distress with the vulnerable population. Additionally, the benefits of the study were to gain insight on experiences that may contribute to further research or implementation of gardening as a therapeutic intervention for the veteran population.

Minimization of Risks

To mitigate potential risks, interview questions were carefully worded to prevent emotional duress in participants. All interview questions were IRB approved. We reminded the participants that they were welcome to ask for a break at any time during the interview. Additionally, one of the student researchers (Robert Piacentini) took a certificate course on trauma and trauma informed care and the strategies learned from this course were used throughout the interviews. In the even that a participant experienced emotional duress, an Unanticipated Report Problem was to be submitted to the IRB, and the question was to be analyzed for further use in the study. Interviews were conducted electronically through Zoom and our thesis advisor Dr. Hatala was present for all interviews.

Cost

The cost for the participants was their time taken and efforts used to answer the interview questions we ask them during the study.

Biases

Recruitment flyers were delivered electronically with the request to forward the information to anyone the site may have believed would be interested in utilizing convenience sampling for further recruitment. Our thesis advisor, Dr. Hatala, may have established relationships with potential participants through encounters in the field and speaking engagements on the topic of therapeutic gardening. These factors may have influenced participation in our study.

Confidentiality

All the interview materials were secured in a password protected drive. Moreover, we only referred to each participant and site by a letter and number respectively that de-identified both the participant and site. This information was only accessible to us and Dr. Hatala. All materials will be kept for one year upon the conclusion of the study before being destroyed. Only audio recordings were kept from Zoom interviews, and these recordings were not uploaded to the Cloud.

Results

We posted our flyer to online forums and hand delivered the flyer to veterans and professionals with experience running a community garden program. Three individuals responded—one gardening professional, and two veterans. Once we obtained each participant's informed consent and each participant had signed the California Bill of Rights, we interviewed one gardening professional and two veterans. We found the following themes in the answers from the two veterans we interviewed: social well-being, emotional well-being, gardening as therapy, and exploring new occupations. Time was a theme used to indicate the amount of time spent within a garden. Figure 1 displays the co-occurrence of these themes within the responses of Participant A and Participant C after code analyzation was performed via Dedoose. Due to a low number of participants, the information gathered from the interview with the gardening professional, Participant B, was changed into a case study.

Figure 1

Coding Themes Derived Using Dedoose Software

Media \ Codes	Emotional Well-being	Exploring Occupations	Active Gardening	Passive Gardening	Gardening as Therapy	Social Well-being	Time	Totals
Participant C	1				4			5
Participant C							2	2
Participant C	2	4			1	1		8
Participant C								
Participant C		1		1				2
Participant C		4	4					8
Participant C					1			1
Participant C	4				2			6
Participant A	4				1			5
Participant A		1	1					2
Participant A		1	1		2			4
Participant A						2		2
Participant A		1	1					2
Participant A							1	1
Participant A					1	1		2
Participant A	1							1
Totals	12	12	7	1	12	4	3	

Social Well-being

The theme of social well-being was identified when both veteran participants associated the ways in which gardening has promoted socialization and interpersonal interactions when engaging in the garden. For example, participant C indicated that gardening promotes a “social community” that brings people who are interested in gardening together and encourages others to join. Participant A discussed the positive impact gardening has had on the time spent with their family, as being active in the

garden provides activities for them, their spouse, and their kids to engage in together, allowing for "good bonding time."

Emotional Well-being

Emotional well-being was discovered amongst responses as both participant A and participant C believe that gardening increases an individual's self-worth and confidence as it makes them feel "accomplished" or "rewarded." Participant C revealed that gardening "played a great part in giving confidence again" and it makes them feel "worth something" because they can grow a plant, which is "beneficial to self-worth." Participant A explained how gardening helps them feel "happy and relaxed." Participant A also discussed that gardening has aided in learning about the importance of patience, whether it be with gardening activities, with children, or with personal endeavors, and in this sense, a positive impact of gardening was seen in all aspects of life.

Gardening as Therapy

The theme of gardening as therapy was identified when both participants explained that they were able to apply their learning experiences from gardening to other areas of their lives. For example, participant A explained that after having learned that they need to "slow down and enjoy" the process of growing their vegetables, they found that they could "try to apply [that understanding] to other aspects of life" and know that everything else should be taken "just one day at a time." Participant C emphasized that gardening is therapeutic because it allows individuals "who have been through traumas" or "who are really having a difficult time mentally or physically, feel like they are accomplishing something with their lives." Additionally, participant C described gardening as therapy as they viewed it as a way to connect with another "life source,"

which can guide others to “feel like they are helping some other life.” Participant C further explained that gardening can be therapeutic for individuals “who are not really moving around much” to help in “bringing [them] out in the sunshine.”

Exploring New Occupations

Both veteran participants identified varying ways in which gardening has helped in providing exposure to new and desirable activities for themselves and other veterans. For example, participant A described how they have figured out that they need to “try different things” when gardening because it helps them to problem-solve and find ways that best help their garden in producing vegetables. Additionally, participant C explained that showing others, specifically veterans, how to garden, what they can garden, and having them see the results they can produce from gardening, can provide them with feelings of accomplishment. Doing so may encourage consistent participation and give them the opportunities for “something to do” since they may be at that age where “their children are gone; their grandchildren are probably grown” so nurturing plants would be “good for them.”

Gardening Professional Case Study

Participant B has been a horticulture therapist for about 30 years. They considered gardening to be a therapeutic tool, though they did not always use it as such, and believed that “anything that keeps your mind and hands busy is a therapeutic tool.” Participant B viewed gardening as a way to help motivate people to learn new things, as well to give people the opportunity to nurture something that is growing and living.

Participant B stated that they have seen a variety of diagnoses with their clients, including quadriplegics, those living with severe mental health conditions, those who are

blind, and those who have suffered from strokes. They mentioned the use of adaptive devices, such as one arm pruners. This specific device was beneficial for stroke patients who could only use one arm but were able to perform a variety of activities within the garden due to the availability of the adaptive device within the garden. They explained that when working with quadriplegic clients, they have utilized different adaptive tools to help them engage in gardening activities so that they are able to participate within the garden, since these specific individuals no longer could use any of their limbs. For those with vision impairments, they taught them how to cut tall plants with safe cutters, which they explained provides them with positive tactile experiences that allowed them to try and "feel their way along" the garden. Participant B went on to discuss a specific quadriplegic client who was able to help in planting a whole tomato crop by picking seeds, planting seeds, and watering the plants with an adaptive tool. This process "made a big difference in his life," and helped this individual feel as though he was able to contribute something to the garden. Participant B further discussed how they saw that patients like these were often "stuck in bed with nothing sensory," so providing them with active engagement brought excitement to their lives, an outlet from being bedridden, and created inspiration for other clients. The different activities their clients engaged in within the garden include pruning, trimming, cutting, picking, as well as creating gifts from products of the garden for others. They stated that they always ensured to find different activities for different clients to keep them engaged.

When asked about the challenges associated with implementing a gardening program, participant B explained that many of the challenges arise from infrastructure, such as ensuring that flat surfaces are available for elderly individuals. Other challenges

mentioned were having to ensure that the garden is well equipped with the appropriate equipment and environment, such as “having enough water hoses,” “enough sidewalks for people with wheelchairs,” “enough adaptive tools,” and places “where people could get up and down off the ground to plant.” Participant B also explained the precautions that need to be taken when considering a gardening program, such as being aware of the different plants, and ensuring the gardening professionals are knowledgeable of any plants that can cause adverse reactions. They explained one incident in which a client chose to taste a dracaena plant, thinking it was a sugar cane, which doing so eventually caused the client’s tongue to swell. This incident helped participant B to understand that gardening professionals must always be vigilant when clients engage in the garden, as one may never know what they might do while in the garden. Other considerations mentioned include having enough equipment so that clients have enough opportunities to participate in activities within the garden, as opposed to just standing around. Participant B learned from many incidents that some clients will stand around and not do anything, which eventually influences other clients to stop their activities and stand around the garden as well. In participant B’s opinion, it is important to “have enough work to keep all of them doing something.” They mentioned that this can be done by assigning the clients into groups with one another, assigning them roles, and having the clients work with each other so that everyone can participate, engage, and experience benefits from the garden.

Participant B expressed that everyone may benefit from engaging in therapeutic gardening because it is an activity that can “remove those troubles from your head and focus on a task that can keep you busy and keep you off those troubles.” The therapeutic

outcomes seen with gardening are their clients felt more confidence in their abilities. They reported that clients have described gardening as a stress-free and time-efficient activity, and one where participants felt like there was no pressure on how much they wanted to engage in the garden. No one was giving them orders, which made participants more engaged. And once they saw what they have grown, it changed their perspective.

A therapeutic garden is not a standalone approach, as with some clients—for instance, psychiatric patients—they may need their medications to stabilize themselves. Participant B did not specify the number of sessions when asked when they would see these expected outcomes to occur. However, they mentioned that when clients can compare themselves to others, like his psychiatric patients seeing his quadriplegic patients gardening, they would think “I’ve got these abilities maybe I’m not using as much as I could.” On the other hand, there were psychiatric patients that looked at other patients who are not engaging in meaningful activities and think “Well, I don't have the abilities they have, but at least I have a good functioning mind that I don't have to worry about being depressed and being sad about things that I can't do because I'm doing things that are good for me and everybody else.” They were able to see a difference within themselves and recognize how gardening has impacted them without having someone telling them. The participant ended interview saying that gardening is tool that can be used for participants to get away from their troubles “and into a different groove where they can kind of look at things maybe in a little different light and at least absolve themselves from the miseries they’re having at that time.”

Discussion

This study was developed to gain an understanding of whether gardening as a therapeutic intervention was beneficial to veterans. It was also our objective to explore the barriers and benefits faced with the implementation and maintenance of a gardening program for therapeutic use. Based on the interview with the gardening professional, the challenges and precautions typically involved with implementing a gardening program relate to infrastructure, appropriate set-up of the garden, and the types of plants that are kept within the garden. Though further research needs to be conducted, these are aspects of a gardening program that should be kept in mind when choosing to implement a gardening program for therapeutic purposes.

The results found four common themes among the veterans: social well-being, emotional well-being, gardening as a therapy, and exploring new occupations. The results support that gardening is a viable option to introduce as a therapeutic intervention and can be a new occupation for veterans with benefits to many aspects of their well-being. The gardening professional mentioned that they have seen therapeutic gardening help veterans with a greater well-being—increased confidence, perception of less stress, and keeping them productive and engaged. There was also a consistency in what both the veterans the gardening professional reported as the benefits of working in a garden. The overlap between the veterans and the gardening professional supported the assertion that implementing a therapeutic gardening program can be beneficial for veterans.

Having passionate individuals to introduce others to gardening as a new occupation can provide a space and knowledge to participate and explore. This could be through gardening professionals, family, or others in the community that our participants

identified as those that enabled them into participation. Encouraging and allowing others to participate can show them that gardening does not have to be laborious and can be enjoyed at any capacity in which they desire. Success is largely measured by how it makes you feel. The product of growing flowers or vegetables is not necessarily the goal of utilizing gardening as therapy, although the sense of pride and accomplishment should not be discounted as part of the therapeutic process. The learning process and engagement in gardening activities are where many of the values lie.

Occupational therapists can utilize components of gardening that are meaningful to their clients to engage and promote social opportunities that they were previously unaware of. It can facilitate co-occupations with others to collaborate on projects or even provide consumables for others. One participant identified that having too much of a certain vegetable allows them to bring it to friends, family, or even the less fortunate, thus also giving a sense of purpose and emotional well-being.

Limitations

This study was not without limitations. One limitation of this study included a lower number of participants than expected. Many sites were not operational due to the COVID-19 pandemic, which may have contributed to limited responses to the recruitment flyer. Additionally, our preferred method of performing in person interviews was not possible due to COVID-19 precautions and the unavailability of sites. We felt that interviewing our participants in their garden environments may have enhanced the experience and provided further insights as they engaged with their desired occupation.

Another limitation was the potential for participant bias. We utilized semi-structured interviews with open-ended questions to allow them to be candid with their

responses and reduce the chances that they would provide us with those that they felt we would want to hear. Allowing them to elaborate on their answers to our questions was another way in which we intended to corroborate their true experiences and opinions.

Conclusion

With the development of this project, we hoped to gain a better understanding and investigate how gardening can be beneficial based on the perspectives of both veterans and professionals who implement gardening as a therapy, as well as explore any barriers encountered. Future research can use these findings to further investigate the therapeutic and occupational benefits of gardening for the veteran population, and also how gardening programs can best be implemented within the field of OT.

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Appendix A

Stanbridge University

RESEARCH INFORMED CONSENT FORM

Study Title: The Impacts of Therapeutic Gardening: Perspectives from Veterans and Professionals

Principal Investigator: Dr. Annette Hatala OTD, OTR/L

Student Investigators: Robert Piacentini, Jemma Bolaoen, Patricia Arabaca, Gabriella Sehwani

Funding Source(s): Stanbridge University

This consent form provides the information you will need to understand why this research study is being carried out and why you are being invited to participate. It also describes what you are being asked to do, any known risks, discomforts, and potential benefits that you may have from participating in the research. Please ask questions at any time. If you choose to participate, you will be asked to sign this form. We will give you a copy of this form to keep, and it will be a record of your agreement to participate.

PURPOSE AND BACKGROUND

You are invited to participate in a research study to learn more about experiences with different aspects of gardens or treatments for the researchers to gain an understanding about how this may affect individuals, specifically veterans. We are attempting to gain evidence about how gardening could or could not be used in different ways in treatment and therapies. You are being asked because you have been involved in gardening in a way that will help contribute to the research being conducted.

PROCEDURES

If you agree to be in the study, you will be asked to participate in two interview sessions. The first will be to ask questions and the second interview will be to confirm the information and ask if you have any additional comments. Each interview will last approximately 60 minutes. During the interviews, you will be asked about your experiences with different aspects of gardening, nature, and treatments. The interviews will be audio-recorded, and the researchers may take additional notes.

RISKS

Some of the questions asked may make you uncomfortable or upset. You may choose not to answer any question or to stop your participation at any time. You may ask for as many breaks as you wish. If you feel distressed for any reason during or after the interviews, let the researchers know immediately so we may assist you for help.

BENEFITS

There will be no direct benefit to you from participating in this study. However, the information that you provide may help facilitate further studies that involve aspects of gardening as treatment to help other individuals.

CONFIDENTIALITY

We will make reasonable efforts to safeguard your privacy and confidentiality. Any identifiable information obtained during this study will remain confidential and disclosed only with your permission. Only members of the research team may access the data collected.

Your name will not be used in any publications which result from this research unless you provided permission for this (remove if not applicable to your study). Per federal regulations, data will be kept for three years and then destroyed.

PAYMENT/COMPENSATION

There will be no compensation for participation in this study.

PARTICIPATION IS VOLUNTARY

You do not have to be in this study if you choose not to. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits to which you are otherwise entitled.

FUTURE STUDIES

Would you be interested in being contacted and participating in future studies? This would require us to keep your contact information to reach out should one become available.

Yes _____ No_____

_____ _____

Printed Name of Participant	Signature of Participant

Signature of Researcher Obtaining Consent	Date

Appendix B

Stanbridge University

EXPERIMENTAL RESEARCH SUBJECTS BILL OF RIGHTS

Experimental Research Subjects Bill of Rights California Law, under Health & Safety Code 24172, requires that any person asked to take part as a subject in research involving a medical experiment, or any person asked to consent to such participation on behalf of another, is entitled to receive the following list of rights written in a language in which the person is fluent. This list includes the right to:

1. Be informed of the nature and purpose of the experiment.

2. Be given an explanation of the procedures to be followed in the medical experiment, and any drug or device to be utilized.

3. Be given a description of any attendant discomforts and risks reasonably to be expected from the experiment.

4. Be given an explanation of any benefits to the subject reasonably to be expected from the experiment, if applicable.

5. Be given a disclosure of any appropriate alternative procedures, drugs or devices that might be advantageous to the subject, and their relative risks and benefits.

6. Be informed of the avenues of medical treatment, if any, available to the subject after the experiment if complications should arise.

7. Be given an opportunity to ask any questions concerning the experiment or the procedures involved.

8. Be instructed that consent to participate in the medical experiment may be withdrawn at any time and the subject may discontinue participation in the medical experiment without prejudice.

9. Be given a copy of the signed and dated written consent form.

10. Be given the opportunity to decide to consent or not to consent to a medical experiment without the intervention of any element of force, fraud, deceit, duress, coercion, or undue influence on the subject's decision.

SIGNATURE OF RESEARCH PARTICIPANT

I have read the information provided above. I have been able to ask questions about the research. The researchers have answered my questions to my satisfaction. I agree to participate in this study. I have been given a copy of the CA Experimental Subjects Bill of Rights.

_____

Name of Participant

_____ _____

Signature of Participant Date

SIGNATURE OF INVESTIGATOR

I have explained the research to the participant and answered all of his/her questions. In my opinion, the participants willingly agree to participate in this study. They also understand that participation is voluntary and that they may discontinue their participation in the study at any time, for any reason.

_____

Name of Investigator

_____ _____

Signature of Investigator Date

Appendix C

Stanbridge University

THERAPEUTIC GARDEN PROFESSIONAL INTERVIEW QUESTIONS

1. What is your professional background?
2. Have you ever used gardening as a therapeutic intervention? When did you begin to use gardening as therapeutic tool?
3. What diagnoses have you seen with your clients?
4. What kind of activities do your clients engage in within the garden?
5. What have been your challenges with implementing a gardening program?
6. Would you suggest any specific precautions when considering a gardening program?
7. Which clients do you believe benefit from gardening? Why? And how?
8. What were the outcomes for your clients after gardening?
9. Do you use therapeutic gardening as a standalone approach or as complementary therapy?
10. How many sessions with gardening do you see clients obtaining outcomes?
11. Do you have anything else you would like to add?

Appendix D

Stanbridge University

VETERAN INTERVIEW QUESTIONS

1. How many hours do you spend gardening each week?
2. How did you become interested in gardening?
3. What kind of activities do you do in your garden?
4. How does gardening make you feel?
    a. What are the aspects of gardening that make you feel this way?
5. What have you learned from gardening? Are there ways in which you apply what you've learned in everyday life?
6. Would you consider gardening as therapeutic? Why or why not?
7. What could be done to encourage your participation in gardening?
8. Could you explain how gardening can be beneficial to other veterans who might be interested?
9. Do you have anything else that you would like to add?

Appendix E


Do you implement gardening with your clients?
Are you a veteran and enjoy gardening?
We are looking to interview:
• Individuals who have established or are currently running a gardening program.
• Veterans who enjoy gardening.
Interviews will be conducted over Zoom.
For more information
Please contact Annette Hatala at ahatala@stanbridge.edu
STANBRIDGE UNIVERSITY

Appendix F

04/13/2021

Re: IRB Application Number MSOT10-14

Dear Dr. Hatala and Students,

The Stanbridge University Institutional Review Board has completed a review of your application entitled, “The Impacts of Therapeutic Gardening: Perspectives from Veterans and Professionals" Your research protocol MSOT10-14 is fully approved and categorized as full board.

Should you wish to modify this approved protocol, please submit a modification request.

Sincerely,

Dominique N. Wascher

Dominique N. Wascher, Ph.D.

IRB Chair