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# Farmers with Upper-Limb Amputations and Their Daily Routine

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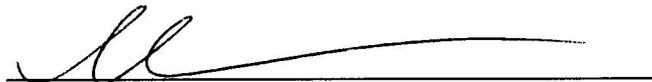
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FARMERS WITH UPPER-LIMB AMPUTATIONS AND THEIR DAILY ROUTINES

By

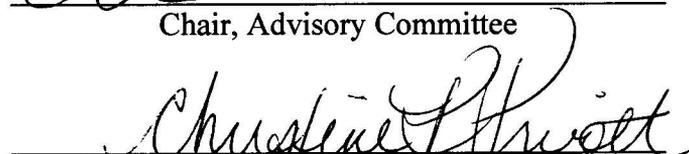
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Farmers with Upper-Limb Amputations & Their Daily Routines

By

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Bachelor of Science in Occupational Science

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## ABSTRACT

For upper-limb amputees who are associated with the farming industry, the process of completing daily occupations may be challenging, especially for those who have not received guidance from occupational therapy. Currently, there is little research in the area of farmers with amputations and their daily routine. The purpose of this phenomenological case study was to explore the attitudes, beliefs, and needs related to the daily routines of upper-limb amputee who is currently working or has previously worked in the farming industry. Participant was asked to share his/her daily routine and how the amputation has affected her ability to perform everyday tasks. A personal, semi-structured interview was conducted with the participant and was audiotaped. The tapes were transcribed verbatim and coded after each session. Observation of the home/work environment was conducted for field notes and to supplement verbal data.

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## Chapter 1

### INTRODUCTION

Farming is the roots of all society. When humans made the discovery of how to farm, we suddenly increased the ability of the land to support us. Farming is a controllable food supply and a food surplus, which makes cities possible and also the specialization of labor. Agriculture with surplus is practiced all over the world with extensive manipulation of the land, and is able to support populations who are not directly involved with the production of food (Green, 2012). Farmers are invested in land. They are independent business people who provide food and crops to communities through laborious work. The responsibilities of farmers may include raising crops, livestock, fish, poultry, and/or producing dairy or nursery products. They must also know how to operate a wide variety of farming machinery and equipment, such as tractors, trucks, plows, combines, pumps, and chainsaws (Greenwood, 2014).

Because crop production is highly influenced by external factors such as weather, disease, fluctuations in prices, and federal farm programs, many farmers are required to carefully plan ahead the combination of crops that they desire to grow in order to protect themselves from unpredictable changes in the markets (Bureau of Labor Statistics, 2014). Most farmers change their work routines in order to accommodate for the time of year. “Farmers and farm managers on crop farms usually work from sunrise to sunset during the planting and harvesting seasons; during the rest of the year, they plan the next season’s crops, market their output, and repair and maintain machinery (Bureau of Labor

Statistics, 2014). The importance of farmers establishing a routine based on their surrounding environment and the time of year is crucial in terms of crop and the output of livestock production.

The work environment of farmers can be extremely hazardous. Farm machinery can lead to serious injuries; so workers must always be alert on the job in order to properly avoid accidents. In 2011, the injury rate for agricultural workers was over 40 percent higher than the rate for all works in the United States (Bureau of Labor Statistics, 2012). While some of these injuries may lead to fatalities, there are many more non-fatal injuries that occur in the agricultural business. According to the National Safety Council, among those who are employed in the agricultural business, “one out of every ten of these workers will suffer an amputation while on the job” (Kircher, 2003). It is estimated that approximately 5 to 6 percent, or about 1 out of every 200 farmers, will suffer a major limb amputation that involves either the complete loss of a hand, foot, or more of a limb (Brown, 2003). Many of these farmers with major limb amputations are geographically isolated, working in remote settings that are generally far away from rehabilitation programs, such as Vocational Rehabilitation (VR), AgrAbility, and therapy-related services (Mathew et al. 2011). Therefore, health professionals who work primarily with these clients who live in rural settings should be familiar with these programs and provide the proper knowledge about the benefits of their services for those individuals with disabilities who desire to continue working on their farms.

### Background and Need

People continue to suffer from amputations, especially in the agricultural business. When these individuals have undergone a traumatic experience, such as limb

loss from a serious injury, they must learn how to adapt to their environment and acquire strategies that permit engagement in activities done prior to the injury. It is important to study routine to link disabled farmers with meaningful occupations and understand how adapting to their surrounding environment will change their way of engaging in farm-related tasks. A thorough search of the literature was conducted, but very little published research was found describing the lived experience of farmers with upper-extremity amputations and their daily routines. By learning how these farmers with disabilities establish their daily routine, researchers can gain insight into the significance of meaningful occupation and task performance. This insight can aid therapists when these individuals are going through the process of rehabilitation or treatment of a disability. Knowing how farmers with upper-extremity amputations complete activities involving both self-care and work-related tasks can provide therapists the opportunity to provide their clients with the support they need in order to have a successful recovery.

### Problem Statement

Within the occupational science and occupational therapy literature, studies have been conducted focusing on various interventions for work-related injuries of the upper body (Amini, 2011). Studies have been conducted in various medical professions, such as orthopedic nursing, on farmers in the United States who have experienced traumatic amputations and their desire to return to work (Reed, 2004). However, there is currently very limited research regarding farmers with upper-extremity amputations and the occupations that constitute their daily routine from an occupational therapy point of view. Studies that have been conducted regarding farmers with amputations do not specifically address the lived experience of those individuals and the complex tasks involved while

engaging in the meaningful occupations that constitute their daily routine, but focus on the recovery process, prostheses/adaptive equipment use, modified technology and prevention of secondary injuries within this specific line of work. (Grisso et al., 2009; Heckathorne et al., 2011; Narayan, 2013).

### Statement of Purpose

The purpose of this phenomenological case study was to explore the attitudes, beliefs, and needs related to the daily routine of an upper-limb amputee who is currently working or has previously worked in the farming industry. The study began with an informal observation of the participant's primary work setting as well as his largest property of farmland, followed by a semi-structured interview between the researcher, the participant, and an occupational therapist from AgrAbility. Both the observation and interview were conducted to explore the relationship between the participant's amputation and his daily routine. This data was then collected and divided into themes based on the Ecology of Human Performance (EHP) theoretical framework in order to investigate the relationship between the participant, his surrounding contexts, his core values, and attitudes that affect his abilities to safely perform the tasks that constitute his daily routine.

This research will help health professionals better understand the significance of tasks involved in the daily routines of farmers with upper-extremity amputation and how their attitudes and beliefs directly affect their abilities to engage in meaningful occupations, especially in farmwork. Understanding the lived experience of an individual with an upper-extremity amputation who continues to work in the farming industry after his injury can help health professionals and therapists better understand how to include

intervention strategies related to farmwork in their rehabilitation or treatment process. By learning these important aspects of the client's life, an occupational therapist can make sure their client has developed the proper skills, strategies, strength, and endurance to engage in the tasks that are involved in their daily routine.

### Research Questions

- How does a farmer with a major upper-limb amputation describe the lived experience of his daily routine since the occurrence of the amputation?
- What aspects of the individual's daily routine have changed since the amputation in order to obtain a farming lifestyle?

### Definition of Terms

- Amputation - "loss of all or a portion of a body part" (Falvo, 2009)
- Conditioner – "an agricultural machine that crimps and crushes newly cut hay to promote faster and more even drying" (Wikipedia)
- Ecology of Human Performance (EHP) – a theory that "was developed to provide a framework for investigating the relationship between important constructs in the practice of occupational therapy: person, context (temporal, physical, social, and cultural), tasks, performance, and therapeutic intervention, to better understand the domain of human performance" (Dunn et al. 1994 , p. 598)
  - Context – "physical, social, cultural, and temporal factors that operate external to the person and influence behavior" (Dunn et al. 1994, p. 595)
  - Tasks – "objective sets of behaviors necessary to accomplish a goal" (Dunn et al. 1994, p. 599)

- Haybine – “the brand name of the first mower-conditioner. It combined the sickle bar mower and the hay conditioner to promote faster drying hay all in one process” (Wikipedia). The participant in this case study mentions the use of his haybine during farm-related tasks throughout the interview.
- Mower-Conditioner – “a staple of large-scale haying. They are defined by the mechanisms that accomplish mowing and conditioning” (Wikipedia)
- Occupation - “a subjective event in an individual’s perceived temporal, spatial, and sociocultural conditions that is unique to that one-time occurrence. An occupation has a shape, a pace, a beginning, and an ending, a shared or solitary aspect, a cultural meaning to the person, and an infinite number of other perceived contextual qualities. A person interprets his or her occupations before, during, and after they happen. Though an occupation can be observed, interpretation of the meaning or emotional content of an occupation by anyone more than the person experiencing it is necessarily inexact” (Pierce, 2001, p. 139)
- Routine – “A pattern of behavior that is observable, regular, repetitive, and that provides structure for daily life. It can be satisfying, promoting, or damaging. Routines require momentary time commitment and are embedded in cultural and ecological contexts” (AOTA, 2008)
- Vocational Rehabilitation (VR) – “a funding agency with offices in all 50 states, offering services through vocational rehabilitation counselors (VRC) and certified rehabilitation counselors (CRC). VRCs are skilled in vocational counseling, vocational assessment, affective counseling, understanding vocational

implications of physical and mental disability, and job development, placement, and advocacy” (Mathew et al. 2011, p. 94)

-AgrAbility – “a program initiated by the USDA in 1990 to train, educate, support, and provide technical information to farmers with disabilities, with a current presence in 23 states” (Mathew et al. 2011, p. 94)

### Assumptions

- 1) The presence of an upper-extremity amputation will disrupt or alter the ways in which a farmer continues to engage in meaningful occupations, such as farming.
- 2) The Ecology of Human Performance (EHP) theoretical framework supports the tasks involved in the daily routines of farmers with upper-extremity amputations.
- 3) Farmers with disabilities are unaware of the significance of AgrAbility and receiving Vocational Rehabilitation (VR) due to geographical isolation and lack of proper knowledge.

## Chapter 2

### LITERATURE REVIEW

There is a significant lack of research on the subject of farmers with upper-extremity amputations and how it affects their daily routine. There seems to be far more research regarding those individuals with upper-extremity amputations who have returned from war (Cater, 2012; McFarland et al., 2010; Melcer et al., 2010; Pasquina et al., 2008; Robbins et al., 2009), suffered from disease (Lardenoye et al., 2009; Thomas et al., 2011), or have survived a traumatic event (Augustine, 2011). This case study will provide a thorough look into one farmer's daily routine after surviving a near-fatal farming accident, resulting in a bilateral upper-extremity amputation. There are four tables that present research pertaining to concepts that relate to farmers and/or amputations. Each table is organized into seven columns, which are as follows: Author/Year, Study Objectives, Level/Design/Participants, Intervention and Outcome Measures, Results, Limitations, and Complete Citation.

#### Farmers and Physical Disability

Farming is considered to be one of the oldest ways of making a living, dating back to over 5,000 years ago (Guilfoyle, 1992, p. 2044). The United States is known for running some of the most productive farms in the entire world, many of which stock their extra produce and sell to other countries (BLS, 2010). Over half of the world's workforce was geared towards land labor, but it wasn't until the 1970s that the agricultural industry began to see radical changes in the production of crops and animals (Guilfoyle, 1992, p.

2044). While the integration of technology has been able to increase productivity rates of farming, there has also been a rise in new health and safety problems for the individuals working with this newfound technology. In 1986, it was roughly estimated that farmers in the United States suffered from over 100,000 injuries due to chemicals, pesticides, and machinery found in the farming industry (Guilfoyle, 1992, p. 2045).

Clearly, these problems can lead to serious, life-threatening injuries that have a significant impact on how farmers perform their daily routine both at home and at work. Farmers who suffer from a major injury increase their likelihood of developing a physical disability, which limits their abilities to perform their life occupations. Therefore, the significance of farmers who have a physical disability was determined through a systematic literature review. Table 1 includes five references that are Level V studies, pertaining to farm-related task performance with a physical disability.

Table 1 – Farmers and Physical Disability

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Augustine (2010)	A case review demonstrating the care of a major trauma patient who has lost most of his blood volume in a farm-related accident. It looks at how the EMS “Attack One” response crew handled the situation.	Level: V  Design: Case Review  Participant: A 32-year-old male with multiple injuries, trapped in a farming machine	Victims may require major resuscitative efforts, as this one did, using a variety of tools and techniques. Agricultural areas are often far from trauma centers, so victim care will require consideration of appropriate transportation. Victims of major trauma incidents will benefit if EMS agencies have excellent working relationships with regional air ambulance services.	In caring for victims of agricultural accidents, prioritize stabilization of airway, breathing and circulation; preventing or reversing shock; and rapid transport to the appropriate hospital. Where necessary, medical control may assist in making difficult decisions involving saving lives or limbs.	N/A

Complete Citation: Augustine, J. J. (2010). Man vs. Machine. *EMS Magazine*, 39(6), 18-21.

Table 1 (continued)

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Grisso, Perumpral, & Ballin (2009)	To reduce the number of secondary injuries by familiarizing the readers with secondary injuries and the steps they can adopt to minimize them.  Steps that can be taken to prevent such injuries.  A list of agencies that farmers can contact for assistance when they experience secondary injuries.	Level: V  Design: Fact sheet	The impact of secondary injuries on farm workers can be devastating because it complicates their health and work status by placing an additional burden on them and their families. Damage from secondary injuries is often irreversible or recovery time can be long creates additional stress on all involved.  Make changes to living and working environments to accommodate the disabled individual..	Individuals with existing disabilities or injuries should avoid physically demanding agricultural activities to avoid sec- ondary injuries. If and when this is not a viable option, the use of proper assistive technologies to minimize the incidence of secondary injuries must be adopted.	N/A

Complete Citation: Grisso, R., Perumpral, J., & Ballin, K. (2009). Preventing secondary injuries in the agricultural workplace. *Virginia Cooperative Extension*, p. 1-7.

Table 1 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Haire (2009)	Farmers with physical disabilities are often a little too self-reliant to ask for help or don't know where to find it. But help is out there. Soon, they'll have an entire farm dedicated to equipment and training especially designed to help them farm more comfortably. The groundbreaking for the AgrAbility Farm took place recently at the UGA College of Agricultural and Environmental Sciences campus in Tifton. Ga.	Level: V  Participants: Farmers with physical disabilities; UGA College of Agricultural and Environmental Sciences	Once complete, the farm will be open to the public and available for school groups to visit and for health care and rehabilitation professionals to attend training sessions targeted to help disabled agricultural workers.	The program is a service that can link someone in Georgia to a chain of Cooperative Extension educators, disability experts, rural living professionals and volunteers across the state and the country. Anyone who works/wants to work in agriculture and has a physical, cognitive or illness-related disability is eligible.	N/A

Complete Citation: Haire, B. (2009) Farm breaks new ground to help disabled. *Southeast Farm Press*, 36(28), 22-25.

Table 1 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Marlene & Vida (1999)	This study sought to shed some light on the issue of disability among farmworkers and their children. This in-person survey asked about disability and health status, as well as experiences with the mainstream and disability-specific service systems.	Level: V Design: In-person survey, case study Participants: a purposive sample of 201 adult farmworkers with disabilities and 66 disabled children in farmworker families in six states.	-Qualitative community-level case studies explored issues of service access, coordination and barriers for disabled farmworkers, both adults and children.  -Research staff from BPA conducted the case study visits, spending two to three days at each location.	Adult farmworkers experience a wide range of disabilities from musculo-skeletal problems to sensory disorders and chronic health conditions. These disabilities cause functional limitations for farmworkers in their work and life outside of work. Adults most commonly experienced back problems and other musculo-skeletal problems. 61% of those surveyed continued to do farmwork.	-Vast majority of farmworkers are members of ethnic minority cultures  -Interviews primarily consisted of closed-ended questions  -Spent more time interviewing service providers

Complete Citation: Marlene F., S., & Vida J., M. (1999). Farmworkers and disability: results of a national survey. *Journal Of Vocational Rehabilitation*, 12(1), 45.

Table 1 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Narayan (2013)	To reflect on the importance of disability management in agriculture in developing countries, the importance of farmers with disabilities in agri-business to maximize human resources and promoting dignity and social cohesion, and the use of electronics & new technology to assist farmers with disabilities.	Level: V  Design: Opinion of expert	Vigorous labour-intensive tasks involving the use of two strong arms, legs and back can now be performed easily by disabled people with the help of machines or adapted agricultural devices. As global society marches towards inclusivity and access to affordable and reliable technology for empowering people with disabilities, vibrant and vocal disability rights groups are supporting the cause of disabled people	The use of electronics & new technology (centralized controls, hydraulics, monitoring systems, computerization) has facilitated considerably the participation of persons with disabilities in agri-business. Other types of farming activities for disabled people include: wheel-chair farming; small tool making; blacksmithing; greenhouse horticulture; bee-keeping; silk making; and small-scale food preparation and processing.	In rural areas, families work on farms passed down for generations, and little thought is given to involving people with disabilities in farming.

Complete Citation: Narayan, G. (2013). Disability management in agriculture in developing countries. *International Journal Of Therapy & Rehabilitation*, 20(6), 278-279.

To summarize the content of Table 1, Augustine (2010) explained the thorough process of caring for an individual who has suffered from a traumatic injury from a farming accident. The case review provided evidence that supports the importance of strong EMS management and efficiency of handling the situation of transporting the farmer with an injury from a rural area to the hospital. Grisso, Perumpral, & Ballin (2009) created a fact sheet in order to reduce the number of secondary injuries typically seen in farm workers by familiarizing the public with the steps to take to minimize these injuries, which include making significant changes to living and working environments of these individuals involved in farm work. Haire (2009) summarized the benefits of farmers with physical disabilities utilizing AgrAbility, which is a program that educates the public on adaptive equipment use and training specially designed to help them farm more comfortably and efficiently.

Marlene, & Vida (1999) concluded that farmworkers and their families experience a wide variety of physical injuries, which can range from musculoskeletal problems to sensory disorders and chronic health conditions; these problems can result in functional limitations for farmers in their work and home environment. Of those who participated in the study, 61% of farmers continue to do farmwork despite having conditions generally accepted as disabling. Narayan (2013) reflected on the importance of disability management in the agricultural work setting. He concluded that the use of electronics, computerization, and monitoring systems are beneficial in assisting farmers with physical disabilities.

## Amputations in the Military Workforce

Losing a limb affects almost all aspects of an individual's life, including long-term health outcomes and how they either positively or negatively impact the ability to perform daily tasks. One study primarily focused on veterans who have received amputations after military actions in Iraq and Afghanistan. The researchers found that “there is an increased rate of cardiovascular disease (CVD) and ischemic heart disease (IHD) mortality in the amputee population” (Robbins, Vreeman, Sothmann, Wilson, and Oldridge, 2009, p. 591). Obtaining an amputation presents new challenges in occupational performance, let alone any onset of additional health risks factors like CVD and IHD that may hinder an individual's ability to perform tasks in their daily routine.

Extensive research has been conducted on war-related amputations, which provides information that focuses on the importance of rehabilitation for those who sustain similar injuries in their work routine. Amputations in the Military Workforce (Table 2) includes five references pertaining to both the physical and mental attributes that may develop for those who have suffered from a major limb amputation in combat and the health outcomes associated with the amputation. Four articles were Level V studies, and one article was a Level I study.

Table 2 – Amputations in the Military Workforce

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Cater (2012)	Six Army women shared their personal adjustment experience to limb loss. This experience included personal safety fears, body image issues, grief, and loss.	Level: V  Participants: 6 Army women with limb loss	In phenomenological research, the primary source of data is in-depth interviews, wherein each individual is asked to share his or her lived experience of a life phenomenon.	While every servicewoman's life experience was different, common themes emerged in three major categories: physical disability adjustment issues, psychosocial adjustment and coping skills, and an emerging new sense of self and life purpose	Possible researcher and participant biases, the representation of only one racial group (Caucasian), and a small sample size. Also, all six women served in the Army or Army National Guard and were deployed to only one combat zone: Iraq.

Complete Citation: Cater, J. K. (2012). Traumatic amputation: Psychosocial adjustment of six Army women to loss of one or more limbs. *Journal Of Rehabilitation Research & Development*, 49(10), 1443-1455. doi:10.1682/JRRD.2011.12.0228

Table 2 (continued)

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
McFarland, Choppa, Betz, Pruden, & Reiber (2010)	This appendix identifies sources of information for individuals with major limb loss as resources for military personnel and their family members from the Department of Veterans Affairs Five detailed tables identify some of the agencies, their contact information, and some of the services available.	Level: V  Design: resource article  Participants: service members, veterans, and their families who are experiencing the challenges involved in recovering from major limb loss.	Many resources are available for service members who experience combat-associated major limb loss. Navigating print, Internet, and in-person information and services is key.	A large variety of military and veterans benefits and organizations are available that assist in healthcare, transportation, housing and automobile modifications, emotional support, exploration of innovative prosthetic device technologies, recreation, and community building.	N/A

Complete Citation: McFarland, L. V., Choppa, A. J., Betz, K., Pruden, J. D., & Reiber, G. E. (2010). Resources for wounded warriors with major traumatic limb loss. *Journal of Rehabilitation Research & Development*, 47(4), p. 1-13.

Table 2 (continued)

Author/ Year	Study Objectives	Level/Design / Participants	Intervention and Outcome Measures	Results	Limitations
Melcer, Walker, Galarneau, Belnap, & Konoske (2010)	The purpose of this study was to follow the outcomes of warfighters who sustained combat amputations in Operation Enduring Freedom or Operation Iraqi Freedom (OEF/OIF), which tend to have unique challenges during rehabilitation	Level: V  Design: retrospective review of existing medical and personnel records approved by the IRB.  Participants: 382 U.S. warfighters with major limb amputations after combat injury in OEF/OIF between 2001 and 2005.	No intervention applied by researchers.  Outcome measures were diagnoses, treatment codes, and personnel events captured by health and personnel databases during 24 months post injury.	Most patients had multiple complications generally within 30 days post- injury (infections & anemia). Bilateral above knee/above elbow amputees had numerically higher severity scores than below elbow below knee amputees. Lower limb amputees had 50% more complications than upper limb amputees. Over 80% of patients used PT & OT, prosthetic & orthotic services.	Short follow- up period due to patient discharge from military services, under- reporting of some diagnoses by providers, and the fact that approximately 75% of the present patients were lower extremity amputees, which resulted in a low TBI rate for the study.

Complete Citation: Melcer, T., Walker, G., Galarneau, M., Belnap, B., & Konoske, P. (2010). Midterm health and personnel outcomes of recent combat amputees. *Military Medicine*, 175(3), 147-154.

Table 2 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Pasquina, Tsao, Collins, Chan, Charrow, Karmarkar & Cooper (2008)	This study analyzed satisfaction ratings on the various aspects of medical and rehabilitative care provided to military service members who sustained limb amputations during military operations in the GWOT.	Level: V  Design: retrospective analysis  Participants: service members who visited the outpatient amputee clinic at WRAMC in Washington, DC, 158 service members who received outpatient care from November 2003 through March 2005.	Performed multiple separate analyses by grouping participants according to the following independent variables:  1. Age at time of injury. 2. Military rank. 3. Geographic location where injured. 4. Area of amputation.	The results of this QoC satisfaction questionnaire suggest that the medical and therapeutic programs established by the WRAMC are largely meeting the needs of injured service members who sustained service-related traumatic limb amputations during the GWOT.	-Small sample size recruited for this study  -The use of a nonstandard- ized satisfaction questionnaire  -The pressure perceived by military personnel to positively rate a DOD service, because of possible fear that a bad rating may reflect badly on them

Complete Citation: Pasquina, P. F., Tsao, J. W., Collins, D. M., Chan, B. L., Charrow, A., Karmarkar, A. M., & Cooper, R. A. (2008). Quality of medical care provided to service members with combatrelated limb amputations: Report of patient satisfaction. *Journal Of Rehabilitation Research & Development*, 45(7), 953-960.

Table 2 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Robbins, Vreeman, Sothmann, Wilson, & Oldridge, (2009)	The purpose of this literature review is to examine long-term health outcomes that are associated with both war-related amputation among military service members and, where appropriate, among civilians.	Level: I  Design:  Systematic Literature Review	-Reviewed the literature of health outcomes and war-related amputations via a broad Internet search and used specific keywords (Vietnam, veteran, traumatic amputation, war-related, military, combat) in PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) for review to those involving military personnel with war-related amputations	Details of the specific studies include health outcomes, author, reference number, date of publication, level of amputation, and percentage of population in that study with a combat-related amputation. The literature review found that clinicians caring for combat-related amputees, should watch closely for early onset obesity and hypertension as these are important risk factors for CVD.	-Only a small number of relevant and recent studies  -Although over 900 returning veterans with combat-related amputations may be getting the best in rehabilitative care and technology available, their expected long-term health outcomes are considerably less clear

Complete Citation: Robbins, C. B., Vreeman, D. J., Sothmann, M. S., Wilson, S. L., & Oldridge, N. B. (2009). A Review of the Long-Term Health Outcomes Associated With War-Related Amputation. *Military Medicine*, 174(6), 588-592.

To summarize the information provided in Table 2, Cater (2012) concluded that after sharing their personal adjustment experiences to limb loss, female military veterans' resiliency helped them to successfully adapt to their traumatic amputation. McFarland, Choppa, Betz, Pruden, & Reiber (2010) provided a "wide selection of resources available to support servicemembers, veterans, and their families who are experiencing the challenges involved in recovering from major limb loss" (p. 13) through an appendix that identifies organizations that assist in all aspects of everyday living, which includes healthcare, transportation, housing, and automobile modifications. Melcer, Walker, Galarneau, Belnap, & Konoske (2010) concluded that lower-limb amputees had 50% more complications than upper-limb amputees in their health outcomes after sustaining traumatic limb loss while in combat. Of those who participated in the study, over 80% of amputees utilized PT & OT services, prosthetic & orthotic services, and psychiatric care.

Pasquina, Tsao, Collins, Chan, Charrow, Karmarkar, & Cooper (2008) collected high satisfaction rates from combat-related amputees who were receiving inpatient services from the Walter Reed Army Medical Center (WRAMC), which offers highly structured and interdisciplinary programs of care for individuals with amputations that focuses on Activities of Daily Living (ADLs) and more complex tasks. Robbins, Vreeman, Sothmann, Wilson, & Oldridge (2009) concluded that clinicians "should watch closely for early onset obesity and for the development of hypertension and hyperinsulinemia as these are important risk factors for CVD" (p. 591) in combat-related amputees who are receiving rehabilitative services to return back to their everyday life.

## Prosthetic Use

Once an individual has undergone an amputation, it is likely that they will consider utilizing prostheses in their everyday routine. A prosthesis is an artificial limb replacement and an essential tool that can be used by amputees to perform daily activities and support overall functional needs. The amputee is introduced to prosthetic wear during the rehabilitating stage, and is educated on the activities that are either supported by or hindered by the use of a prosthesis. A major problem that seems to be a common theme amongst farmers who are receiving rehabilitative services is learning the basic principles for performing farm-related tasks with prosthetics. Therapists are unaware of the tasks that are involved with farming and, therefore, cannot properly educate the amputee on the proper mechanics used while farming with a prosthesis.

Prosthetic Use (Table 3) includes six articles that address this concern and many others that arise from prosthetic use. All six articles are Level V studies. One reference pertains to the prosthetic needs of farmers with upper-extremity amputations. Two of the references pertain to prosthetic cost and use in the military. One reference pertains to the use of prosthetics for individuals with partial hand amputations. One reference pertains to the comparison of myoelectric and conventional prosthetic use. The final reference pertains to the satisfaction of upper-extremity amputees and the use of the provided prosthetics in their everyday routine.

Table 3 – Prosthetic Use

Author/ Year	Study Objectives	Level/Design / Participants	Intervention and Outcome Measures	Results	Limitations
Blough, Hubbard, McFarland, Gambel & Reiber (2010)	This study projects prosthetic- and assistive- device costs for veterans with limb loss from Vietnam and injured service- members returning from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) to inform the Department of Veterans Affairs (VA) for these veterans’ future care.	Level: V  Design: National survey  Participants: service- members with major limb loss (excluding digit-only) from OIF/OEF. 298 from the Vietnam conflict and 283 from the OIF/OEF conflicts	Participants were surveyed using one of three methods (mail, telephone interview, or Web site) during 2007 and 2008.  -Projections were made for 5-year, 10- year, 20-year, and lifetime costs based on eight Markov models.	By limb-loss level, for the Vietnam group and OIF/OEF cohort, 5-year projected unilateral upper limb average costs are \$31,129 (Vietnam) and \$117,440 (OIF/OEF), unilateral lower limb costs are \$82,251 (Vietnam) and \$228,665 (OIF/OEF), and multiple limb costs are \$130,890 (Vietnam) and \$453,696 (OIF/OEF), respectively.	The lifetime cost projections do not account for significant changes in health policies or practices.

Complete Citation: Blough, D. K., Hubbard, S., McFarland, L. V., Smith, D. G., Gambel, J. M., & Reiber, G. E. (2010). Prosthetic cost projections for service members with major limb loss from Vietnam and OIF/OEF. *Journal Of Rehabilitation Research & Development*, 47(3), 387-402. doi:10.1682/JRRD.2009.04.0037

Table 3 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Burger, Maver, & Marinček (2007)	To find whether or not subjects after partial hand amputation could return to the same job and whether or not they used their silicone finger prosthesis for work.	Level: V  Design: Question- naire  Participants: 112 patients who had undergone a traumatic partial hand amputation and who had been treated in the Upper Limb Prosthetic Clinic at the Institute for Rehabilitati on in Ljubljana	Medical records of all the patients who had undergone traumatic partial hand amputation were reviewed. A questionnaire was sent to all the patients (112 subjects), focusing on the type of upper- extremity amputation, any additional medical problems, type of work, and whether or not these subjects returned to work after their amputation.	Less than half the subjects who had undergone partial hand amputation were able to return to the same work as before the amputation. An aesthetic (cosmetic) silicone prosthesis is helpful particularly for subjects with higher education whose work involves personal contacts and for whom aesthetics is important. They can use the prosthesis for certain activities, such as typing.	A study using a larger sample would enable further conclusions to be made.

Complete Citation: Burger, H., Maver, T., & Marinček, Č. (2007). Partial hand amputation and work. *Disability And Rehabilitation: An International, Multidisciplinary Journal*, 29(17), 1317-1321. doi:10.1080/09638280701320763

Table 3 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Davidson (2002)	To describe the demographics of the Australian upper limb amputees and investigating prosthesis wearing times, the overall level of satisfaction with the prostheses and abilities, the level of satisfaction with characteristics of the prostheses, and types of prostheses currently used.	Level: V  Design: Survey  Participants: Seventy Australian upper limb amputees	The first questionnaire had 17 questions, and the second had 38 questions. Nearly all the questions were designed as “closed” questions. Questionnaires looked at prosthesis wearing time and use of grasping features, satisfaction with individual functional activities, employment, recreational pursuits, overall satisfaction with prostheses and abilities, pain and other disability, and car driving.	Their prostheses were rated as “fair” or “not acceptable” by 64% of amputees. Many respondents were able to be independent and return to work without using prostheses.	N/A

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Complete Citation: Davidson, J. (2002). A survey of the satisfaction of upper limb amputees with their prostheses, their lifestyles, and their abilities. *Journal of Hand Therapy*, 15, p. 62-70.

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Table 3 (continued)

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Messinger (2009)	To look at the role that context of injury plays in the rehabilitation of military patients who sustained a limb amputation as a result of blast injury trauma in Afghanistan and Iraq.	Level: V  Design: Two case studies (Henry Bare and Ronald Eiger); ethnography  Participants: Two officers in the Army with upper-extremity amputations	Two case studies are contrasted illustrating the reasons behind the rejection of an upper extremity prosthetic device in one example and the acceptance of one in another.	Each patient's experience of autonomy or control is important, both in terms of outcomes in the rehabilitation program and at the time of injury. Both patients were seen by their occupational therapist to have gained significant mastery over their upper extremity prosthesis.	Although researchers and clinicians are increasingly recognizing the contribution of psychosocial issues in patients with limb loss to good outcomes there is still considerable work yet to be done.

Complete Citation: Messinger, S. D. (2009). Incorporating the prosthetic: Traumatic, limb-loss, rehabilitation and refigured military bodies. *Disability & Rehabilitation*, 31(25), 2130-2134.

Table 3 (continued)

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Weaver, Lange, & Vogts (1988)	To compare myoelectric and conventional prosthetic function in a homogeneous adolescent patient population. It was questioned whether myoelectric prostheses were a reasonable alternative to conventional prostheses for adolescents with unilateral, congenital, below-elbow amputations in respect to fit, function, cosmesis, and cost.	Level: V  Design: Survey  Participants: Ten candidates ranging in age from 12 to 18 years with who were congenital, unilateral, below-elbow amputees at Shriners Hospital for Crippled Children, Philadelphia Unit.	Screening was done by an occupational therapist, a prosthetist, and a social worker.  Four variables were studied: Fit, Function, Cosmesis, and Maintenance	From this study of 10 subjects, the researchers found that myoelectric prostheses provided an intimate fit, freedom from harnessing, and increased pinch whereas conventional hook prostheses allowed more active range of motion of the elbow and forearm of the residual limb and were lighter.	The individuals in this study were carefully selected, and the researchers do not suggest that the results can be generalized to all adolescent unilateral, below-elbow amputees. More investigation is needed to define the guidelines for the selection of patients by clinic teams.

Complete Citation: Weaver, S. A., Lange, L. R., & Vogts, V. M. (1988). Comparison of myoelectric and conventional prostheses for adolescent amputees. *American Journal Of Occupational Therapy*, 42(2), 87-91.

To summarize the contents in Table 3, Blough, Hubbard, McFarland, Gambel, & Reiber (2010) concluded that over the next 5, 10, and 20 years, future prosthetic costs may be manageable for the Veteran's Affairs (VA) and the Department of Defense (DOD), providing available resources to the veterans of Vietnam, Operation Iraqi Freedom (OIF), and Operation Enduring Freedom (OEF). Higher costs are associated with OIF/OEF servicemembers, especially those with multiple limb loss, due to the high number of devices used and also newer advanced technologies (p. 400). Burger, Maver, & Marinček (2007) concluded that twelve out of 26 participants (46.2%) did not wear their aesthetic (cosmetic) prostheses at work, six (23.1%) would wear it occasionally, and eight (30.8%) wore it regularly at work. Of those 26 participants, ten (38.5%) did not find the prostheses to be useful at all due to various reasons, such as the loss of fingertip sensitivity and lack of grip strength for holding and grasping heavy objects (p. 1320).

Davidson (2002) concluded that out of the seventy upper-limb amputees who responded to a questionnaire focusing on prosthetic wear and their level of satisfaction, 56% of amputees wore their limbs "once in a while" or "never," and only 24% were satisfied with their prostheses, whereas 28% were satisfied with their abilities while wearing their prostheses during functional activity (p. 66). Heckathorne, & Waldera (2011) concluded that the "number one problem identified by both farmers and prosthetists was durability" (p. 2). Other common problems that farmers found while wearing their prosthetics during farmwork included rapid deterioration of rubber bands due to sunlight, heat and chemicals, failure of wrist units, breaks in control cable from fittings, and cracks in the lamination. Most farmers did not own a second pair of

prosthetics due to insurance or money constraints, so they had to make their own repairs on their prostheses.

Messinger (2009) concluded that although individuals with amputations may have good outcomes with surgery and eventually succeed with prosthetic use in the rehabilitation stage, there is an increased chance that the individual will not continue to utilize their prostheses upon leaving the program and in their daily routine due to psychosocial issues. It is important that the clinicians remain mindful to the patient's needs and provide the supportive care that leads to positive outcomes for prosthetic use. Weaver, Lange, & Vogts (1988) concluded that the myoelectric prostheses offered more freedom in harnessing and an increased pinch, while the conventional hook prostheses allowed more active range of motion in the elbow and forearm and were lighter (p. 90). When comparing conventional prostheses and myoelectric prostheses, eight out of 10 adolescents with unilateral, congenital, below elbow amputations felt that myoelectric prosthesis made them look better and feel more like people. There was also a dramatic increase in social function and self-esteem while engaging in extracurricular activities.

#### Vocational Rehabilitation and Returning to Work

After withstanding a traumatic event that may have resulted in limb loss, many individuals seek vocational rehabilitation (VR) to aid in the process of performing everyday tasks in an adaptive environment. According to the U.S. Department of Education (2004), the purpose of vocational rehabilitation is to “empower individuals with disabilities, particularly individuals with significant disabilities, to achieve high quality employment outcomes to which they aspire and that are consistent with their unique strengths, resources, priorities, concerns, abilities, capabilities, interests, and

informed choice.” VR federal state agencies are found in all 50 states and collaborate with programs that focus on various aspects of each individual’s daily routine.

One of the major concerns for farmers who live in rural areas is their lack of knowledge pertaining to safety and adaptive performance strategies of farm-related tasks after undergoing traumatic limb loss. Many VR organizations do not offer rehabilitative services that serve to educate farmers on adaptive strategies pertaining to farmwork. However, two programs that work together for this specific population of individuals are the USDA AgrAbility Project and VR services. AgrAbility is a program currently offered in 23 states that was initiated by the USDA in 1990 in order to educate, train, and provide specific, technical information to farmers with disabilities (Mathew et al. 2011, p. 94). Vocational Rehabilitation and Returning to Work (Table 4) includes three articles pertaining to VR and how those services directly affect individuals with limb amputations. All three articles were Level V studies, with two articles pertaining to farmers receiving VR services, one article pertaining to both VR services and the AgrAbility project, and one article pertaining to vocational preference among individuals with a limb amputation.

Table 4 – Vocational Rehabilitation and Returning to Work

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitati ons
Mathew, Field, & Etheridge (2011)	This study was intended to assess the benefits and challenges of AgrAbility from the perspective of the SRAP personnel.	Level: V  Design: Survey  Participants: 31 key personnel of the SRAPs	Conducted as a telephone survey among the key personnel of the SRAPs where the states had current active participation in the AgrAbility program. The interviews lasted for 45 minutes on average. Common themes were identified and summarized, and case studies for each state drafted.	The results from the study revealed that interaction in each state is different but all have demonstrated benefits for clientele. The different perspectives and unique experiences of study participants can be used to enhance future relationships between the agencies and provide better service for customers.	N/A

Complete Citation: Mathew, S., Field, W., & Etheridge, S. (2011). Assessing the relationship between AgrAbility projects and state Vocational Rehabilitation Services. *Journal Of Vocational Rehabilitation*, 35(2), 93-105. doi:10.3233/JVR-2011-0557

Table 4 (continued)

Author/ Year	Study Objectives	Level/ Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Mwachofi (2007)	To document the need for, and obstacles to effective access to rehabilitation services by minority farmers. It draws from the findings of a study conducted in the Mississippi delta.	Level: V  Design: Interviews  Participants: 1308 farmers, 18 focus group discussions, 290 service providers, and 72 State VR services counselors from 3 different states	Applying community-based participatory research approach (CBPR) the study trained farmers to conduct interviews and focus group discussions.	Farmers were not aware of VR services or how to access them and VR was not aware of farmers' needs. Felt marginalized and afraid that access to VR services would diminish their ability to earn a living on the farm. The study finds a great need for rehabilitation services that is currently not being met. Close to 27% of those interviewed stated that they had a disability.	N/A

Complete Citation: Mwachofi, A. (2007). Rural access to vocational rehabilitation services: Minority farmers' perspective. *Disability & Rehabilitation*, 29(11/12), 891-902.

Table 4 (continued)

Author/ Year	Study Objectives	Level/Design/ Participants	Intervention and Outcome Measures	Results	Limitations
Willis Harford, & Eddy (1970)	The present study proposed that amputation would be reflected in vocational preferences when samples of amputees were compared to samples of normal subjects.	Level: V  Design: The Strong Vocational Interest Blank [SVIB] Survey, comparison group  Participants: 50 male veteran amputees from the Veterans Administration Outpatient clinic ranging from the age of 30-57, 213 male veterans from the Veterans Administration Normative Aging Project (served as comparison group) ranging from the age of 20-60	The amputees were separated into two groups: lower extremity amputations (leg cases) and upper extremity amputations (arm cases). There were 38 leg cases of whom 28 had below-knee amputations, and 12 arm cases of whom 9 had below-elbow amputations.	The amputee sample scored higher on the following scales: Dentist, Veterinarian, Farmer, Aviator, Carpenter, Printer, Industrial Arts Teacher, and Vocational Agricultural Teacher, and lower on the following scales: Psychologist, Personnel Director, City Public Administrator, City School Superintendent CPA, Accountant, Sales Manager, and Lawyer.	Subsequent studies are required, in order to test other hypotheses regarding the motivational processes underlying occupational preference among amputees.

Complete Citation: Willis, C. H., Harford, T., & Eddy, B. (1970). Comparison of samples of amputee and nonamputee subjects on the Strong Vocational Interest Blank. *Journal Of Counseling Psychology*, 17(4), 310-312. doi:10.1037/h0029689

To summarize the content in Table 4, Matthew, Field, & Etheridge (2011) concluded that because these programs share a common goal to enable independent and productive lives for their clientele, VR agencies are beginning to realize the importance of building a relationship with AgrAbility programs in order to better understand the customer needs and also appreciate the farmer's desire to get back to working on his/her farm (p. 104). Mwachofi (2007) found a serious lack of information in regards to farmers not being aware of VR services and how to access them; also, VR counselors were unaware of the farmers' needs and did not entirely understand the farm culture. The study concluded that although 25.3% of the farmers with a disability stated that they could benefit from VR services, only 3.4% were receiving services and only 5.6% had actually received services (p. 901).

Willis Harford, & Eddy (1970) concluded that the amputees who participated in the SVIB survey chose occupations that required more physical labor (i.e. aviation or farming) as their vocational preference due to possible overcompensation of their abilities after undergoing a limb amputation. However, the amputees who prefer more physically active occupations may indicate that they have reached a stage of becoming aware of their disability and accepting the standards of individuals without amputations.

### Routine and Occupational Therapy

Routine is a concept that is fully integrated into occupational therapy research and literature because it plays a very important part in every individual's day-to-day life and aids in the completion of meaningful occupations. According to the Occupational Therapy Practice Framework, routines are "patterns of behavior that are observable, regular, repetitive, and that provide structure for daily life" (AOTA, 2008). They

encompass each individual's habits and behaviors that serve to help each person engage in their daily occupations. These habits and routines are commonly studied together in occupational therapy literature and are terms that are used interchangeably throughout various professional mediums. All habits and routines are readily accessible to individuals of all kinds of abilities and support the personification of role responsibilities and his or her occupational identity (Kramer, 2007, p. 85).

Routines are sometimes seen as a structure through which both habitual and non-habitual occupations may be organized and have the tendency to vary not only in type but in frequency as well (Clark, 2000, p. 127). In this study, the chair of the Department of Occupational Therapy at the University of Southern California created a synthesis focusing on the definition of habits and routines, what they both do in regards to quality of life, and the potential benefits to consumers with disabilities. The author was able to come up with 5 hypotheses that might have the potential to help guide future research. One of these hypotheses is "they economize action and thought so that the mind can focus on novel events and stimuli, and they provide a stable base on which innovation and creativity can be embroidered" (Clark, 2000, p.132). A foundation must be established so that routine is able to play the important role of constructing the individual's occupational being. This concept is especially important when the individual has experienced a traumatic event that has altered their abilities to re-create a routine that is adaptable to their current condition.

#### Farmers with Amputations and the Importance of Routine

Injuries tend to be inevitable in the agricultural business. According to Reed and Claunch (1998), amputations make up about 11% of all major farm-related injuries, with

fingers and hands being the predominantly injured body parts (p. 129). Reed and Claunch (1998) also believe that a farmer's achievement is gained at personal expense, and many injured farmers believe that they can get back to working in the fields more quickly if their time was not spent in formal rehabilitation; in their study, many of the participants claimed that both physical therapy and occupational therapy were counterproductive to their jobs and were considered to be "barriers" to re-entry into farm work (p. 130); factors such as distance and time constraints are reasons used by farmers for rural non-use of rehabilitation programs (p. 130).

Two members of the Occupational Medicine Program at the University of Washington found that agricultural employment is among the United State's most dangerous occupations. After reviewing the workers' compensation claim data for farmers in the state of Washington between the years 1982 and 1986, the findings indicated that 78 (0.3%) of the 25,097 accepted claims were farmers who suffered from a farm-related injury resulting in a limb amputation (Demers, 1991, p. 1657). Rates of relative risks of illness and injury were calculated by comparing the rate for farmers to the rate for all other paid workers in the state. The study suggests that many farmers in the state of Washington are at higher risk for both occupational injuries, including amputations, and illness than many other workers in the state (Demers, 1991, p. 1657).

Majority of the literature that primarily focuses on upper-limb amputees indicate an enormous variation in the outcomes for these amputees (Davidson, 2002, p.62). Davidson (2002), also believes that "health professionals need to be aware of prospective long-term functional outcomes and potential satisfaction of amputees with their prostheses" (p.62). To some individuals with limb amputations, being able to complete

everyday tasks in their daily routines can be a struggle. Clark (2000) explains that daily routines are "the relatively fixed temporal patterns of sequenced occupations in which one participates during a typical day" (p. 127). If a farmer is to continue working in the farming industry after undergoing an upper extremity amputation, there is an increased likelihood that the occupations will be modified to fit their needs. These changes will have a significant impact on their daily routines and how he or she performs them with the presence of an amputation. Therefore, my grand question is how does a farmer with a major upper-limb amputation describe his or her daily routine since the occurrence of the amputation?

Due to a lack in evidence and overall research on the importance of daily routines of farmers with upper-limb amputations, the purpose of this phenomenological study is to explore the attitudes, beliefs, and needs related to the daily routines of upper-limb amputees who are currently working/previously worked in the farming industry. The information that will be obtained from this study will benefit those especially in the agricultural business as well as in the health care setting to learn more about how these individuals use alternative methods to go about their daily routines.

## Chapter 3

### METHODOLOGY

#### Background

This study was conducted in two parts, with the first part being an informal observation of the participant's primary work setting as well as his largest property of farmland. In this part of the study, the participant granted access to his office area as well as the equipment he uses for farming. From this point, the researcher made the decision to interview the participant to explore the relationship between his amputation and abilities to perform tasks in his daily routine.

Both portions of this study were conducted with the researcher and an occupational therapist working a part-time position for AgrAbility, a program that is funded by the USDA and created as an extension of the Farm Bill of 1990 to assist individuals with physical/mental limitations who are employed in the agricultural business. AgrAbility was developed "to educate service providers who support AgrAbility clients, to provide on-farm technical advice, and to network resources that assist farmers and ranchers with disabilities" (Jorge, 2006, p. 61). The program promotes assistance with accommodations for the active farmer and aims to prevent secondary injuries for the disabled individuals who continue to work in the farming industry.

A literature review was conducted in order to confirm the lack of literature that support these individuals in their line of work and the need for additional research in this area of discipline. Because this study is primarily focused on a specific population, only a

handful of studies were found pertaining to farmers with upper-extremity amputations and daily routine.

### Statement of Purpose

The purpose of this phenomenological case study was to explore the attitudes, beliefs, and needs related to the daily routines of an upper-limb amputee who is currently working or has previously worked in the farming industry. The participant was asked to share his/her daily routine and how the amputation has affected her ability to perform everyday tasks. A face-to-face, semi-structured interview was conducted with the participant and was digitally recorded. The tapes were transcribed verbatim and coded after each session. Observation of the participant's work environment was conducted for field notes and to supplement verbal data.

### Overview of Research Design

The study's research design is a phenomenological epistemology that is blended with an EHP theory approach. This type of methodology was chosen in order to better understand the lived experiences of individuals with upper-extremity amputations based on a paradigm of subjectivity and self-perception of personal knowledge (Lester, 1999). Eastern Kentucky University's Institutional Review Board approved this study in July 2013 for completion by May 2014.

Phenomenology is a philosophical method that was created by German philosopher Edmund Husserl in the late 1800's as a way to establish truth in the lived experience of human phenomena (Roberts, 2013, p. 215). This study was conducted in a way that relates to the importance of meaningful occupation through a phenomenological research approach. "Phenomenology provides a useful method to uncovering the essence

of what occupation means and develop new insights for practice, research, and theory development” (Reed, 2011, p. 309).

The Ecology of Human Performance (EHP) is a theoretical framework that was developed by the occupational therapy faculty members at the University of Kansas as a way to emphasize the importance of context that encompasses the interaction between the person and their tasks. EHP was created as a framework “for investigating the relationship between important constructs in the practice of occupational therapy: person, context (temporal, physical, social, and cultural), tasks, performance, and therapeutic intervention” (Dunn et al. 1994, p. 598).

The purpose of EHP in occupational therapy is to better understand human performance through the interaction between person and the environment, and how it directly affects human behavior within the context of the lived experience. Utilizing this theoretical approach as a tool to further understand the presented case study will reveal the importance of how a farmer with an upper-extremity amputation continues to work on the farm, and also engage in other tasks that are a part of his daily routine. The participant was interviewed after the observational portion of the study. The interview lasted no longer than 45 minutes and took place in the primary equipment barn located on the participant’s farmland, using a semi-structured interview approach. Interviews were transcribed verbatim and loaded onto a computer for analysis. Data was coded and analyzed using both descriptive and in-vivo coding strategies.

### Research Question

How does a farmer with a major upper-limb amputation describe his or her daily routine since the occurrence of the amputation?

## Participant

The case study included a 51 year-old Caucasian male who participated in both the informal observation and the interview process. Inclusion criteria consisted of the participant having had a traumatic bilateral upper-extremity amputation and also currently or previously worked in the farming industry. The selected participant was unrelated to the primary researcher. The participant was recruited via correspondence with AgrAbility and word of mouth from the researcher to the director of AgrAbility.

## Data Collection Methods

Data was collected via field notes and photographs from an informal observational session of the participant's farming property as well as a semi-structured interview between the researcher, the participant, and the occupational therapist from AgrAbility. The interview was audiotaped with a handheld recorder, transcribed verbatim and coded. The researcher utilized a set of questions to discuss throughout the interview, but allowed the participant to carry out each answer in a conversation-like manner.

Questions that were asked during the interview included but were not limited to:

- Describe for me your typical day. What areas do you struggle with?
- If any, what types of modalities do you use when completing daily living tasks and work-related tasks?
- How has having an amputation affected your abilities to complete everyday tasks?
- In what way has the amputation affected your attitudes and beliefs?

- Are you currently active in AgrAbility? If so, how has AgrAbility impacted your daily routine? If not, what activities, events, and/or organizations do you currently participate in?
- Is working in the farming industry your primary source of income for supporting you and/or your family?
- How are you able to operate farming equipment and devices in your daily routine with an upper-extremity amputation?

The participant read and signed the presented consent forms provided by Eastern Kentucky University's Institutional Review Board (IRB) consenting to have the interview digitally recorded and photos taken during the observation session used for this study.

#### Data Analysis

Field notes were written about what was observed at the participant's farm and what the participant said during the session. The interview was transcribed verbatim on a computer. Data from the interview that involved the participant's own experiences and perspectives were analyzed using thematic analysis. In-vivo and descriptive coding was conducted to use direct quotes that were stated by the participant that emerged from the interview. Once these codes were established, they were then grouped into categories based on related ideas and concepts to create themes. Each theme is represented by a quote that was stated by the participant during the interview. Important points collected from the field notes were also placed under the theme that best represents the idea. Photos from the observation session were uploaded and matched with each theme that best represented the codes in each group.

### Trustworthiness

Dr. Maryellen Thompson and Dr. Dana Howell reviewed the data that was collected from this study for accuracy and assisted in placement process of themes and subthemes. All themes and subthemes in this area of study were evaluated and confirmed by the researcher (Emily Fintel).

### Methodological Assumptions

1.) Effectively using a semi-structured interview with the farmer that will generate data that pertains to how the participant engages in tasks that are a part of his daily routine.

2.) Taking photos of the participant's farm will serve as a representation of the specific data collected from the observation session and the conducted interview.

3.) Utilizing comparative methods of observational field notes and interview session will permit the revelation of codes through in-vivo and descriptive techniques to reach a point of saturation within the data collection.

### Limitations

1.) Small sample size that cannot generalize the end results of this study to the wider population.

2.) Researcher is not yet a certified occupational therapist or experienced researcher in this area of study.

3.) Interviewing the case subject with both the researcher and occupational therapist present may have altered answers the individual would have given if only the researcher was prompting the questions.

## Chapter 4

### RESULTS

The following chapter considers the results gathered from the data analysis regarding an individual with upper-extremity amputations and how it affects his daily routine. Results were produced from analysis of the written field notes in the initial observation session as well as the semi-structured interview, through in-vivo and descriptive coding. Themes that emerged from this study revealed a web of ideas that affected the participant and his lifestyle. The results are presented through the Ecology of Human Performance (EHP) theoretical framework. The EHP framework emphasizes the importance of the relationship person and environment, and how this relationship influences human behavior in regards to task performance.

#### Person

Andy H. is a 51 year-old man with a bilateral transradial (below-elbow) upper-extremity amputation. He works primarily as an accounting advisor for a car dealership in his hometown in Kentucky. While the dealership is his primary source of income, Andy spends a fair amount of his time managing his three farms. The observation session and interview was held on Andy's biggest farm, which consists of 113 acres of land as well as his collection of farming equipment, including 7 tractors and two haybines. Andy utilizes his farms to grow various crops, such as corn, soybeans, and alfalfa hay, and also raises cattle for beef production. Although he does not use farming as a way to provide a living for himself, Andy does happen to yield a profit margin for his work on the farm.

Crops probably bring in the most gross income, hay probably makes the most money as far as profit margin on it, because not a lot of people do square bales of hay and corn. I do square bales, so there's not much of a market out there. If there's a market for it, there's not as much supply, because nobody hardly ever fools with square bales. It's time consuming and labor intense.

### *The Accident*

Andy is still able to recall the farming accident that led to his amputation. During the interview, he described how he was in the midst of round-baling hay when the belts in the haybine machine began running crooked. He attempted to figure out what was wrong with the belts, so he cleaned them out and started the process over only to see that the machine was still functioning incorrectly. He then tried fixing the problem using a different strategy:

I climbed up on top of it to see what was causing the problem, and of course I left it running, which you're not supposed to. I slipped and put my hands down out in instinct, to catch yourself when you fall, and went right into the belts and the rollers and got caught.

He continues on with explaining how he attempted to pull out his right arm immediately after getting caught in the machine. Once he pulled his right arm free, he realized that he "had shredded it," and decided to leave his left arm in the machine until he received help. It wasn't until 30 minutes after the incident that a neighbor found Andy caught in the haybine. He describes how his body reacted to the traumatic accident:

Andy: It was a mild day, but I guess your body going into shock makes you thirsty. I was thirsty to death. I told one of the guys that came over...I said "Go get me something to drink." He'd go up to the shop here and got a jug of water.

Interviewer: And would you think that...did you...was it a lot of initial pain, or did it come after?

Andy: More after. I guess I was in shock. I mean, it hurt, but it's hard to describe. You know, you'd think it's like smashing your thumb times a million, but...it's just hard to describe.

The accident occurred on May 31<sup>st</sup>, 2003. Since then, Andy has moved in with his older sister and continues to work at the car dealership and manages his three farms with some outside support from his family and friends.

### *Rehabilitation*

The occupational therapist, who was also in attendance for the observation process and interview, asked Andy if he had any words of advice for healthcare professionals working with somebody with a bilateral upper-extremity amputation. Andy replied by stating, "I think probably that helped me a lot was that they...I guess more getting me into shape. I think you need to be strong to be able to do things." Andy discussed some of the rehabilitation process following the amputation. The therapists that worked with Andy primarily focused on building his overall body strength. He worked on building the muscles across his chest and in his back in order to compensate for the abilities he lost to his bilateral upper-extremity amputation. During this process, Andy was completing many tasks without any prosthetics for assistance.

Andy also discussed how he went through the rehabilitation process at the hospital with a gentleman who also had an upper-extremity amputation. Andy explained how he had never dealt with anyone that had an amputation before, and that they were definitely learning from each other in regards to completing everyday tasks.

### Context

Dunn (1994) defines context as “the physical environment as well as social, cultural, and temporal factors” that all influence behavior through unique lived experiences (p. 595). In order to perform tasks that make up his daily routine, Andy is required to immerse himself in various contexts. Andy lives in the state of Kentucky, where the environment provides optimal conditions for farmwork during the warm seasons. Andy’s work-related tasks are completed on his farms and also at the car dealership, which is his primary source of income for financial stability. Summertime requires Andy to adapt to his surrounding environment by ways of altering his daily schedule in order to complete tasks both on the farm and at the car dealership.

It gets dark early, which is why I hate this time of year.

Andy lives with his sister, who is a vital component in completing self-care tasks in his daily routine, such as doing the laundry, cleaning the house, and managing finances. When a person has limited abilities and skills to engage in everyday tasks, these limitations are constituted by the inability to utilize contextual features to an advantage in support of activity performance (Dunn, 1994, p. 601). After the accident, Andy’s lifestyle had to change in order to fit his needs to complete tasks related to work and leisure. One example of change relates to timesaving strategies in regards to farmwork:

If I'm going to cut hay one day, I'll get my haybine hooked up to the tractor, and I can come over and jump in and take off and cut hay and not have to worry about having anybody around to help me.

Because it would take him longer to spend his morning gathering the correct tools he wants to use in order to complete his work that day, it is beneficial for Andy to prepare for those tasks a few days in advance.

### Tasks

Codes that were collected from the field notes and the interview were divided into groups. These groups are identified by the following key themes: tasks that Andy is able to do and not able to do, and attitudes that pertain to having a bilateral upper-extremity amputation. Throughout the interview and the observation session on the farm, Andy talked about the tasks that he has to complete on a daily basis and how they are incorporated into his routine.

### *Does Complete*

If modifications are available, Andy is able to independently complete many activities of daily living (ADLs) without having to seek any help from family and friends.

Dressing. When it comes to choosing items of clothing to wear, Andy has a wardrobe consisted of items that makes completing the dressing process in the morning much easier to complete. Andy does not have to modify any of what he wears on his upper body because he chooses to wear pullover shirts, such as t-shirts and sweaters, throughout the day. When it comes to dressing his lower body, Andy has to seek modifications in order to manipulate the fasteners on his pants.

Andy: I buy my jeans, take them to the cleaners, take Velcro and they put them on there. That way I don't have to do any buttons.

He wears shoes that slip onto his feet rather than wearing shoes with laces or zippers to fasten them.

Andy: Before I got hurt, I wore shoes that lace up, but I don't wear them now. I just wear slip-ons. My boots, my farm boots, are slip-ons, too.

Bathing/Hygiene. Andy does not have any trouble taking a shower during his morning routine.

Andy: The thing on the shower wall my sister keeps full of shampoo, it's got a knob on it, you can push and it comes out. I do pretty good, I guess. Nobody's told me I stink yet.

He is also able to style his hair without the use of his prosthetics, with a hairbrush and some hairstyling gel.

Andy: I can do it [brush my hair].

OT: You've got a great style!

Andy: Yeah. I put a little gel on it.

Feeding. Throughout the day, Andy will go out to eat for his meals rather than going home to make something to eat. Andy mentioned how even when his sister is home, they choose to eat out at a restaurant.

Andy: I eat out all the time. I eat out when my sister's gone. I eat out when she's here, too. She never was much on cooking...as long as there's a restaurant around, I won't go hungry.

Operating a vehicle. It was stated in the field notes that Andy is able to drive a car with the use of his prosthetics. He drove his car from the car dealership to the farm for the observation portion of the study.

Farming: Equipment used in farming require different manipulators and strategies to operate them during farm-related tasks, such as baling hay and shucking corn. When it comes to the process of operating the farm equipment, Andy is able to independently work the tools in order to complete the tasks.

### *Does Not Complete*

While Andy does happen to function on an independent level when performing some tasks, there are some things that he has trouble doing on his own. Tasks that are incorporated into his morning routine, such as dressing, can be more challenging for Andy to complete without some form of help or support from another person.

Andy: My hardest thing that I have to do is tucking my shirt in. I cannot tuck my shirt in the back because I can't see and I can't feel. That's the hardest thing I have to do.

Not having the ability to complete certain steps in a task is especially prevalent when trying to complete responsibilities on the farm, such as they heavy work that involves hooking up farm equipment to tractors.

Andy: The hardest thing, like I said, is hook up power take-off shafts and hydraulic hoses. So really, actually operating the stuff is not a problem. The hardest thing is getting hooked up.

## Transactions

### *Planning Ahead*

Much of Andy's daily tasks require him to plan ahead for convenience and makes completing these tasks easier to do. Comments were made during the interview that describes the importance of planning ahead in order to carry out duties on the farm, especially when the duty involves operating farming equipment.

Andy: I try to plan ahead. You know, if I know that I'm going to be cutting hay tomorrow, then I'm going to have my haybine hooked up today, when somebody's here for sure. And then tomorrow, I just come and jump in the tractor and take off.

Having the opportunity to prepare for any weather conditions in the upcoming week is how Andy is able to complete many of his responsibilities on the farm.

Andy: Like I said, I hooked up this [*points to equipment*] Saturday when it was raining, because I knew it was going to be pretty Sunday, and I was going to be able to do stuff. And I went out there, and did it.

One of the key strategies that Andy implements to complete daily activities in a timely manner include having his various farming tools already attached to his tractors. The task of hooking up the machine to the tractor involves the help from a family member or neighbor.

Andy: Seven tractors is probably quite a few, but that way I can leave them hooked up to my equipment. Like, if I'm going to cut hay one day, I'll get my haybine hooked up to the tractor and I can come over and jump in and take off

and cut hay not have to worry about having anybody around to help me. Once I'm hooked up, I'm ready to go.

### *Familiarity*

Andy is able to operate on a daily routine because it provides him a sense of familiarity and comfort for what he already knows how to do on his own. He mentioned how a routine allows him to get things done throughout the day while providing him a sense of security that he is still able to complete activities on his own terms. He finds enjoyment in eating out with his friends and being with the same people everyday.

OT: Where everybody knows your name. You go to the diner.

Andy: Yeah, exactly. Exactly! Go to the same places. Everything...get a routine.

OT: Get with the other guys that are eating out. Everyone you know.

Andy: I go to the same places, so you get comfortable with people.

### *Prosthetics*

Andy demonstrated how to perform certain tasks with the use of his prosthetics. When he received his first set of prosthetics, Andy claimed, "I really didn't have to have any rehab or training, just seemed natural." He explained how he initially had body-powered prosthetics, but eventually switched to myoelectric prosthetics because they were more efficient and reliable. Andy uses the prosthetics to complete many tasks throughout the day.

Andy: To get dressed, you have to have them. To brush your teeth, use in the bathroom, eat, anything like that. If we go eat at Hardee's, I throw them on to eat.

After his second set had malfunctioned, Andy received his third set of myoelectric arms. Even though they are efficient tools, prosthetics can have the tendency to malfunction if problems arise.

Andy: It [prosthetic malfunction] does happen, probably moisture and sweat because I sweat a lot. And that was a problem with the first two sets. So this set is a lot better.

The prosthetics that Andy uses have interchangeable EDTs (Electric Terminal Devices) to serve for different purposes. Andy explained how he initially had a set of “regular-looking hands,” and wore them at first for vanity, but he was not satisfied with the fact that all they can do is open and close. He felt that the hands were not functional enough for what he has to do throughout the day. He then tried using the hook EDTs and was happy with how well they worked as he completed different tasks during the day. He stated, “They work good. I pick a dime up off the floor.”

Choices about when to use or not use prosthetics. While Andy uses his prosthetics to do many things throughout the day, when it comes to farming, he feels that he is able to farm without having to use them. It was stated in the field notes that Andy would much rather not wear his prosthetics while completing farm-related tasks because “they just get in the way.” During the observation session, Andy demonstrated how he is able to maneuver a tractor without wearing his prosthetics.

#### *Involvement From Others*

Throughout the interview, Andy talked about many times when he involved someone else in helping him with a task during his daily routine.

Family. Because Andy currently lives with his older sister, he explained her role in his life and what exactly she does for him throughout the day. During the time of the amputation, she helped Andy with the farm for a couple of years until he was able to find other people to help him. He stated, “She helped me get most of everything, came out here [to the farm], and helped me.” Some of her current responsibilities include doing the laundry, cleaning, and helping Andy get dressed if he has to wear items of clothing that he is unable to manipulate on his own, such as a button-down shirt or having to tuck his shirt in. He stated, “she helps me get ready if she’s there.” It was also revealed that she does Andy’s finances for both the home and his farms.

OT: Your sister does your finances?

Andy: Yeah. Because the main reason is because once I’m done at work fooling with numbers, I don’t want to fool with it at home.

Andy also explained that his sister will sometimes make weekend trips to Florida to visit family, and he is left alone to take care of himself for those few days. He stated, “I’ve got plenty of shirts and plenty of clean underwear...I can make it until she gets back.” When it comes to cooking, both he and his sister would prefer to eat out. Andy further explained that he, his sister, and their mother grew up living with their grandmother, who did most of the cooking for them. Therefore, he never saw a reason to learn how to cook and prefers to eat out because it fits his routine.

Friends/Neighbors. Andy has many friends and neighbors that are willing to help him with the responsibilities of farming. In fact, he has recently hired someone to do some of the farming tasks for Andy while he works at the car dealership during the day. In the summertime, the young man will work 40, 50, 60 hours a week for Andy, and his

responsibilities include feeding the cows and mixing up feed for them on Sundays to use throughout the week, as well as mowing the lawns on all three of the farms. In the wintertime, there is not much to do on the farm because of the weather, so the young man will only work part-time for Andy.

During the observation session, it was noted that Andy uses a lot of different types of tools and equipment to help him accomplish various farming tasks throughout each season. Therefore, he relies on friends and neighbors to help him with the steps that Andy is unable to complete independently.

Andy: Farm people are good people. If I need something, I go to my neighbor over here, tell him I need to hook up something and he'll come over and hook it up for me.

Insurance. Andy has had to rely on insurance companies to supply him with the prosthetics he uses today. However, the process that involved receiving the prosthetics was not an easy one. Andy explained how he consistently fought with the insurance company because they felt it wasn't necessary for Andy to have prosthetics and denied him the opportunity to have prosthetics.

Andy: Well, I was trying to get my prosthetics, and it was the day before Thanksgiving, and they had denied. And I was talking to some lady at the insurance company, and I know that I just got a job and I shouldn't have said it to her, but I said, "I tell you what, ma'am. Tomorrow, when you sit down and you eat your Thanksgiving dinner and you pick up your food with your hands, you enjoy the hell out of it, because I can't do that. I'd got to have somebody feed me because you won't let me get these prosthetics."

Andy eventually received the prosthetics, but he continues to struggle with finding satisfaction with the insurance company.

Andy: It's ridiculous, insurance. It's a bad thing. It's a good thing, but it's a bad thing.

OT: Yeah. It's not a perfect system, is it?

Andy: No, no. Not good at all. I don't think.

Andy also explained how at one point, his health insurance switched to where they would only pay a maximum of \$2,500 on durable medical equipment, which was not enough to cover the cost of two myoelectric arms. Therefore, Andy and sister decided to switch insurance companies to help with buying his current set of myoelectric prosthetics. While insurance was able to cover Andy's first and third set of prosthetics, it was actually vocational rehabilitation that purchased Andy's second set of prosthetics.

Andy: My arms are about \$50,000 for two of them...it sure was nice to get my arms paid for by voc rehab.

### *Utilization of AgrAbility*

Andy became familiar with the AgrAbility program a couple of years after he got hurt, but he is still torn between using them for support or just continuing on with his current routine.

Andy: A lot of the things that I see that I need are...would help me, I just make it or get somebody to make it. And I know that in AgrAbility, you gotta go through the dealer and all that stuff, and get it approved. So, it's sort of time consuming going through them, but I mean it's a good program.

Overall, the data reveals that there are many factors that have both positive and negative effects on how Andy engages in his daily routine. The primary concept of this study revealed the tasks the participant can and cannot do, and how his attitudes and beliefs impact his abilities to complete or not complete these tasks. Many external components also have an immediate effect on how Andy is able to complete his everyday routine, such as the involvement of others when engaging in tasks that Andy is not able to complete on his own.

### *Attitudes*

The interview with Andy revealed a substantial amount of information regarding his personal attitudes and beliefs towards the situations he has been through since the amputation, some of which being very positive while others reflected a negative point of view. Andy reflects on the concept of farming as being a positive attribute to his life, no matter what he has been through with the amputation. At one point during the interview, Andy stated “I work at the dealership to support my farming habit...stress relief. This is my therapy. I get out here and enjoy this quietness and sunshine.”

On the other end of the spectrum, there are times when Andy becomes frustrated with a situation. He stated, “I still have my moments.” This viewpoint was present even before the accident had occurred. He talked about how he could never live with having an amputation if it were to ever happen to him. It was until he was put into that situation that he changed his attitude about life.

Andy: If they tell me, “You’re going to get caught and almost die and lose your hands,” I’d say, Well, I just hope I die.” You know, who would want to live like that? But when I got caught, I decided I wanted to live.

Andy discussed how difficult it is for him to complete certain daily tasks because of his condition, and that many people do not realize how well they have it to do everyday tasks with ease. In the second half of the interview, Andy stated, “Some things, it doesn’t take you two seconds to do takes me ten minutes to do, and you don’t even think about it.”

Optimism. Andy mentioned multiple times about how optimism plays an important role in the general thought process of completing activities in his daily routine. He talked about how he just had to make the best of the situation he was put in, despite the number of challenges that have been thrown his way since the amputation. He stated, “You gotta be [optimistic]. You can’t let it get you down. You just gotta keep on going and make the best of it.”

He talked about the times when he and his friends would go out to eat at a restaurant and the staff would, at times, treat him differently because of his amputation. However, Andy explained that making the best out of a situation is what keeps him motivated and optimistic about his life.

Andy: A lot of these places I go to, they’ll break in a new waitress. They’ll wait on me, and the guys I’m with will say, “You’ve got to get his wallet out of his pocket.” They’ll be all embarrassed and nervous and stuff, and then we’ll be like “Nah we’re just joking.”

Patience. Andy claims that before the accident occurred, he lacked a lot of patience when completing daily tasks. Since the amputation, he found that he has learned patience through the responsibilities he encounters everyday. He stated, “I didn’t have any patience before, and it taught me patience...it’s given me things that taught me

patience, that's for sure." Being able to remain patient in certain situations has taught him how to cope with his amputation and the challenges that follow. He said, "People tell me that I've done really well coping with it." Because he has learned to properly cope with the challenges in his life, this presents Andy the opportunity to take matters into his own hands and solve the problems that limit him from participating in daily activities.

Andy: Just like anything else I do, just take off and figure it out on my own, usually.

Plead ignorance. Andy discussed how at times he would find someone to do some of the tasks for him so that he would not have to do them on his own. This way of thinking was present in tasks pertaining to self-care and daily living. Andy mentioned how always had a girlfriend, mother, sister, wife, or ex-wife to do these tasks for him. Andy also mentioned how when he was still living with his mother, she would cook and clean for him.

Andy: She spoiled me. She washed my clothes. Really, I could do it if I had to. I've been shown how, but I sort of plead ignorance on it and let somebody else do it all for me.

Tasks not done before amputation. There were moments during the interview where Andy described how people would attempt to have him complete certain tasks that he had never done before the amputation had occurred. He frequently stated, "I didn't do it before, so there's no sense of starting now." He talked about how tasks like laundry and cooking are out of the question because he had never done laundry and cooking in his entire life. Andy explained how during his rehabilitation sessions after the amputation surgery, the therapists would attempt to have Andy try cooking at the facility.

Andy: They had a kitchen there, and they said, “We’re going to teach you how to do this, to cook without hand.” And I’m like, “Well, I didn’t cook with them.

Why would I want to learn how to do that?”

Routine. Having a set routine allows Andy to participate and complete various tasks throughout the day. He mentioned how because he is not typically a “morning person,” Andy will usually go to the dealership around 10 in the morning and work until about 5 or 6 in the evening. After work, he heads over to the farm and does whatever tasks need to be done that day.

Andy: I usually try to go to the dealership everyday just to check bank balances and things like that. Make sure things run smooth, sign anything I need to, and I’ll head straight over to the farm.

Working on the farm requires Andy to alter his schedule so that he can tend to his farm-related tasks; however, these tasks are synchronized with the weather and emerge during specific times of the year.

Andy: In the summertime, I’ve been over here at 2 o’clock in the morning loading hay...I usually come to the farm and mow grass or do whatever needs to be done this time of year...if we have hay to bale or something like that, I work until it gets done, basically until dark or late...it just varies with the time of year.

Familiarity. Andy is able to operate on a daily routine because it provides him a sense of familiarity and comfort for what he already knows how to do on his own. He mentioned how a routine allows him to get things done throughout the day while providing him a sense of security that he is still able to complete activities on his own

terms. He finds enjoyment in eating out with his friends and being with the same people everyday, which confirms this sense of familiarity that encompasses his daily routine.

OT: Where everybody knows your name. You go to the diner.

Andy: Yeah, exactly. Exactly! Go to the same places. Everything...get a routine.

OT: Get with the other guys that are eating out. Everyone you know.

Andy: I go to the same places, so you get comfortable with people.

*Thinking about the future.* As technology changes, it is important that Andy begins to think about what his options will be in regards to using prosthetics in the future. He recently visited a prosthetics store and learned that the company is coming out with hands that have fingers that work individually to provide more functional movement for the user. Andy also mentioned how hopeful he is about the future of prosthetic development and how much more research is focusing on how to provide for these individuals with amputations.

Andy: That's one good thing about the Iraq-Afghanistan wars...seems like there's a lot more research into prosthetics, not that those guys are coming home.

Hopefully...someday where it'll be almost like having a hand.

## Chapter 5

### DISCUSSION AND CLINICAL IMPLICATIONS

#### The Problem

While occupational science and occupational therapy literature focuses on individuals with disabilities and undertaking the challenges of performing daily activities through meaningful occupations, there is currently little to no evidence available that primarily addresses the needs of upper-extremity amputees and engaging in farm-related tasks. Being able to return to farmwork after a serious injury, like an amputation, is a concept that is prevalent in areas across the country where farming plays an essential role in the general lifestyle of the community. As this study revealed, one individual with a very unique upper-body amputation had to change his way of performing daily activities and adapting to new strategies in order to continue working on his farms.

No literature was found that looked at the overall effects of occupational therapy on farmers with upper-extremity amputations and how their services provide rehabilitation that specifically focuses on tasks related to farmwork. Additionally, no research was found describing both the physical and mental impact of an upper-extremity amputation and how it changes the routine for those individuals who desire to engage in agricultural activities as part of their daily routine.

#### Purpose

The purpose of this study was to investigate the attitudes, beliefs, and needs related to the daily routine of an individual with an upper-limb amputation who is either

currently working or has previously worked in the farming industry. The primary focus was to gather information from a farmer with an upper-extremity amputation that encompassed the lived experience of his/her daily routine since the occurrence of the amputation. The Ecology of Human Performance (EHP) was used as a theoretical framework to view the data collected, which revealed specific information regarding the participant's accident that resulted in his bilateral upper-extremity amputation as well as how he changed ways of engaging in daily activities in order to fit his needs.

This research will help professionals gain access to an individual's lived experience that can help better understand how to center the rehabilitation/recovery process around not only the essential activities found in one's daily routine, but also around the client's specific needs regarding agricultural work and having the tools to help those individuals return to engaging in activities on the farm.

#### Relationship to the Literature

Statements that were made by the farmer in this study support the idea of farming as an essential and meaningful occupation in one's daily routine. The participant's reflection of his accident and how the rehabilitative process affected his beliefs and values centering on his performance of daily tasks validates farming as an essential occupation in his life. Results from the study add to the literature on the importance of prosthetics and making decisions based on the functionality of prosthetics while engaging in certain occupations, specifically those related to farming. The lack of available evidence surrounding prosthetic use during more laborious work, like farming, was addressed in this study. Even though he utilizes myoelectric prosthetics while performing daily occupations, like dressing and eating, Andy chooses not wear them during farm-

related tasks because they create problems rather than support his abilities to complete activities on the farm. This concept provides evidence that supports both the benefits and limitations of prosthetic use during vigorous activity and whether or not the individual finds them to be helpful or if they just get in the way while engaging in daily activities (Heckathorne et al. 2011).

Literature focusing on the significance of Vocational Rehabilitation (VR) in the rural communities shows an unmet need for their services in this population. Research indicates that VR services typically do not have the information on the needs of minority farmers, while farmers do not have detailed information about the VR and the process of accessing services (Mwachofi, 2009, p. 22). Those who are familiar with VR are afraid that access to their services would diminish their ability to continue earning a living on their farm (Mwachofi, 2007).

Collaboration between VR and rural organizations, such as AgrAbility, exists to provide farmers with disabilities access to education and assistance to help minimize, or even eliminate, any obstacles that inhibit success in agriculture-related occupations. While the participant is familiar with AgrAbility and the benefits of being associated with the program, he is still unsure about utilizing them for support because he is already comfortable with the routine he has set for himself after going through the accident and rehabilitative process. The idea that some farmers with disabilities may not ever utilize programs like AgrAbility adds to this literature because they already have their own ways of engaging in farmwork.

### Significance of the Study

This study will add to both occupational science and occupational therapy literature because it is centered on how an upper-extremity amputation can change the overall beliefs and attitudes of an individual who engages in both daily activities and tasks related to farming. It also examines the impact of the rehabilitative process on farming as a primary occupation and the use of adaptive equipment in regards to tasks seen in agricultural work. Whether the farmwork is for leisure or for productivity, this study provides a glimpse into filling a void that is currently seen in the lack of research available regarding the importance of occupational therapy on those farmers with amputations who desire to return to farmwork.

Because this was only one study that focused on an amputee who achieved success in performing his meaningful occupations, this does not necessarily guarantee that all other farmers with similar injuries will adapt in the same way. While this research study will provide professionals a better understanding of one individual's needs and attitudes towards activities found in their daily routine. It will provide a base as to how one person's daily routine may compare to other farmers with upper-extremity amputations' routines, and whether or not they continue to engage in farmwork as a meaningful occupation.

### Implications to Occupational Therapy

The need for occupational therapy in the recovery process for disease and/or injury is essential because it allows each individual to participate in the things that are most important to them through the therapeutic use of daily activities. Research shows that occupational therapists should not only address activities of daily living (ADLs), but

also those occupations that are meaningful to the individual receiving therapeutic services (Wensley et al. 2012, p. 86). While an occupational therapist may focus primarily on the basic daily occupations that make up an individual's routine, it is also important that the therapist remains client-centered throughout the rehabilitative process. In this case study, farming is considered to be the most meaningful occupation that centers the participant's attitudes towards performing other daily tasks in his routine. During the interview, Andy explained that farming is a major stress reliever, and considers the occupation his personal form of therapy.

Significant occupations, like farming, are an area occupational therapists can address to ensure that people can still engage in occupations that are meaningful to them. One of the common themes seen throughout the interview process focused on optimism and how it positively affected the participant's thought process while engaging in activities that compose his daily routine. Occupational therapists can assist in providing motivation that is essential for individuals who, like Andy, may endure a serious injury, such as a limb amputation, that could possibly inhibit them from engaging in meaningful occupations. Despite disability, encouraging an injured farmer to engage in their farming routine can help to restore normalcy in their life and to provide support in those everyday activities found in their daily routine.

#### Recommendations for Future Research

Additional research needs to be conducted in order to build on this research study in order to explicate the need of farmers with amputations to receive occupational therapy services during their rehabilitative process. Studying the recovery process and also the introduction of prosthetics/adaptive equipment use could possibly determine if the

individual with an upper-extremity amputation would return to farming and utilizing that information in practice may aid in the overall treatment process of engaging in everyday occupations.

This research may be beneficial for those specific populations who live in rural communities and where injuries are prevalent in the farming industry. Because this study is only centered around one individual living in rural Kentucky, it would be beneficial to conduct a study with a larger population of people who have upper-extremity amputations and work in the farming industry in other geographic regions of the United States. Expanding to other parts of the country may cover a variety of farmers with upper-limb amputations and how their daily routines compare in regards to farmwork.

Another area of study that may benefit from the information collected from this phenomenological case study is the influence of limb amputation on those who are recently disabled as compared to those who have been living with their amputation for a longer period of time. Some differences that may arise between the two comparing groups include the recovery process, the decision to utilize prostheses and/or adaptive equipment during activity performance, any changes in attitudes or their general outlook on life after the injury, and whether or not they continue to engage in meaningful occupations through adaptive strategies and changes to their daily routine.

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