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Eastern Kentucky University

Making the Comeback from Combat: An Analysis of the Effectiveness of Occupational
Therapy for Combat Veterans

Honors Thesis

Submitted

In Partial Fulfillment

of the

Requirements of HON 420

Spring 2021

By

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Making the Comeback from Combat: An Analysis of the Effectiveness of Occupational
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Abstract

Combat veterans have been found to experience difficulties with community reintegration after coming back from their deployments. Many of them experience physical and mental injuries from their deployment, such as mild traumatic brain injury, post-traumatic stress disorder, and amputations. Combat veterans not having effective treatment for these injuries can contribute to issues with community reintegration. These issues can consist of marital and financial problems, problems with alcohol or substance abuse, homelessness, and motor vehicle accidents. The Department of Veterans Affairs and the United States military have put forth efforts with improving community reintegration for combat veterans; one of those efforts is better utilizing the profession of occupational therapy. Occupational therapy provides a holistic approach to combat veterans with mild traumatic brain injuries, post-traumatic stress disorder, and amputations and has been shown to have several beneficial interventions when working with this population. The objective of this systematic review is to analyze the effectiveness of occupational therapy interventions on combat veterans experiencing difficulties with community reintegration.

Key words and phrases: combat veterans, community reintegration, military, occupational therapy, systematic review, mild traumatic brain injury, post-traumatic stress disorder, amputations, United States

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Introduction

Background and Need

As one could imagine, going through combat can be a completely unique mental and physical experience, one that most people will not go through in their lifetime. Going through elongated periods of time feeling on edge, always having to prepare for potential death or injury. These are thoughts that only a small population of the United States has to go through, and that population consists of combat veterans in the United States military. About 7.6 percent of the population in the United States is made up of veterans, which consists of around 18.8 million people (Planning, 2019). As of 2019, there was estimated to be around 14.9 million wartime veterans in the U.S. population. Combat veterans can often go through traumatic experiences while deployed during wartime, which can lead to several difficulties for them in their post-deployment life. Many experience difficulties with traumatic brain injuries (TBIs), Post-Traumatic Stress Disorder (PTSD), amputations, depression, and anxiety.

With combat veterans being a smaller population in the United States, they often are overlooked, and their difficulties go untreated. This has led to a large issue in the veteran community, as many combat veterans throughout time have experienced complications with community reintegration. Community reintegration is a term often used for veterans who are returning home from deployment, a time where they are separated from their normal community living and return to their community life and major social life roles (Resnik, 2012). Many veterans who have TBIs, PTSD, anxiety, and/or depression that stems from their combat role are often at risk to experience marital and financial problems, problems with alcohol or substance abuse, homelessness, and

motor vehicle accidents when returning to their community life (Resnik, 2012). After many years of recurring complications of community reintegration in the combat veteran population, the U.S. Department of Veterans Affairs as well as the U.S. Military have attempted to put forth efforts to help this issue. One of the efforts that have been used to help this is utilizing the profession of occupational therapy to help combat veterans in the United States military with being able to adjust to their new reality and having a better sense of community reintegration.

In this study, combat veterans are defined by the Department of Veterans Affairs (2020):

Anyone who has served in a United States Armed Forces branch and experience[d] hostilities of any level or take[n] part in an action of enemy combatant for certain duration as a result of friendly, defensive, or offensive fire military action that involves a perceived or real enemy in a post or pre-determined combat proceeding (paras. 3).

Problem Statement

The problem this research seeks to address is how the difficulties combat veterans experience from mild traumatic brain injuries, post-traumatic stress disorder, and amputations prevent them from effectively reintegrating back into their communities.

Statement of Purpose

The purpose of this systematic review is to analyze the effectiveness of occupational therapy on combat veterans in the United States military and how it affects their ability to reintegrate back into their communities after experiencing mild traumatic brain injuries, post-traumatic stress disorder, and amputations post-deployment.

Research Question

What is the effectiveness of occupational therapy interventions on combat veterans' ability to reintegrate back into their community after experiencing mild traumatic brain injuries (mTBIs), post-traumatic stress disorder, and amputations?

Thesis Statement

Occupational therapy interventions will have a positive effect on combat veterans' ability to reintegrate back into their community after experiencing mild traumatic brain injuries, post-traumatic stress disorder, and amputations.

Literature Review

Occupational Therapy

Occupational therapy is one of several of the professions in the allied health field. According to the Association of Schools Advancing Health Professions (2020), allied health is defined as:

encompassing a broad group of health professionals who use scientific principles and evidence-based practice for the diagnosis, evaluation and treatment of acute and chronic diseases; promote disease prevention and wellness for optimum health, and apply administration and management skills to support health care systems in a variety of settings (paras. 1).

The allied health field makes up around 60% of the healthcare field, each profession providing their own, specific touch. Several of these allied health professions include physical therapy, speech language pathology, physician assistant, and occupational therapy. According to the Occupational Therapy Practice Framework: Domain and Process Fourth Edition, occupational therapy is defined as “the therapeutic use of everyday life occupations with persons, groups, or populations for the purpose of enhancing or enabling participation” (AOTA, 2020). Occupations are typically everyday activities that people do as individuals or in a group to occupy their time and bring purpose to their life. Examples of occupations could range from something as simple as brushing one’s teeth to something more complex like running a marathon.

History of Occupational Therapy within the Military

Occupational therapy has a significant history within the United States military, dating all the way back to World War I. Occupational therapy achieved a decent amount

of development due to its role in World War I, as there was a strong relationship between orthopedists and reconstruction aides at the time. Before the United States had even joined the war and developed this program, England had already developed reconstruction programs to allow disabled soldiers to go through orthopedic rehabilitation to continue their military duty, or to where they are able to participate in civilian employment if they are discharged (Gutman, 1994, pg. 257). Eventually, England's reconstruction programs were led by occupational therapists and physiotherapists because of a lack of orthopedists.

During World War I, Harvard orthopedists, Joel Goldthwait and Elliot Brackett, were tasked with creating a reconstruction program for disabled soldiers for the Medical Department of the Army in the United States (Gutman, 1994). Goldthwait and Brackett based their program around the ideas of England's reconstruction program, explaining to the Surgeon General that orthopedic services could help allow the soldier return to their military assignment. This was a better plan compared to the alternative, which was discharging soldiers' and having them rely on pension for the rest of their lives; something that was also becoming a burden on the United States economy. The orthopedists argued that they were trained "to think of disability in terms of function" and had medical knowledge that allows them to prescribe occupations that disabled soldiers could be retrained to perform (Gutman, 1994), which would make them the most qualified to oversee the reconstruction programs. In 1918, a group of female occupational therapists and physiotherapists, otherwise known as the reconstruction aides, were put into a clinical practice at Walter Reed Hospital. The aides would work with soldiers on activities like woodworking, rug making, knitting, and much more (Quiroga, as cited in

Pettigrew, 2017). Initially, the military did not even want women to fill the positions and originally tried to have men who were less educated and qualified. When women first started working as reconstruction aides at Walter Reed, they were unofficially employed and were not offered rank or commission for their work. Eventually, the need for reconstruction aides became so high that the Secretary of War acknowledged the value and qualifications of the women and allowed the women to officially fill the position.

The influence of orthopedists and World War I has had a substantial influence on the development of occupational therapy; many aspects of it have made it what it is today. Orthopedists created schools for occupational therapy reconstruction training for World War I, which eventually led them to develop curriculum for more occupational therapy schools, with more emphasis on the medical sciences built into the curriculum. The current practice of occupational therapy can credit the women who filled the positions of the reconstruction aides in the military, which helped further define the services offered by occupational therapy today.

The Current Role of Occupational Therapy in Active-Duty Military

Occupational therapy served a large role back when it was developed and refined during World War I, and it still serves a significant role in the active-duty military setting in the present. Military occupational therapists often serve in the inpatient and outpatient settings in the military hospitals, as well as serving in Warrior Transition Units (WTUs) and Combat and Operational Stress Control (COSC) units. WTUs were developed to “house, rehabilitate, and return soldiers to duty to foster a transition from military to civilian life” (Amorelli & Sposato, 2016). Soldiers who have sustained physical or mental injuries from serving and need six or more months of intensive care typically get placed

in this unit, in order to return back to their previous role before their injury. The role of occupational therapy within a WTU is to help soldiers regain occupational performance and achieve mastery in the occupations of their independent living. The therapists often provide more of a functional approach with their clients by matching their interests, skills, and abilities with activities that have purpose and the right amount of challenge (Erickson, 2008).

COSC units' main goals are to enhance service members' stress reactions, to prevent maladaptive stress reactions, to assist soldiers with managing behavioral health disorders, and teaching resiliency skills (Baumann, 2018). To make sure soldiers are getting an effective recovery plan, occupational therapists observe their occupational performance, analyze how a specific task can be demanding to individuals, utilize a therapeutic use of activities, make environmental modifications, get their clients to develop meaning and hope through their recovery process, and match specific individuals to specific tasks to match their abilities. Occupational therapy within the present-day military allows opportunities for injured soldiers to maximize the performance of their life skills, whether it is on or off the battlefield, making it a crucial role of military medical rehabilitation care.

Healthcare in the Military

A significant topic of discussion when veterans are brought up is the healthcare that veterans are provided. The veterans' healthcare system, or better known as the U.S. Department of Veterans Affairs (VA) was initially developed in 1946 and has developed into one of the largest healthcare systems, research enterprises, and provider of graduate medical and other professional training in the United States (Kizer, 1997). It was created

in response to the massive influx of injured soldiers during 1945, near the ending of World War II. Later on, in 1989, the VA became a cabinet level department in the Executive branch. Currently, the VA is the second largest agency in the U.S. government. It serves more than 9.4 million patients throughout 700 military hospitals, as well as through the military insurance plan, TRICARE (Smith, Bono, Slinger, 2017).

One way combat veterans can receive healthcare treatment is through VA hospitals. The VA has been controversial, as there have been positives, as well as negatives pointed out in the public eye for quite a while now. The VA has been widely known for not offering fee-for-service payment. Fee-for-service allows a large volume of services and reimbursed services; however, this does not necessarily mean they provide better care (Atkins, Kupersmith & Eisen, 2010). The VA has often been known for their level of care, as they have a performance measurement system that follows outcomes, system performance, and satisfaction among their patients. It is also known for its diversity of its 153 hospitals, 750 outpatient clinics, and 90,000 providers that continue to serve the sickest and poorest among US veterans. However, the VA has been a topic of discussion because of the constant debate in the United States about the role of the government with healthcare and how far the government should go to offer people healthcare (Kizer, 1997). It is also known for its large back log of benefit claims; many veterans have found it difficult to redeem the benefits of the VA and earn the care they need, which has resulted in deaths of patients for not receiving care fast enough. While the VA has been known for incredible achievements in care and research, they also are quite publicly known for their downfalls.

Another way combat veterans can receive treatment is through the Military Health System (MHS). The MHS “saves lives on the battlefield, combats infectious diseases around the world, and is responsible for providing health services through both direct care and Private sector care to approximately 9.6 million beneficiaries, composed of uniformed service members, military retirees, and family members” (Health.mil, n.d.). There are two main ways that veterans can choose to receive care through the MHS: direct care and Private Sector Care. Direct care is when active duty service members can go to military treatment facilities on bases and posts all over the world, consisting of four different types of facilities: Multi-service markets, medical centers, hospitals, and clinics (Tricare.mil, 2020). Active duty service members can go to these facilities to receive treatment, free of cost. However, some military bases and posts can have limited resources due to the size or location and might not always have the service the combat veteran may need. In this case, combat veterans can receive Private Sector Care through the use of the military insurance plan, TRICARE. TRICARE offers integrated healthcare through military treatment facilities, as well as through networks of civilian providers in the United States and abroad (Health.mil, 2020). It provides healthcare for over 8 million beneficiaries and is one of the largest healthcare organizations in the world, with its main focus on improving access and availability to healthcare services to their beneficiaries (Shelton, 2001).

Assumptions

There were several assumptions made throughout the process of completing this systematic review. The researcher is an occupational science student on the path of becoming an occupational therapist. With these factors being considered, the researcher

is an avid supporter of occupational therapy having a positive impact on the populations it is used with. In the specific case of this systematic review, the researcher believes that occupational therapy would have a positive impact on the combat veteran population in the United States. The researcher assumes that the results from the analysis of the articles included in this review accurately show the benefits of occupational therapy for combat veterans.

Methods

The implementation of the systematic review process was used to investigate the research question. A systematic review “attempts to identify, appraise, and synthesize all of the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question. There are explicit, systematic methods that are selected with a view aimed at minimizing bias, to produce more reliable findings to inform decision making” (Cochrane Library, n.d.). Systematic reviews are most often used for healthcare studies, as it provides a prominent amount of evidence for the effectiveness of different healthcare interventions (Cochrane Library, n.d.). For this systematic review, the effectiveness of occupational therapy interventions on combat veterans is being investigated.

To perform a comprehensive search of literature, the researcher used an electronic search strategy of three different databases. The databases included in this review are Academic Search Complete, the American Journal of Occupational Therapy, and CINAHL Complete. The electronic search was completed using a combination of key words and search terms, as shown in Table 1. To begin the electronic search, the researcher started by entering five (S1-S5) individual key words: “combat veterans,”

“occupational therapy,” “mild traumatic brain injury OR mild tbi OR mtbi,” “PTSD OR post-traumatic stress disorder,” and “amputations OR amputee OR amputees OR limb loss.” The results of the searches with individual key words were too broad.

The researcher continued to narrow the results by combining the key words and search terms in order to find articles more related to the research question. There were three final combinations of key words used in each database in attempt to narrow results. The first combination of key words (S1 and S2 and S3) produced 66 results from Academic Search Complete, 53 results from the American Journal of Occupational Therapy, and 3 results from CINAHL Complete. The second combination of key words (S1 and S2 and S4) produced 61 results from Academic Search Complete, 102 from American Journal of Occupational Therapy, and 20 results from CINAHL Complete. The third combinations of key words (S1 and S2 and S5) produced 25 results from Academic Search Complete, 17 results from American Journal of Occupational Therapy, and 9 results from CINAHL Complete. After narrowing the pool of articles in each of the databases, the researcher continued to narrow down the articles based on their titles, and further narrowed them based on their abstracts, as shown in Figures 1, 2, and 3.

Inclusion Criteria

There was a broad inclusion criterion for this study, as there was a lack of published literature for certain sections of this study. The qualifications of the literature used in this study included veterans who have specifically had combat experiences in the military, experienced psychological difficulties or physical difficulties as a result of their combat experience, and have reported difficulty with reintegrating back into their communities. All of the combat veterans in these studies served in either Operation

Enduring Freedom and/or Operation Iraqi Freedom. All of the studies used were completed in the United States, with the United States military. The use of occupational therapy as an intervention was also a qualification when looking at literature to include in this study. The articles had to be peer-reviewed and published in an academic journal.

Table 1.*Comprehensive Search of Literature Using an Electronic Search Strategy*

Search Term	Academic Search Complete	American Journal of Occupational Therapy	CINAHL Complete
S1: Combat Veterans	346,776	318	325
S2: Occupational Therapy	30,753	9,038	11,856
S3: Mild traumatic brain injury or mild tbi or mtbi	4,315	1,474	692
S4: PTSD or Post-Traumatic Stress Disorder	56,556	2,518	7,851
S5: Amputations or amputee or amputees or limb loss	15,191	736	3,136
S1 + S2	663	172	145
S1 and S2 and S3	66	53	3
S1 and S2 and S4	61	102	20
S1 and S2 and S5	25	17	9

Figure 1.

Chart demonstrating the method of gathering articles for the combination S1 and S2 and S3.

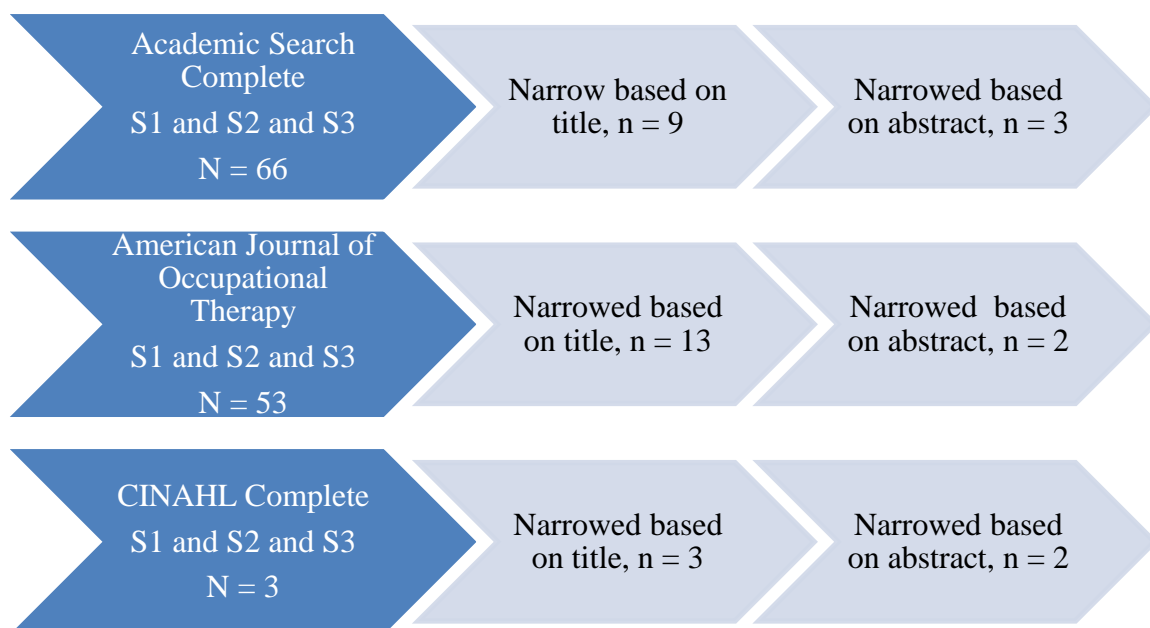


Figure 2.

Chart demonstrating the method of gathering articles for the combination S1 and S2 and S4.

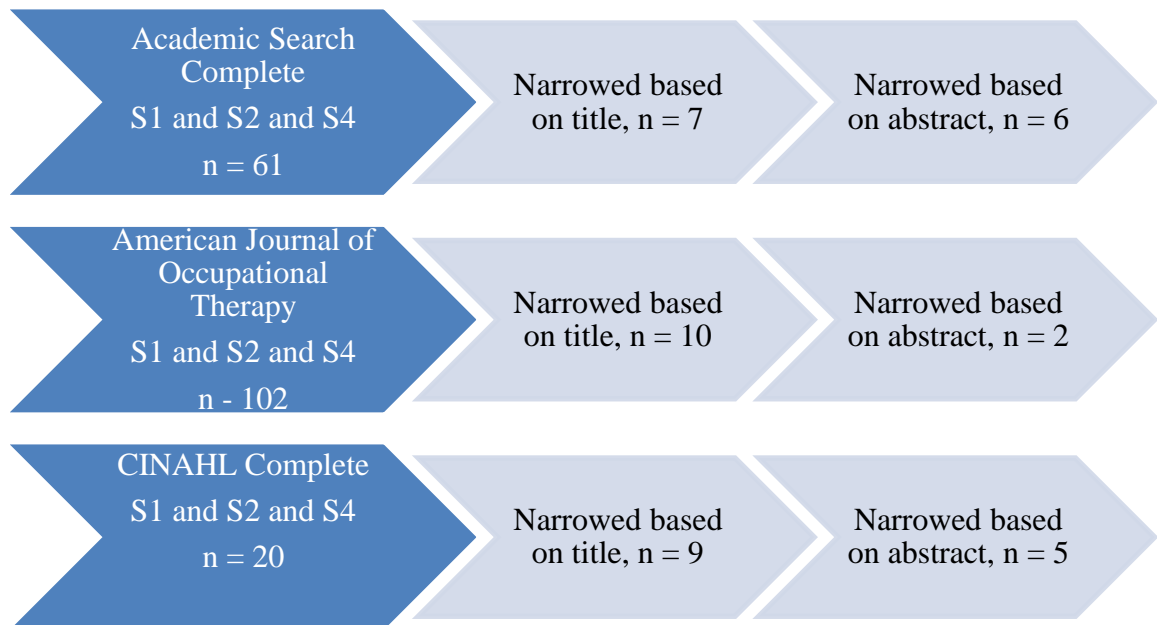


Figure 3.

Chart demonstrating the method of gathering articles for the combination S1 and S2 and S5.

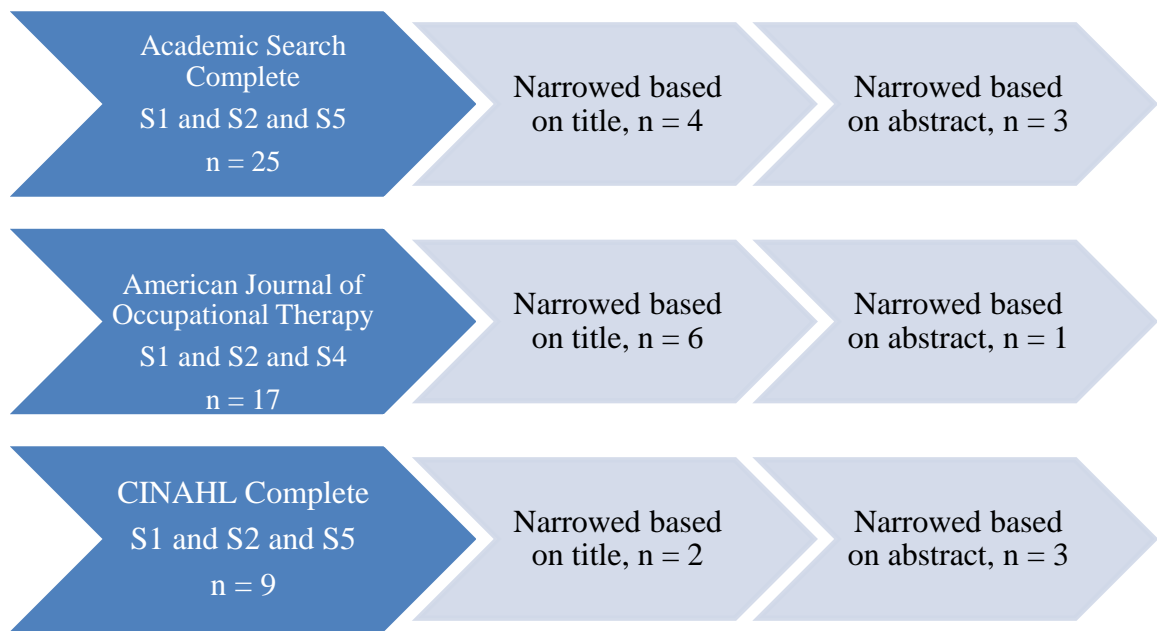


Table 2:*Evidence Table*

Author and nation of origin	Aim of Study	Service Setting	Sample	Methodology	Outcome Measured	Results/ Descriptive themes	Key Findings
Cogan, A.M., Haines, C.E., Devore, M.D., Lepore, K.M., & Ryan, M. 2019 United States	To identify the needs of military service members with chronic symptoms after mild traumatic brain injury that fall within the scope of occupational therapy practice.	Naval Hospital Camp Pendleton	12 male service members	Phenomenological study with semi-structured interviews	Qualitative,	Themes: Occupational changes and plans for the future	Service members with chronic symptoms related to mTBI have needs across the full domain of occupational therapy practice
Speicher, S.M., Walter, K.H., & Chard, K.M.	To examine outcomes of an 8-week residential treatment program for veterans	Midwestern U.S. Department of Veterans Affairs (VA) PTSD	26 male veterans who met criteria for current PTSD and had a	Non-experimental correlational, treatment in a residential PTSD/mTBI program.	Whether occupational performance improved and psychological symptom severity	Quantitative, for COPM variables, performance and satisfaction, CAPS and PCL-S scores, PCL-S and BDI-II	All outcome variables significantly improved over the course of

Author and nation of origin	Aim of Study	Service Setting	Sample	Methodology	Outcome Measured	Results/ Descriptive themes	Key Findings
2014 United States	with PTSD and TBI	specialty clinic	history of mTBI		decreased over the course of interdisciplinary treatment received in residential PTSD-TBI program.	scores, CAPS and BDI-II scores, and psychological symptom severity were positively associated. COPM-S and PCL-S and BDI-II were negatively associated.	residential treatment.
Rogers, C.M., Mallinson, T., & Peppers, D. 2014 United States	To evaluate the intervention for attendance rates and retention in the program provided in 5 sessions over 5 weeks.	Veterans Transition Center Post Deployment Clinic	14 veterans from a specialty post-deployment clinic at a Veterans Affairs hospital.	Pretest-posttest cohort design with five surfing sessions offered.	Attendance rates to the sessions as well as the change in the proportion of participants whose symptom severity was in a clinically subthreshold range before	Veteran participants with PTSD reliably attended program sessions, as well as reports of PTSD symptom severity being significantly lower after the study was completed.	Surfing and other high-intensity sports may be a socially acceptable occupation for veterans with symptoms of PTSD and depression.

Author and nation of origin	Aim of Study	Service Setting	Sample	Methodology	Outcome Measured	Results/ Descriptive themes	Key Findings
					and after treatment.		
Bracciano , A.G., Chang, W., Kokesh, S., Martinez, A., Meier, M., & Moore, K. 2011 United States	To identify the effect of CES on veterans with PTSD.	The Forty and Eight, a local Veterans of Foreign Wars Hall in Omaha, Nebraska.	2 participants who have self-reported PTSD diagnosis and have prior service in any U.S. military branch.	Case study with pretest-posttest design, participants complete 4 weeks of self-administered cranial electrotherapy stimulation	Whether CES has an effect on decreasing the occurrence and intensity of PTSD symptoms in veterans and enhanced their self-perceived performance and satisfaction in daily life activities.	Quantitative; the Daily Symptom Ratings-Treatment Log decreased from a 6 to a 2 in PTSD symptoms, the PTSD Symptom Scale- interview showed a decrease from 34 to 13 and 29 to 2, and the Canadian Occupational Performance Measure had an increase in occupational performance from participant 1 and no change from participant 2.	CES decreased PTSD symptoms in both veterans with PTSD, but only improved the self-perceived performance and satisfaction in daily activities in one veteran.

Author and nation of origin	Aim of Study	Service Setting	Sample	Methodology	Outcome Measured	Results/ Descriptive themes	Key Findings
Cancio, J.M., Orr, A., Eskridge, S., Shannon, K., Mazzone, B., & Farrokhi, S. 2020 United States	To identify preferred OT practice patterns for U.S. military SMs treated in Military Treatment Facilities who have sustained who have sustained various levels of deployment-related UL amputation.	Naval Health Research Center in San Diego, California.	148 total service members; 93 service members with unilateral upper limb amputation distal to the elbow joint and 55 service members with unilateral upper limb amputation proximal to the elbow joint.	Descriptive analysis of billing metrics information to characterize OT practice patterns after upper limb amputation.	The amount of OT encounters within the first year after amputation.	A total of 29,878 OT encounters occurred 12 months after amputation.	Service members with upper limb amputation utilize OT services often within first year after injury.
Melcer, T., Walker, G.J., Galarneau, M.,	To follow the outcomes of warfighters who	Defense Manpower Data Center and the Defense	382 U.S. warfighters in OEF or OIF between	Retrospective review of existing medical and personnel records approved by an	Standard diagnosis and procedure codes for surgeries and	Over two-thirds of amputees used PT, OT, prosthetic/orthotic lab, psychiatric,	Combat amputees used several outpatient clinic

Author and nation of origin	Aim of Study	Service Setting	Sample	Methodology	Outcome Measured	Results/ Descriptive themes	Key Findings
Belnap, B., & Konoske, P. 2010 United States	sustained combat amputations in OEF/OIF between 2001 and 2005.	Enrollment Eligibility Reporting System.	2001 and 2005 who sustained a combat injury causing or leading to a major extremity amputation .	institutional review board.	longitudinal changes in complications, mental health diagnoses, and outpatient clinical use.	and orthopedic clinics at least once within a year after injury.	specialties at high rates soon after injury. Upper limb amputees had higher OT rates in the first year.

Results

After narrowing the search results and extracting data, each set of articles was grouped into three categories: Mild Traumatic Brain Injury, Post-Traumatic Stress Disorder, and amputations. Each of these categories include findings from the articles related specifically to the subject. The findings demonstrate how occupational therapy is effective for combat veterans in the three areas previously listed.

Mild Traumatic Brain Injury

A prevalent difficulty combat veterans experience as a result of their deployments is mild traumatic brain injuries (mTBIs). Radomski (2009) defines mTBIs as the following:

A traumatically induced structural injury and/or physiological disruption of brain function as a result of an external force that is indicated by new onset of worsening of at least one of the following clinical signs, immediately following the event: any period of loss of or a decreased level of consciousness; any loss of memory for events immediately before or after the injury; any alteration in mental state at the time of injury (confusion, disorientation, slowed thinking, etc.); neurological deficits (weakness, loss of balance, change in vision, praxis, paresis/plegia, sensory loss, aphasia, etc.) that may or may not be transient; intracranial lesion (p. 647).

When it comes to mTBIs in a military context, many veterans get them as a result of blast exposures on the battlefield. Since 2001, around 12% of the 1.6 million service members who were deployed during Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) endured mTBIs (Radomski 2009). This was a factor that overloaded the

military's healthcare system, as there were not enough clinicians available to care for all of the new injured service members, with the addition of the everlasting issue of the back logging of benefit claims within this system.

One of the solutions to this issue was the establishment of the Proponency for Rehabilitation and Reintegration within the military, which allowed for advancements in practices, research, and policies when it came to improving care of service members. The development of this program allowed a group of occupational therapists and physical therapists to find out what areas combat veterans were having difficulty with reintegrating back into their community due to their mTBI. Radomski listed several areas where the occupational therapists felt the need to intervene: vision impairments, cognition, emotional well-being, and resumption of life roles (Radomski 2009).

The combat veterans reported the following experiences when it came to the lasting effects of their mTBIs. For visual impairments, combat veterans reported having photosensitivity, oculomotor dysfunction, poor visual acuity, and scanning deficits. Cognitive impairments included limited information processing, difficulties with problem-solving, and impaired self-awareness, which is a result of damage to the prefrontal cortex and frontal lobe from the blasts. On top of visual and cognitive impairments, combat veterans' report experiencing challenges in the resumption of their daily life roles and many occupational challenges.

The specific occupational challenges combat veterans with mTBIs experienced were sleep disruption, difficulty with simple household tasks, difficulty adjusting to a new job, limited social engagement, loss of interest in leisure activities, and struggles with concentrating on educational material (Cogan, 2019, pg. 4-5). The findings of

Cogan's study explains that service members with chronic effects of mTBI have needs throughout the entire domain of the occupational therapy practice. Occupational therapy can be especially effective with rehabilitating service members' activities of daily living, sleep disruption, and supporting the process of transition to military to civilian life. Occupational therapy provides a holistic approach to the plethora of symptoms with mTBIs. However, Cogan states that there is still a need for more studies with occupation therapy interventions for service members with mTBIs.

In Speicher's (2014) study, there was significant evidence of occupational therapy interventions being effective for service members with mTBIs. In this study, 26 male veterans with PTSD and mTBIs participated in an 8 week-long residential treatment. Throughout the 8 weeks, the veterans participated in cognitive-processing therapy, psychoeducation groups, adjunctive treatment, and occupational therapy. The occupational therapy portion of treatment focused on each of the veterans' goals that they developed at the beginning. The therapists used purposeful activities, preparatory methods, and self-directed occupations. (Speicher, 2014). Data was collected at the beginning and end of the program; it was collected through the use of several different assessments and interview processes. The variables being measured were PTSD symptoms, mTBI symptoms, depression, occupational performance, and satisfaction. The results of the study demonstrated that all variables measured throughout the treatment had reasonable improvement. The use of occupational therapy allowed veterans to "safely and successfully engage in their self-identified problematic occupational areas while practicing new skills and compensatory strategies" which improves their overall performance and satisfaction with their performance (Speicher, 2014). The study states

that occupational therapists' knowledge of the cognitive, sensory, emotional, and motor skills that are required to participate in occupations is valuable. Overall, the treatment used in this study was effective for veterans with mTBI and PTSD.

Post-Traumatic Stress Disorder

Combat veterans often encounter a variety of mental health conditions as a result of their combat experience, one of the biggest conditions being Post-Traumatic Stress Disorder (PTSD). PTSD typically develops after experiencing or witnessing an event that presents a potential threat of injury or death. According to the Institute of Medicine (IOM, 2010), symptoms of PTSD can include having “flashbacks and nightmares; avoidance of people, places, and situations associated with the trauma; hyperarousal (difficulty in sleeping and in concentrating and exaggerated startle).” The symptoms should remain for over a month and can occur acutely (within six months after the traumatic event) or delayed (beginning 6 months or more after the traumatic event). In a study done with Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans, it was found that up to 15% of combat veterans show PTSD symptoms when deployed to war zones. That percentage can potentially increase over time, as there have been studies suggesting that PTSD symptoms can increase with time post-deployment (IOM, 2010).

PTSD can bring along a significant number of occupational challenges for those who develop it, often interfering with combat veterans quality of life and their daily functioning. In Plach's study (Plach, 2013), 23% of combat veterans tested positive in their screening for PTSD. They said their main occupational challenges from developing PTSD are driving, self-care, socializing and developing relationships, sleeping, and

school. The American Occupational Therapy Association (AOTA) released a statement acknowledging the severities of combat-related PTSD and how it can impact a person's everyday life and occupations (AOTA, 2009). They stated how it is an "overarching goal of occupational therapy for military personnel coping with combat-related PTSD is to use strategies to help them recover, compensate, or adapt so they can re-engage with activities that are necessary for their daily life" (AOTA, 2009).

There have been a variety of techniques used by occupational therapists to treat the symptoms of PTSD. Speicher used an eight-week residential treatment program for 26 male combat veterans with posttraumatic stress disorder and a history of TBI (Speicher, 2014). Throughout the 8 weeks, the veterans completed several different programs from 8:00am to 4:30pm: cognitive-processing therapy, psychoeducation groups, adjunctive treatment, and occupational therapy. One of the primary goals of Speicher's study was to decrease PTSD symptoms. When veterans participated in occupational therapy, they would focus on the "veteran's unique set of self-identified goals that the [Canadian Occupational Performance Measure] helped to identify" (Speicher, 2014). It was found that occupational performance increased and psychological symptom severity decreased in veterans with PTSD.

Another occupational therapy intervention was Rogers' study (Rogers, 2014). Rogers conducted a study where 14 combat veterans participated in the high-intensity sport of surfing. People diagnosed with PTSD have often shown to participate in risk-taking behavior like speeding or substance abuse, however, it is possible that high-intensity sports can be more socially acceptable risk-taking behaviors. These high-intensity sports can specifically benefit combat veterans, as they can reflect the

athleticism and the physical, psychological, and environmental challenges that the military often poses for them. The purpose of Rogers' study was to see if combat veterans with PTSD will consistently attend all five weeks of the surfing program and if the occupational therapy intervention will decrease PTSD and depressive symptoms (Rogers, 2014). During the five weeks, five different resiliency themes are addressed: Role identity, leadership and trust, community building, problem solving, and transition. The study found that the attendance rates of the five-week program were high at 73% attendance; compared to the usual 30-55% attendance of more traditional mental health interventions. It was also found that PTSD symptom severity decreased significantly after the five weeks (Rogers, 2014). Rogers unique intervention provided a new way for combat veterans with PTSD to connect their past experiences with their current experiences, as well as develop new social connections and have a better transition into an unfamiliar civilian environment.

A third occupational therapy intervention was Bracciano's use of cranial electrotherapy stimulation for the treatment of PTSD. Cranial electrotherapy stimulation (CES) is a "physical agent modality that is clinically legitimate for occupational therapists to consider as an adjunctive method" that uses microcurrent waveforms with varying frequencies to change the electrical patterns of the brain (Bracciano, 2011). The changes in the brain can potentially help increase relaxation, and decrease insomnia, depression, and anxiety. The purpose of Bracciano's study was to identify the effects of CES on combat veterans with PTSD. Bracciano conducted a case study with two participants with a PTSD diagnosis and prior service in a military branch. The two participants did pretests before the intervention, self-administered CES at home for four

weeks, and came back to the university campus to complete the posttests. After the four weeks, it was shown that the use of CES decreased symptoms of PTSD in both participants (Bracciano, 2011). Bracciano suggests that occupational therapy and other healthcare professions could potentially include CES more often in their treatment of PTSD.

All three interventions mentioned showed to be effective in treating combat veterans with PTSD. However, it is worth noting that the occupational therapy interventions studied are quite varied; there is no specific occupational therapy intervention being used to treat PTSD with combat veterans. The variation in interventions can make it difficult to quantify exactly how effective occupational therapy is when it comes to treating PTSD.

Amputations

One of the more drastic physical conditions that can result from a combat veterans experience while deployed is amputations. Amputations can be defined as “an acquired condition that results in the loss of a limb, usually from injury, disease, or surgery” (Johns Hopkins Medicine, 2021). Amputations can often occur in both civilian and military environments, however, since Operation Enduring Freedom and Operation Iraqi Freedom, the number of military amputations has drastically increased. Since 2001, there have been approximately 1,705 amputations of combat veterans (Cancio, 2020). The amputations are all deployment-related and a combination of upper limb and lower limb. Due to the amputations occurring from deployment, the causes for amputation often differ for combat veterans than they would for civilians. The main causes for military amputation are “mortars, gun munitions, improvised explosive devices (IEDs), and rocket

propelled grenade launchers” (Smurr, 2008). Challenges to come along with deployment-related amputations can consist of the drastic impact the amputation has on work, psychosocial abilities, and mental health (Melcer, 2010).

When it comes to rehabilitating amputations, occupational therapy interventions typically have a specific protocol that consists of five phases. According to Smurr, the five phases are acute management and wound healing, introduction of preprosthetic training, prosthetic training, advanced functional training, and discharge planning (Smurr, 2008). The first phase, acute management, happens right after the injury occurs and promotes overall healing of the wound, independence in basic tasks like feeding, toileting, and oral hygiene, and education on the rehabilitation process. After acute management, the treatment moves on to preprosthetic training, where the client is prepared to receive a fitting and functional prosthesis. The phase continues with giving the client psychological support to help them move away from their combat mindset, as well as more education on functioning with prosthesis. This eventually transitions into full on prosthetic training where the prosthesis becomes integrated into the client’s daily life; they teach them how to control the movement of it, how to maximize its performance, and how to independently complete all of their basic activities of daily living. After getting a strong grasp on basic activities, the client can move on the advanced functional training, where they can start relearning more advanced tasks and become more efficient with their prosthesis. The last phase is discharge planning, which is coordinated by a multidisciplinary team that includes the occupational therapist. This phase looks into the client’s preinjury and postinjury status, as well as sets up a plan to

reintegrate them back into their community and provides them resources on how to best function once they are out of the hospital (Smurr, 2008).

Cancio's study reviewed the amount of occupational therapy encounters that combat veterans with upper limb amputations had within the first year of their amputation (Cancio, 2020). In this study, a sample of 148 combat veterans with upper limb amputations to see how often occupational therapy is used within the first year of injury, as well as the preferred occupational therapy practice patterns for combat veterans while they are in treatment. Most of the combat veterans received their injury due to blast mechanisms while deployed. It was found that among the 148 veterans, there 29,878 encounters with occupational therapy clinics. The average number of visits with occupational therapy clinics within the first year is between 88 and 116 visits, with the preferred intervention being active interventions. The active interventions consisted of "prosthetic training, therapeutic activities, and therapeutic exercise" (Cancio, 2020).

In another study about combat amputees, Melcer reviewed the medical and personnel records of 382 combat amputees to follow their outcomes. This study included both lower limb and upper limb amputees, whose injuries all occurred from explosions or blasts, typically from IEDs, RPGs, mortars, or landmines (Melcer, 2010). Around two-thirds of the combat amputees used physical therapy, occupational therapy, prosthetic and orthotic lab, psychiatric therapy, and orthopedic clinics. It was found that occupational therapy was most often used for the upper limb amputees, as well as it was found to be most used within the first year of the amputation, but it was encouraged for the combat amputees to potentially continue occupational therapy past one year of sustaining their

injury (Melcer, 2010). More research needs to be done on whether or not occupational therapy continues to be effective past the first year, however.

Occupational therapy interventions appear to be highly effective and well thought out for combat veterans who have sustained amputations. It appears that the five-phase process mentioned previously is used quite often and has become the main intervention process for combat amputees. However, most of the studies looked at the interventions within the span of the first year of the amputation, where occupational therapy is most heavily used. There is very little research on whether occupational therapy continues to be effective for combat amputees past one year.

Discussion

The findings of this systematic review suggest that occupational therapy interventions are effective for combat veterans experiencing difficulties with community reintegration. The articles selected throughout this process indicate that occupational therapy is a beneficial treatment for combat veterans, particularly Operation Enduring Freedom and Operation Iraqi Freedom veterans, since that is the specific population of combat veterans the articles focused on. The author found that common causes of community reintegration difficulties are mTBIs, PTSD, and amputations and chose to explore the literature of occupational therapy interventions for these three categories.

For the three categories, occupational therapy was seen to consistently help with the specific occupational challenges that each of them developed. For mTBIs, occupational challenges consisted of visual impairments, cognitive impairments, difficulty with the resumption of daily life roles, and difficulty with emotional well-being. Occupational therapy was shown to provide adaptations to these issues specific to

mTBIs and to rehabilitate service members' activities of daily living, sleep disruption, and support the process of transition of military to civilian life (Cogan, 2019). The foundation of occupational therapy's practice is also effective as its knowledge of cognitive, sensory, emotional, and motor skills when working with service members' with mTBIs is quite valuable (Speicher, 2014).

For PTSD, there are a multitude of occupational therapy interventions, all of which were shown to be effective with treating the occupational challenges of PTSD. Some of the most common occupational challenges are driving, self-care, socializing and developing new relationships, sleeping, and education. The interventions consisted of an 8-week residential program, a 5-week surfing program, and cranial electrotherapy. Each intervention decreased the levels of psychological symptom severity of PTSD in combat veterans. PTSD was the only category in this systematic review that had such a differing variety in interventions utilized. Having one widely used intervention among occupational therapists could potentially further prove the effectiveness of occupational therapy for PTSD in combat veterans. However, the variety of interventions could be due to the fact that PTSD is a disorder that can affect every person differently and could potentially require more innovative and varied solutions. It is an area that should be considered for future research.

For amputations, occupational therapy was shown to be effective for combat veterans, mainly within the first year of recovery and mainly for upper extremity amputees (Cancio, 2020). The literature for this category was much more limited compared to the other two categories, however the literature that did appear stated that occupational therapy was a beneficial, and sometimes necessary, form of treatment for

amputees in the military. Unlike the interventions for PTSD, occupational therapy has a very specific protocol for amputations that has little room for variation. The protocol consists of acute management, introduction of preprosthetic training, prosthetic training, advanced functional training, and discharge planning (Smurr, 2008). The use of this protocol was revealed to be highly effective for military amputees within the first year of treatment (Melcer, 2010). However, there is little to no research on whether occupational therapy interventions continue to be effective past the first year. This is an area for further research.

Limitations

One limitation to this study was that the author could only select articles that were written or translated to English. Articles of a different language were not chosen for this systematic review. Another limitation was the lack of research in certain areas. For amputations, the articles mainly consisted of studies that happened within the first year of an amputation and the author could not find articles about occupational therapy interventions for military amputations that went past the first year. There was also limited research in a universally used intervention for PTSD, all of the studies used different interventions. The effectiveness of occupational therapy interventions for PTSD in combat veterans could have potentially been even stronger if there was more of a widely used intervention among occupational therapists. Next, a potential limitation is that each article selected for this systematic review yielded positive results for occupational therapy interventions, as most academic journals are less likely to publish negative results. There could have potentially been a publication bias.

Conclusion

The results of this systematic review exhibit that occupational therapy interventions for combat veterans experiencing difficulties with community reintegration can be effective. Occupational therapy provides an innovative, holistic approach that can allow combat veterans find new meaning and purpose in their occupations after experiencing post-deployment related difficulties. For combat veterans to continue improving their reintegration skills, occupational therapy is a necessity within the military and within the United States Department of Veterans Affairs. The effects of deployment do not end once the deployment ends; they are long lasting and can potentially last a lifetime if not given effective treatment. Future research on this topic can contribute to proving the use of occupational therapy on combat veterans and continue to expand its utilization within the military, essentially getting one step closer to providing combat veterans the highest quality treatment they deserve to receive.

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