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BOSTON UNIVERSITY

SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

UNLOCKING BIOPSYCHOSOCIAL HAND THERAPY

by

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Submitted in partial fulfillment of the

requirements for the degree of

Doctor of Occupational Therapy

2023

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DEDICATION

I would like to dedicate this work to my spouse Joseph, my children Lucy and Graham, and my parents, Bonnie and Mark Newcombe.

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UNLOCKING BIOPSYCHOSOCIAL HAND THERAPY

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ABSTRACT

Physical injuries to the upper extremity can have a drastic impact on an individual's daily functioning affecting their psychological well-being, social participation, and ability to perform valued activities such as self-care, work, and leisure tasks. Due to the wide range of factors affecting a person who is recovering from an upper extremity injury, therapists treating these individuals must understand, help identify, and address the areas impacting function to support and maximize participation in and performance of valued occupations. However, often psychosocial aspects of care go unaddressed when biomechanical interventions are prioritized, which is primarily attributed to therapists' lack of knowledge, confidence, or skills in this area. *Unlocking Biopsychosocial Hand Therapy* is a continuing education unit (CEU) course aimed at filling therapist gaps in knowledge and service provision, specifically regarding psychosocial factors, when treating clients with upper extremity injuries or conditions. The long-term goals of this innovative program are to improve client outcomes and to increase therapist prioritization of psychosocial factors on par with biological factors.

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LIST OF ABBREVIATIONS

ADL .... Activities of Daily Living

AOTA .... American Occupational Therapy Association

APP .... Approved Provider Program

ASHT .... American Society of Hand Therapists

BPS .... Biopsychosocial

CBT .... Cognitive Behavioral Therapy

CEU .... Continuing Education Unit

CHT .... Certified Hand Therapist

CMC .... Carpometacarpal

COTA .... Certified Occupational Therapy Assistant

CRPS .... Complex Regional Pain Syndrome

HTCC .... Hand Therapy Certification Commission

ICF .... International Classification of Functioning, Disability, and Health

IRB .... Institutional Review Board

LMS .... Learning Management System

OTP .... Occupational Therapy Practitioner

PT .... Physical Therapist

PTSD .... Post-Traumatic Stress Disorder

UE .... Upper Extremity

WHO .... World Health Organization

CHAPTER ONE – Introduction

Chapter 1: Introduction

Physical injuries to the upper extremity can have a drastic impact on an individual's daily functioning affecting their psychological well-being, social participation, and ability to perform valued activities such as self-care, work, and leisure tasks. In 2019, time lost from work due to upper extremity injury or illness comprised 32% of cases, which is the majority of total cases according to the United States Bureau of Labor Statistics. This exceeds the number of cases related to injury and illness from other body parts such as the head (9%), neck (1.3%), trunk (21%) and lower extremities (24.4%). In addition to causing physical impairment or disability, upper extremity injuries have psychological and social impacts. In fact, Roesler et al. (2013) found that psychological factors such as negative affect were more indicative of a person's ability to return to work than the severity of the injury itself. "The psychosocial aspects of a hand injury are often the ones that create barriers to successful adjustment and must therefore be addressed in conjunction with the physical aspects of a hand injury" (Hannah, 2011, p. 95). However, the psychological and social impacts are less frequently addressed in upper extremity rehabilitation settings, such as hand therapy clinics, where treatment of physical factors impacting function are prioritized. This can lead to problems such as chronic pain, increased healthcare costs (Chown et al., 2018), prolonged therapy visits (Berstein et al., 2019), and overall decreased health and well-being.

Nature of the Problem and Contributing Factors

The key factors to these problems include therapists' heavy reliance on a

biomechanical model of practice and other rehabilitation practice factors, and lack of addressing patient psychological and social factors that impact outcomes.

Therapist and Practice Factors

Model of Practice.

Acknowledgement of the psychosocial impacts of upper extremity injuries is not a novel concept; however, the majority of hand therapists primarily provide services using a biomechanical frame of reference (Chown et al., 2018). Van der Velde et al. (2016) point out several factors inhibiting a therapist's ability to address psychosocial factors including but not limited to time constraints, lack of knowledge or skills regarding psychosocial assessments and interventions, difficulty engaging the client, difficulty prioritizing interventions for a particular session, and lack of resources. Additionally, there is lack of knowledge regarding reimbursement for psychosocial interventions provided in the hand therapy setting. This is important to understand because when working in for-profit organizations, which most upper extremity specialists do (American Society of Hand Therapists, 2016), billable occupational therapy services are easier to justify than services that are not.

Lack of Knowledge, Skills, or Resources.

Individuals with upper extremity injuries are often seen by specialists or Certified Hand Therapists (CHT) who, according to the Hand Therapy Certification Commission (HTCC) (n.d.), are occupational or physical therapists who have at least three years of clinical experience, can document 4,000 hours in direct practice in upper quarter rehabilitation and who pass an extensive exam of skills and theory related to upper

extremity care. The majority of these clinicians are occupational therapists, comprising 86% of CHTs worldwide (Hand Therapy Certification Commission, n.d.). Unfortunately, there is minimal emphasis on the education recommendations surrounding the psychosocial implications of hand injuries and related treatment recommendations (Schier & Chan, 2007; Sivagurunathan et al., 2019).

In the 2021 Certification Handbook, HTCC provides a "Test Blueprint" which outlines the "relevant tasks and knowledge areas that have been identified as essential to the practice of hand therapy" and serves as an invaluable resource for CHT exam test takers (p. 16). There are three references to psychosocial factors including "physiology and psychology of pain", "psychological reactions to impairment", and "anticipated physiological and psychological effects of therapeutic interventions" (p. 18); however, this comprises only a scant fraction of the overall topics covered by the exam which is dominated by concepts of anatomy, kinesiology, orthoses, and post-surgical guidelines. In another HTCC recommended resource, the American Society of Hand Therapists (ASHT) Text Prep for the CHT Exam, 3rd Edition (2014), there are no chapters dedicated to information regarding assessment or interventions regarding psychosocial factors in clients with upper extremity injuries. This sends a message to the hand therapy community that psychosocial concerns are not as relevant to hand therapy practice as biological ones.

Benchmark journal articles, such as *Hand Therapy Management Following Mutilating Hand Injuries* (2003), focus on outlining a standard of care based on biological healing including treatment guidelines; however, it fails to present resources or

approaches for facilitating psychosocial adjustment. The article acknowledges psychological status as one of the "primary factors that can affect the healing process and ultimate outcome" and that "the therapist must take all these factors into consideration to formulate the optimal treatment approach for each case" (p. 133) but exclude formal guidance on how achieve this.

This same trend is true for continuing education seminars and at national and state conferences dedicated to upper extremity topics. The role of the upper extremity specialist in treating psychosocial factors is shadowed by topics relating to anatomy, surgical techniques, biomechanics, and exercise interventions. This impacts therapists' prioritization, knowledge, and implementation of psychosocial assessments and interventions, as many therapists look to their national and local conferences for continuing education opportunities and to set the standard for practice.

In a pilot study conducted by Chown et al. (2018), they found an inverse correlation between experience level of therapists and likeliness to refer clients to psychosocial services; less experienced therapists were more likely to refer to psychosocial services. These authors hypothesized that a possible explanation for this is that less experienced occupational therapy practitioners have improved awareness of psychosocial factors and emphasize holistic care whereas seasoned hand therapists become more biomechanically focused through their years in upper extremity practice and thus deemphasize psychosocial care. "Psychosocial factors remaining untreated post injury may result in increased time and money demands on patients, therapists, employers, and third-party payers when addressing long-term effects" (Chown et al.,

2018, p. 536).

Difficulty Prioritizing Interventions and Time Constraints.

Limited time and duration of therapy sessions impacts therapist prioritization of treatment interventions, especially when dealing with issues of high medical acuity, such as open wounds. Vranceanu et al. (2017) found that orthopedic surgeons listed time constraints as the number one barrier to referring patients for psychological treatment. Hamasaki et al. (2018) suggest that the same is true for hand therapists. Upper extremity rehabilitation is often delivered in an outpatient setting and most frequently in hospital-based clinics, but it may also be delivered in a physician-owned, therapist-owned, or corporate-owned practice (American Society of Hand Therapists, 2016). Each of these settings functions differently in terms of the duration of individual treatment sessions.

The American Society of Hand Therapists (2016) found that 43.6% of CHTs in the United States spend 46 to 60 minutes in initial evaluation sessions, with 25.9% of therapists spending 31 to 45 minutes. 40.2% of therapists spend 46 to 60 minutes in follow-up treatment sessions and 38.4% spend 31 to 45 minutes. The majority of hand therapists do not utilize a therapy extender such as a certified occupational therapy assistant (COTA) or rehabilitation aide (54.5%) and 39% of hand therapists work with only one or two colleagues, while 37% are the only hand therapist in their setting. This data suggests that there is no standard timeframe for evaluation or treatment duration in hand therapy settings in the United States. Treatment provided by a single therapist scheduled every 30 minutes with a new client versus every 45 or 60 minutes will differ. For example, if the client has an open wound, which at a minimum typically requires a

dressing change, instruction in exercises or orthotic use, and patient education to minimize the risk of infection, the therapist may run out of time to provide other interventions. Sometimes a therapist only has 25 to 30 minutes to provide care. In these situations, the therapist may prioritize biomechanical interventions over the client's psychological or social concerns.

Clinicians also have difficulty pivoting from biomedical to psychosocial issues or how to prioritize one aspect over another (Van der Velde et al., 2016). In clinical practice it is not uncommon for a patient to attend a therapy session demonstrating a multitude of factors including emotional lability, pain, stiffness, wound drainage, swelling, decreased range of motion, anxiety, or distress. Clinicians must weigh treatment options and decide which interventions to prioritize. This may be influenced by a variety of factors including medical acuity, evidence-informed practice, results of assessments or outcome measures, time constraints, or revenue potential.

Ladds et al. (2017) point out that hand therapists play an important role in the early screening of psychological symptoms and identification of individuals who may need additional support following their traumatic experience. Fortunately, evidence is available to help breakdown some of these barriers. For example, Westenberg et al. (2018) provides evidence supporting the benefit of a brief, 60-second mindfulness exercise to reduce pain and distress prior to receiving care within the context of a busy, upper extremity clinic. Research also suggests that there are indicators for when to screen for difficulties with psychosocial adjustment to an upper extremity injury. Roesler et al., (2013) identified a combination of variables that signify when a patient with a hand

injury is “at risk” starting at four weeks post-injury. Hannah (2011) further points out that the three-month marker is a good time for referral to outside services. Therapist knowledge of these timelines and appropriate assessments will create a foundation for establishing a standard of care for approaching treatment of psychosocial issues.

Evidence highlights the impact of psychosocial factors on hand rehabilitation and suggests that therapists can use more comprehensive models, such as the biopsychosocial model, to maximize adaptation, early recognition and treatment of psychosocial barriers following upper extremity injuries (Hamasaki et al., 2018; Hannah, 2011; Ladds et al. 2017). Due to the wide range of factors affecting a person who is recovering from an upper extremity injury, therapists treating these individuals must help identify and address these barriers to support physical and psychosocial adaptation with the long-term goal of maximizing participation in and performance of valued occupations.

Psychological Impacts

Ladds et al. (2017) reveal that following a traumatic physical injury, people often report symptoms of acute stress including anxiety, hyperarousal, flashbacks and avoidance, which over time, may persist and develop into post-traumatic stress disorder (PTSD). The most common psychological impacts related to traumatic upper extremity injuries include but are not limited to pain, fear, avoidance, changes in body perception, depression, and anxiety (Babatunde et al., 2020; Cochrane et al., 2022; Hamasaki et al., 2018; Ladds et al., 2017; Pittermann et al., 2014; Roesler, 2013). Negative affect or ineffective coping skills for dealing with impairments such as deformity and pain can adversely affect return to work, relationships, body image and functional abilities

(Babatunde et al., 2020; Hamasaki et al., 2018; Hannah, 2011; Ladds et al., 2017; Roesler, 2013; Turkington, Dempster & MaGuire, 2018).

Pain, Fear and Avoidance.

Following injury to an upper extremity, physical changes occur such as pain, edema, wounds, disfigurement, or amputation. Individuals may avoid an injured or disfigured upper limb. Gaze aversion occurs when patients are unable to look at their injured extremity and therapists may observe a client hiding their scars with a bandage, wrap, glove, scarf, or splint (Hannah, 2011). Avoidance can also be related to a fear of experiencing pain, which can also be associated with negative affect (Crombez et al., 1999). Crombez et al. (1999) found that pain-related fear and fear of movement, injury, or re-injury in particular, is a risk factor for disability. In fact, they found a subgroup of individuals whose level of disability was primarily determined by pain-related fear more so than their biological, medical, physical, or actual pain status (Crombez et al., 1999).

Changes in Self Perception/Body Image.

Negative self-perceptions are one of the most frequently reported difficulties by people with visible upper extremity differences (Rumsey and Harcourt, 2004). Starting in childhood, an individual develops body image which has an impact on their behavior and is influenced by the sociocultural environment. “Body image consists of subjective and perceptual experiences and contributes to how an individual feels about ‘self’, processes information and behaves” (Shearsmith-Farthing, 2001, p. 387). Hunter et al. (2013) found in their narrative study of 13 women, who sustained mild to moderate burn injuries to their extremities, torso, or face, that their degree of dissatisfaction and distress was

related more to body image and self-perceptions, than to the size and severity of the burn. Therapists working in upper extremity rehabilitation settings have a role in assessing and addressing individuals' "self-beliefs relating to body image that governed the client's life before injury and adapting them to life post-injury" (Ellis et al., 2021, p. 238).

Negative Affect and Ineffective Coping Skills.

Negative affectivity, or the predisposition toward negative thoughts and feelings, is a risk factor for ineffective coping skills and low life satisfaction (Talaei-Khoei et al., 2016). Talaei-Khoei et al. (2016) found an association between negative affect, increased pain, and decreased engagement in daily life activities. They assert that early identification and treatment of negative affect may even be more cost effective than biomedical interventions such as surgery or medication. "People who learn how to optimize their affect are likely to manage stress and distress better, be more adaptive and resilient, and use fewer healthcare resources" (Talaei-Khoei et al., 2016, p. 571).

Social Impacts

Social Interactions.

Upper extremities play a critical role in social communication and interactions, which vary greatly across cultures. People with visible differences frequently report difficulties with social interactions (Rumsey and Harcourt, 2004). The reason for these difficulties is multifactorial and may be rooted in cultural or individual personal beliefs, or psychological factors which can affect communication. For example, in addition to American Sign Language (ASL), people in the United States use hand gestures to communicate a variety of nonverbal information such as holding one's hand to convey

care, extending the middle finger to convey dissatisfaction, extending the index and middle finger to communicate peace, or using one or both hands clutched to the throat to signal choking.

Changes in Roles and Routines.

Pittermann et al. (2021) point out that upper extremity injuries also have a psychosocial effect on others. Family members, significant others, friends, or co-workers of the individual affected may become "overly protective or self-conscious and change their behavior in the presence of the injured" (p. 14). Often both the individual with the injury and members of their social circle feel they have to adjust their roles and routines which may lead to challenges at home, with peers, at work or at school (Whalley & McAndrew, 2020). For example, a hairstylist recovering from an elbow fracture may not be able to return to work initially, thus creating an increased work burden on co-workers. The hairstylist may not be able to cook or perform childcare duties, thus creating an increased burden on friends and family. This person may struggle with the loss of their valued roles and occupations which affects their financial security, mood, self-perception, independence, and social interactions. "These challenges affect a person's motivation to participate, disturbing the spiritual process of meaning making and their life narrative" (Whalley & McAndrew, 2020, p.15)

Transportation or Financial Barriers

Affording healthcare services and accessing those services can also impact a person's recovery from an upper extremity injury or condition. Often individuals are referred to rehabilitation services where participation in therapy sessions per the

established plan of care is integral to successful outcomes. For example, a patient in the early weeks of tendon healing is typically recommended to attend therapy two to three times weekly for wound and edema management, passive joint range of motion, tendon gliding exercises, and instruction in self-care. However, if, for example, their copay is too high, they do not have insurance, they are unable to find reliable transportation to the clinic or they are unable to take time off from work, these factors can become a barrier to participation. In 2016, the American Society of Hand Therapists (ASHT) surveyed over 550 hand therapists across the United States to assess hand therapy practice trends. 80% of therapists reported that their patients do not attend the recommended number of therapy follow-up visits. The primary reasons cited for this included an inability to afford the copay (84.3%), transportation issues (62.7%), lack of insurance (44.7%) and inability to obtain insurance authorization (43.9%) (ASHT, 2016).

Proposed Solution to Address Problem

The purpose of this innovative project is to fill therapist gaps in knowledge and service provision regarding psychosocial factors for clients with upper extremity injuries or conditions through development of a continuing education unit (CEU) course. The long-term goal of this project is to maximize successful patient outcomes by increasing therapist knowledge, confidence, and skills in assessing and addressing psychosocial factors. The course, *Unlocking Biopsychosocial Hand Therapy*, will be geared toward occupational therapy practitioners (OTPs), physical therapists (PTs) or Certified Hand Therapists (CHTs) with at least one year of experience working in an upper extremity rehabilitation setting. As discussed, for decades researchers and clinicians have

acknowledged the importance of addressing psychosocial factors alongside biomedical factors in upper extremity rehabilitation settings, however, implementation of a biopsychosocial or similar model of practice remains limited.

This project will highlight the role that therapists working in upper extremity settings can and should play in assessing and addressing these factors as part of a comprehensive treatment plan to promote a patient's psychosocial adjustment. "Adjustment improves when this complex interplay between physical, psychological, and social elements are acknowledged" (Hannah, 2011, p.95). The first component of the *Unlocking Biopsychosocial Hand Therapy* course will provide an educational overview regarding psychosocial factors in upper extremity practice. Clients do not always discuss the psychosocial impacts of their injuries, such as anxiety or depression; however, participants will learn how to assess these factors along with physical and social factors, via the impact they have on occupational performance and participation. By assessing factors that influence participation and performance in activities, such as return to work, and prioritizing psychological and social factors on par with biological factors, clinicians will be able to provide more holistic care.

Another component of the *Unlocking Biopsychosocial Hand Therapy* course will address the current prohibitive factors and practice trends that contribute to a lack of psychosocial assessment and intervention in outpatient hand therapy clinics. This component will assist participants to understand and identify the barriers to care within their own practice settings and provide them with resources and opportunities for meaningful discourse aimed toward transforming their perspectives regarding the

importance of a biopsychosocial approach to care. Finally, this component of the *Unlocking Biopsychosocial Hand Therapy* course will also cover intervention strategies within the occupational therapy scope of practice that can be easily incorporated into upper extremity practice. This course will be delivered through the author's own continuing education company, Right Hand Therapy, LLC.

CHAPTER TWO – Project Theoretical and Evidence Base

Overview of the Problem

Upper extremity injuries are defined as injury to the hand, elbow, arm, shoulder, or shoulder girdle which encompasses the clavicle and scapula. Injuries may be considered acute, such as those caused by surgery or a specific traumatic event, or chronic. Chronic injuries are those that occur over time and may be caused by overuse or repetition. Upper extremity conditions may be location specific, such as lateral epicondylitis, rotator cuff tendonitis, or digital amputation, or may include diseases, illness or disorders such as arthritis, Ehlers-Danlos syndrome, or Dupuytren's disease. Some upper extremity conditions are congenital, such as syndactyly or congenital upper limb deficiency, but may also be acquired such as brachial plexopathy or hemiplegia.

Biomedical and Biomechanical Models

The biomedical model has been the dominant approach to healthcare for decades (Engel, 1977). The premise of this approach is concerned with the relationship between biochemical aspects of the human body and assumes that all disease or deviations from health can be explained by measurable biological (somatic) variables and thus eliminated by addressing those bodily structures and processes (Kielhofner, 2009). The issue is "that since "disease" is defined in terms of somatic (biological) parameters, physicians need not be concerned with psychosocial issues which lie outside medicine's responsibility and authority." (Engel, 1977, p. 129).

Occupational therapists specializing in hand therapy typically work under the auspices of a hand surgeon who specifically deals with injuries and conditions affecting

the upper extremity. Prescriptions for hand therapy services prioritize biological interventions such as manual therapy, orthotic fabrication, and physical agent modalities, and therapists often have high productivity demands with limited time frames in which to perform interventions. Hand therapists heavily rely on a biomechanical approach to care which deals with problems related to the musculoskeletal system, peripheral nervous system, integumentary system, lymphatic system, and/or cardiovascular systems that limit functional motion in occupational performance (Kielhofner, 2009).

Biopsychosocial Model

In 1977 Dr. George Engel proposed a new multisystem approach to healthcare, one that would consider social, psychological, and behavioral subsystems on par with the biological aspects of illness. The biopsychosocial model has gained significant awareness and acceptance over the last 30 years, however, implementation and use in clinical practice remains limited (Suls & Rothman, 2004). According to Engel (1977) the first major principle of the biopsychosocial model proposes that intervention should be individualized and client-centered, and intervention should consider multiple aspects including psychological, social, cultural, and concurrent biological factors. Next, the clinician must use a scientifically rational approach to establish a relationship between biochemical or neurophysiological processes (clinical and laboratory data) and behavioral and psychosocial factors (the patient's verbal communication of their symptoms). Third, biological, social, and psychological factors interact with each other to influence the course of a disease (perception of onset, course, and severity). Fourth, psychological and social factors are pivotal in determining when and if a patient with abnormal

biochemistry accesses healthcare. Fifth, “rational treatment”, as explained by a biomedical model, does not necessarily restore a person to health even if their biological abnormality has been corrected. Finally, the physician/client relationship influences the therapeutic outcome “for better or for worse” and “the healing powers of [the] physician requires psychological knowledge and skills, not merely charisma” (Engel, 1977, p. 132).

Understanding hand and upper extremity injuries and conditions through a biopsychosocial (BPS) lens seems logical and necessary, however can be difficult to implement in practice. There are four overlapping elements consistent with a biopsychosocial approach which consist of physical, psychological, social and rehabilitation practice factors, which can affect a person's successful recovery from upper extremity injury or condition. Successful recovery is defined as one’s ability to engage and participate or return to engagement and participation in valued, expected, or needed occupations such as work, leisure, self-care, and play. These four elements should be considered both independently and in light of their associations with one another (see Figure 2.1). Additionally, the International Classification of Functioning, Disability, and Health (ICF) utilizes the biopsychosocial perspective. This framework is interdisciplinary and is accepted worldwide, enabling a wide variety of clinicians to standardize documentation of client functioning.

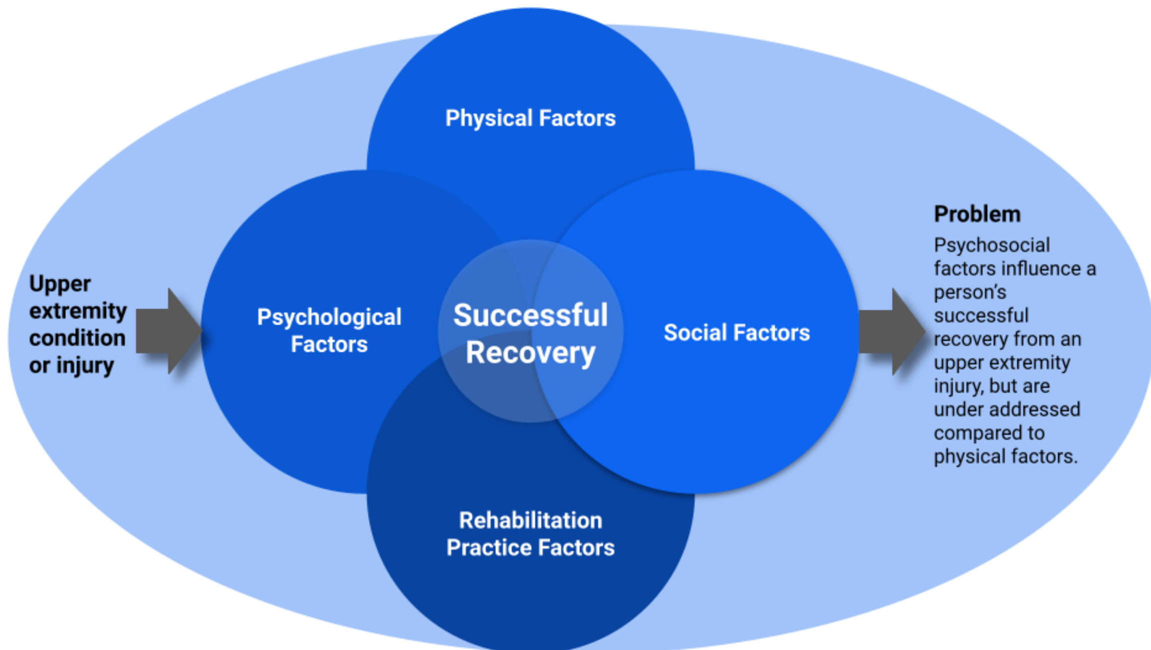
International Classification of Functioning, Disability, and Health (ICF)

In 2001 the World Health Organization (WHO) developed the ICF, an international and interdisciplinary conceptual framework to understand, organize, and communicate the “dynamic interaction between a person’s health condition,

environmental factors and personal factors" (World Health Organization, 2013, p. 3). It blends medical and social models of practice to create an adapted biopsychosocial model approach to understanding functioning and disability across the lifespan. The ICF is organized into two main parts namely: functioning and disability, which entails body functions, body structures, activities, and participation; and contextual factors such as environmental and personal factors (World Health Organization, 2013). The major principles of the ICF include universality (applicable to all individuals regardless of health condition or context), parity (disability is not differentiated by physical versus mental conditions), neutrality (use of neutral language), and environmental influences (physical and social factors) (WHO, 2013).

Figure 2.1

Explanatory Visual Model of the Problem



Physical Factors

Physical factors include but are not limited to aspects such as pain, healing tissues, and changes to the physical body or appearance, for example due to the presence of wounds, edema, disfigurement, and decreased mobility and function. Pain, in particular, has a negative effect on a person's psychological and social well-being, most often correlating with depression and symptoms of posttraumatic stress disorder (PTSD) (Archer et al., 2016; Handford et al, 2017; Hsu et al., 2019; Ladds et al., 2017; Løvstad et al, 2020; Kristjansdottir et al., 2020; Mayland et al., 2015; Miller et al., 2017; Pelletier et al., 2020; Sposato et al., 2019). Of note, the majority of the studies examining the effect of upper extremity pain on psychosocial factors come from injuries acquired traumatically versus non-traumatic orthopedic conditions.

Aside from depression and PTSD, physical factors are also associated with increased anxiety (Mayland et al., 2015; Sposato et al., 2019), shock (Sposato et al., 2019), anger (Sposato et al., 2019), hopelessness (Dunpath et al., 2015), reliving trauma (Dunpath et al., 2015), and loss of independence (Dunpath et al., 2015). In terms of social factors, physical impairments cause issues such as changes in work (Løvstad et al, 2020; Pelletier et al., 2020), social insecurity (Kristjansdottir et al., 2020), changes to social relationships (Kristjansdottir et al., 2020; Pelletier et al., 2020), fear of isolation and being stigmatized (Dunpath et al., 2015), decreased social well-being (Handford et al, 2017, Løvstad et al, 2020) and impacted general quality of life (Hsu et al., 2019). These results support the use of screening tools

and assessments aimed at assessing psychosocial and emotional aspects of pain as well as evaluating the social impacts of traumatic upper extremity injuries.

Psychological Factors

Psychological challenges that accompany upper extremity injuries include depression, PTSD, changes in self-perception, pain, fear and avoidance, anxiety, negative affect, and a person's ability to cope. Pain can be both physical and psychological. While the research clearly demonstrates the presence of co-morbid psychological factors with upper extremity injuries, there is a dearth of evidence supporting if or how therapy outcomes are impacted by *not* addressing these factors. Most studies relating to psychological factors and upper extremity injuries derived their outcome data from therapist or patient-rated outcome measures (PROM) administered pre- or post-rehabilitation, but they do not discuss specific treatment interventions. One study showed that patients who present at their initial office visit for traumatic hand and wrist conditions displaying worse pain coping strategies and decreased physical function will have more office visits (Berstein et al., 2019); however, they do not outline the treatment interventions used nor does this prove that the client did not have a successful recovery or outcome. More research is needed in this area to demonstrate if therapy outcomes are negatively affected by *not* addressing psychological factors of upper extremity injuries and conditions.

Social Factors

There is a considerable amount of evidence supporting how social factors

impact recovery from an upper extremity injury, especially those that are the result of trauma, including burn injuries (Gojowy et al., 2019, Grieve et al., 2020 and Li et al., 2017), orthopedic conditions or trauma (Chen et al., 2019, Cole, Underhill & Kennedy, 2016; Jayakumar et al., 2018, Jayakumar et al., 2020, Miedema et al., 2016, Pelletier et al., 2020, Silva & Sime, 2019; Wright et al. 2019), and cumulative trauma (King et al., 2021). Social factors include aspects such as available social support (King et al., 2021; Miedema et al., 2016; Mitchell et al., 2019), social communication and interactions (Cole, Underhill & Kennedy, 2016; Gojowy et al., 2019; Grieve et al., 2020), changes in roles and routines, and social barriers including access to transportation and socioeconomic status (Chen et al., 2019; Wright et al. 2019). For example, a client may not be able to drive due to their upper extremity injury and must rely on others for transportation thus impacting the person's roles and routines, social support, and access to the community.

Lack of social support from spouse, family and/or friends is the most frequently reported social factor affecting recovery (Esterhuizen, Naidoo & Govender, 2021; Jayakumar et al., 2018; King et al., 2021; Li et al., 2017; Pelletier et al., 2020; Silva & Sime, 2019). Two studies specifically discuss how a family's lack of knowledge and support directly impacts recovery (Cole, Underhill & Kennedy, 2016 and Li et al., 2017). Work or employment status is the second most discussed social factor. Several studies show that greater levels of disability are associated with individuals who experienced changes to work, were out of work,

unemployed, unemployed but able to work, unemployed and unable to work, retired, or involved in worker compensation or litigation claims (Gojowy et al., 2019, Jayakumar et al., 2018, Jayakumar et al., 2020; Miedema et al., 2016; Pelletier et al., 2020).

These results suggest that social support by, and interactions with, a spouse, family or friends most often impacts recovery from an upper extremity injury and that those with adequate social support tend to have lower levels of self-reported disability. Furthermore, by providing education to family members and friends regarding how to provide support to their loved one following a traumatic injury, such as a hand burn, they will be better equipped to play a role in the client's successful rehabilitation (Li et al., 2017). Factors related to returning to work and work status also impact recovery from an upper extremity injury. Since greater levels of disability were associated with those who did not return to their premorbid work status or were no longer able to work, it is important to foster a supportive work environment, including facilitating employer or co-worker social support, and adaptations to the environment and tasks as needed to meet patients at their current functional level.

Rehabilitation Factors

Rehabilitation factors that primarily affect a therapist's ability to address psychosocial factors when treating clients with upper extremity injuries include a heavy reliance on a biomechanical approach to therapy, therapist lack of knowledge, skills or resources, and difficulty prioritizing interventions. Thomas et al. (2021) discusses the additional factor of time constraints, however, therapists in this study were recent

graduates of an occupational therapy (OT) or physical therapy (PT) program and this may reflect other factors such as inexperience. Several studies suggest a strong reliance on biomechanical assessments and interventions such as strength testing, goniometry, edema, and sensation, measures of pain, and patient-reported discussion regarding their ability to perform functional tasks (Braun et al., 2017; Esterhuizen, Naidoo & Govender, 2021; Hand Therapy Certification Commission, 2021; Peters & Johnston, 2017; Peters et al., 2020). Esterhuizen, Naidoo and Govender (2021) found that interventions for the prevention and amelioration of wounds were more frequently provided than interventions facilitating participation in meaningful occupations. These findings suggest that due to the type of conditions treated in the hand setting, therapists may have to prioritize interventions based on medical acuity.

The data suggests that increasing therapist knowledge regarding psychosocial factors may improve a therapist's ability to address them. Additionally, these studies found a heavy reliance on the use of biomechanical screening and intervention tools which may hinder one’s ability to address psychosocial factors. This was found amongst a variety of providers who commonly treat upper extremity injuries including OTs, PTs, surgeons, exercise physiologists, and general practitioners, and points to a potential systemic problem across healthcare providers.

Summary and Implications for Program Design

Understanding hand and upper extremity injuries and conditions through a biopsychosocial lens enables practitioners to view and address a client’s needs holistically by acknowledging the significance of physical, social, and psychological

impacts on health. Physical factors, including wounds, changes to physical body appearance and pain impact social and psychological well-being. Over time this may lead to conditions such as depression, anxiety, and post-traumatic stress disorder. An individual may experience lack of social support from a spouse, friend or colleague, or changes to their work or employment status which can impact recovery. It is important for clinicians working with these clients to consider the social and psychological impacts alongside the physical body factors.

Research reveals, however, that therapists working with clients in upper extremity settings rely heavily on a biomechanical approach to assessment and intervention, have decreased knowledge regarding psychosocial factors and demonstrate difficulty prioritizing interventions. Thus, rehabilitation factors also contribute to client psychological and social factors being unaddressed in upper extremity settings. There are four overlapping elements consistent with a biopsychosocial approach including physical, psychological, social and rehabilitation practice factors that can affect a person's successful recovery from upper extremity injury or condition. Improving therapists' ability to assess and address psychological and social factors will lead to improved client outcomes.

CHAPTER THREE – Overview of Current Approaches and Methods

Chapter 3: Introduction

Psychosocial factors can directly influence a person's successful recovery from an upper limb injury as much as the physical factors including one's ability to return to engagement in valued, expected, or needed occupations such as work, leisure, self-care, and play. There is a considerable amount of evidence that demonstrates the negative impact of pain on an individual's psychological and social well-being, most often correlating with depression, symptoms of posttraumatic stress disorder (PTSD) and anxiety. There is also a considerable amount of evidence that demonstrates how social factors such as a client's social supports, social communications and interactions, roles and routines, and social barriers (socioeconomic status, environment, access to transportation) impact recovery from an upper extremity injury. A body of evidence points to therapists' limited use of psychosocial assessments and interventions within the hand therapy context as compared to biomechanical approaches as well as clinical environmental factors which affect a therapist's ability to address psychosocial factors when treating a client with an upper extremity injury. Although more research is needed in this area, evidence suggests that a combination of these factors can influence a person's successful recovery and overall health and well-being.

Summary of the Evidence Base

The author completed a search of the literature primarily using the CINAHL, APA PsycINFO and EBSCOhost databases. Additional search engines included Google Scholar, the American Journal of Occupational Therapy, and The Journal of Hand

Therapy. Limits were set for the English language and with a date range between 2016 to 2022; a few studies from 2014 and 2015 were included. Search terms related to the following five criterion questions and rendered 47 articles included in this review: 1) What pain management interventions exist for individuals with an upper extremity injury or impairment and what is the evidence of their effectiveness? 2) What psychological interventions exist for individuals with an upper extremity injury or impairment who experience symptoms of PTSD and/or depression and/or anxiety and what is the evidence of their effectiveness? 3) What social supports or resources are available for individuals with an upper extremity injury or impairment and what is the evidence of their effectiveness? 4) Is there evidence regarding aspects of the clinical environment (i.e., physical space or setup, scheduling, access to equipment, session duration, individual vs. group therapy, etc.) that contribute to more positive outcomes for individuals with an upper extremity or impairment? 5) Is there evidence regarding the treating therapist's or care provider's level of education or knowledge regarding upper extremity injury rehabilitation or management that is more associated with positive outcomes? Exclusion criteria included: 1) publication date more than 8 years from the present, and 2) lack of relevance to the question. Furthermore, the author categorized the articles based on discipline (physical therapy (PT), occupational therapy (OT), or other professions) and noted if an intervention was more effective and for whom. Overall, most of the evidence was derived from the PT literature.

Pain Management Interventions

Exercise

Exercise was the most frequently reported intervention to effectively address upper extremity pain. Studies examine the use of exercise to manage a variety of conditions including subacromial shoulder pain (Berg et al., 2021; Pieters et al., 2020), frozen shoulder (Mertens et al., 2022), hemiplegic shoulder pain (Kumar et al., 2021), musculoskeletal-related upper extremity conditions (Marik & Roll, 2017; Menta et al., 2015) and triangular fibrocartilage complex (TFCC) injuries (Bonhof-Jansen et al., 2019; Chen, 2021). Exercise interventions included a variety of specific techniques including high intensity interval training (Berg et al., 2021), sensorimotor exercises (Chen, 2021), positioning, postural re-education, range of motion exercises, stretching, and strengthening (Kumar et al., 2021) as well as non-descript exercise therapy (Pieters et al., 2020; Bonhof-Jansen et al., 2019, Mertens et al., 2022, Marik & Roll, 2017; Menta et al., 2015). While exercise therapy appears to be effective in reducing pain, one should consider this intervention in light of its limitations. Due to the nature of rehabilitation, some of the studies included interventions performed simultaneously or in conjunction with exercise thus making it challenging to state that exercise alone provided the pain reduction benefit. Furthermore, in general, the quality of evidence in these studies was generally low (Bonhof-Jansen et al., 2019), they did not include a control group (Chen, 2021), or they used small sample sizes (Berg et al., 2021; Bonhof-Jansen et al., 2019; Kumar et al., 2021; Li et al., 2022). None of the studies reported consistency or standardization of exercises (dosing, type, frequency, etc.) which makes it difficult to

replicate the results. Overall, the evidence overall does support exercise as an effective intervention to reduce upper extremity pain.

Cognitive and Behavioral Approaches

Evidence supports the use of a variety of cognitive and behavioral approaches for reducing upper extremity pain, specifically shoulder pain. Cognitive approaches reduced emotional aspects of pain and included techniques such as emotional freedom (Farzad et al., 2021), pain coping strategies (Dragesund, Nilsen & Kvåle, 2021; Farzad et al., 2021), physical-cognitive-mindfulness training (Farzad et al., 2021), psychological flexibility (Farzad et al., 2021), face-to-face cognitive-behavioral treatment (CBT) (Farzad et al., 2021), and cognitive therapy using virtual reality (Farzad et al., 2021). Matamala-Gomez et al. (2019) found virtual reality particularly viable for reducing chronic arm pain.

Behavioral approaches reduced pain catastrophizing and kinesiophobia or fear of physical movement. Techniques included the use of behavioral therapy (Farzad et al., 2021), Graded Exercise Therapy (Farzad et al., 2021), and movement representation techniques. Movement representation techniques include mirror therapy and graded motor imagery, which were particularly effective for pain from Complex Regional Pain Syndrome (CRPS), acute pain and trauma, and post stroke (Thieme et al., 2016). Overall, no intervention was deemed most effective for reducing pain and largely depended on the etiology of the pain (Farzad et al., 2021; Matamala-Gomez et al., 2019; Thieme et al., 2016).

Manual Therapy

Evidence supports the use of kinesiotape and manual therapy for shoulder pain due to shoulder conditions such as rotator cuff pathology and hemiplegia (Desjardins-Charbonneau et al., 2015; Li et al., 2022; Marik & Roll, 2017). Desjardins-Charbonneau et al. (2015) found low to moderate evidence that manual therapy either alone or in conjunction with other modalities may be effective in reducing pain. These studies are limited by the fact that these interventions were most often completed in conjunction with other interventions, and they do not outline any consistency with dosing, parameters, frequency, or duration making it difficult to generalize these results.

Multimodal Approaches

Several studies suggest the use of multimodal approaches for reducing pain related to conditions such as carpometacarpal (CMC) joint arthritis (Aebischer, Elsig, & Taeymans, 2016), lateral epicondylitis (Girgis & Duarte, 2020; Yao et al. 2020), pain associated with breast cancer-related lymphedema (Rangon et al., 2022) and shoulder conditions (Marik & Roll, 2017), including adhesive capsulitis (Nakandala et al., 2021). Marik & Roll (2017) report strong to moderate evidence for the use of intervention combinations including physical agent modalities, exercises, and manual therapies. Aebischer, Elsig, & Taeymans (2016) reported that single interventions were not as effective for treating pain related to CMC joint arthritis. The evidence is limited relating to dosing and which combination of interventions work best; these variables also differ depending on the etiology of pain.

Psychological Interventions

Cognitive Behavioral Therapy (CBT)

Cognitive Behavioral Therapy (CBT) is the most frequently reported intervention used for individuals with an upper extremity injury or impairment who experience symptoms of post-traumatic stress disorder (PTSD), depression and/or anxiety (D'Egidio et al., 2017; Babatunde et al., 2020; Szeverenyi et al., 2018; Tong et al, 2020). CBT is most often reported as effective for patients undergoing treatment for breast cancer (D'Egidio et al., 2017), orthopedic surgery (Szeverenyi et al., 2018; Tong et al, 2020), and hand therapy (Babatunde et al., 2020).

Other Psychological Therapies

Other interventions strongly supported in the literature include the use of psychoeducation (D'Egidio et al., 2017), emotional counseling to target maladaptive beliefs regarding recovery and self-efficacy (De Baets et al., 2019; Tong et al, 2020), patient education (Renouf, Leary & Wiseman, 2014; Szeverenyi et al., 2018) and relaxation techniques (Szeverenyi et al., 2018; Tong et al, 2020). Disciplines including PT, OT, nursing, and physical medicine support the use of a multidisciplinary and multimodal approach to pain management. In general, the most anxiety producing procedures were operative, suggesting that psychological interventions should be included with pre- and post-operative care.

Social Supports and Resources

In general, findings show that social support networks have an impact on outcomes for individuals recovering from upper extremity conditions including health

and well-being (Chan, Yang & Lauricella, 2020; Davis, Crittenden & Cohen, 2021; Di Tella et al., 2018), reduced pain perception and stress (Che et al., 2018), improved emotional support influencing high-stakes treatment decisions (Riffin et al., 2016), altered self-regulation during strenuous physical activity (Davis, Crittenden & Cohen, 2021) and coping strategies (Mikal et al., 2020; Coan et al., 2017; Di Tella et al., 2018). Examples of beneficial approaches included hand holding from a familiar person (Che et al., 2018; Coan et al., 2017), seeking social network members who had similar first-hand experiences (Riffin et al., 2016), and virtual social networks (Mikal et al., 2020). Limitations of these findings include small sample size (Che et al., 2018) and lack of specificity to upper extremity conditions (Mikal et al., 2020).

Impact of the Clinical Environment

A body of literature examined the impact of the clinical environment on patient outcomes. Limitations of these studies included small sample size (Skubik-Peplaski, Howell & Hunter, 2016; Weisfeld et al., 2021), limited variation in geographical region (Zadeh et al., 2018), were derived from the inpatient setting (Skubik-Peplaski, Howell & Hunter, 2016), were derived from other areas of the healthcare such as dentistry (Weisfeld et al., 2021) or are still out for peer review (Rossettini et al., 2020). However, some of the concepts can be generalized and transferred to an outpatient population and is of moderate to high quality evidence (Bayramzadeh, Ahmadpour, & Aghaei, 2021). The following subsections describe the most frequently cited themes within the clinical environment that impact care.

Room Organization and Design

Several studies examined the effect of room organization, layout, size and design on patient outcomes and perceived quality of care. Room design interventions can provide positive distractions and psychosocial support for patients, family, and staff, by providing pleasant views of outside areas, soothing colors, or artwork, and by creating flow through carefully selected and placed furniture (Iyendo, Uwajeh & Ikenna, 2016; Water et al., 2017; Colley & Zeeman, 2020; Stans et al., 2017; Weisfeld et al., 2021). Appropriately sized furniture is also important to meet client needs (Water et al., 2017). For example, providing tall chairs for clients recovering from hip procedures or a small desk and chair for a pediatric client creates a welcoming environment for these populations.

Wall art is also important to consider (Xuan et al., 2021). Size of the wall art matters in that it should fill the available space; the larger the size, the more positive the impact (Devlin et al., 2020; Water et al., 2017). Also, people tend to prefer images of nature or views of nature (Weisfeld et al., 2021). There needs to be a balance in the design to allow for comfort and to provide a welcoming environment, such as by providing additional seating for family members (Eady & Moreau, 2018). The size of the treatment and waiting areas also matter (Bayramzadeh, Ahmadpour, & Aghaei, 2021; Xuan et al., 2021). A well-designed, organized, physical environment can increase efficiency and effectiveness in providing care, which benefits both the patient and provider and improves overall satisfaction (Piazza et al., 2017; Skubik-Peplaski, Howell & Hunter, 2016).

Noise/sounds

When applied strategically, sensory stimuli such as noise and sounds can affect patient satisfaction and care (Bayramzadeh, Ahmadpour, & Aghaei, 2021). Patients tend to prefer quiet environments (Stans et al., 2017), however soothing sounds can also serve as a positive distraction (Iyendo, Uwajeh & Ikenna, 2016). Nature sounds, for example, may help with reducing anxiety for individuals undergoing dental or medical procedures (Weisfeld et al., 2021). Xuan et al. (2021) found that participants' experience related to the acoustic environment also had a significant relationship with their perceived waiting time, which differed from their actual waiting time, and thus has implications for the perceived quality of care. Finally, an optimal level of social interactions impacted the flow of the clinic and patient-perceived quality of care (Bazley et al., 2016).

Temperature

Temperature influences patient and provider comfort or discomfort. Several articles report temperature as a significant factor affecting one's healthcare experience; however, these studies do not describe recommendations for an ideal temperature (Bayramzadeh, Ahmadpour, & Aghaei, 2021; Bazley et al., 2016; Rossettini et al., 2020; Stans et al., 2017) other than "ambient" (Zadeh et al., 2018, p. 250). More research is needed in this area to determine a specific ideal temperature.

Signage

Signage is important both within and for accessing the physical environment and use of health services. Water et al. (2017) points out how elements such as where to park and wayfinding within a healthcare facility contribute to client stress. Xuan et al. (2021)

notes that the signage system, among other factors, is a significant predictor for overall satisfaction and clinics should consider ways to help clients and their families feel more welcome. They outline strategies such as posting signage that invites families into spaces or by creating a visible sign-in/sign-out board for families (Eady & Moreau, 2018). This is especially significant for communication between people who are communication vulnerable and their healthcare professionals (Stans et al., 2017). They indicate that healthcare professionals need to be aware of the potential influence of environmental elements, such as written information, on communication.

Access to Privacy

Access to single and private rooms is an important factor for clients, particularly women who struggle with body image issues, such as social physique anxiety (Driediger, McKay & Hall, 2017). Rossettini et al. (2020) and Morera-Balaguer et al. (2018) point out that providing single or private rooms is essential not only for clothing changes but also for being able to express oneself privately without being exposed to the public.

Therapist Communication Style

Stans et al. (2017) examined factors in the physical environment that play a role in conversations, including written information and availability of augmentative and alternative communication (AAC) tools. These factors highlighted barriers and potential strategies for improving the quality of patient provider conversations and patient accessibility to services. Other characteristics of the clinical environment that impact communication include organization and team coordination (Morera-Balaguer et al., 2018). Furthermore, Rossettini et al. (2020) found that patients valued tailored

communication that addressed specific, individual needs and that provided emotional support. This suggests that effective communication requires adequate time spent with the patient and interpersonal communication skills such as using active listening, collaborating with the patient regarding their care, and being respectful of the patient's point of view (Rossettini et al., 2020).

Lighting/View of Nature

Proper application of sensory stimuli can enhance psychological and physiological outcomes for clients and staff (Bayramzadeh, Ahmadpour, & Aghaei, 2021; Weisfeld et al., 2021). Natural light is recommended over artificial light, however increased lighting in general can serve as a reasonable alternative (Xuan et al., 2021; Zadeh et al., 2018). Availability to nature views via windows, walls or doors provide positive distractions for patients compared to views of other people or walls, which in turn can reduce stress and fatigue (Bazley et al., 2016; Iyendo, Uwajeh & Ikenna, 2016; Xuan et al., 2021). Other visual stimuli such as live plants or posters of plants also serve to reduce anxiety, for example, for individuals undergoing a medical procedure (Weisfeld et al., 2021).

Access to the Clinic, Appointments and Desired Therapist

Patients appreciate a service organization that is conveniently located, easy to find, and accessible for individuals who are injured or disabled (Rossettini et al., 2020; Water et al., 2017; Piazza et al., 2017). This includes access to flexible payment plans, coordination and precision in data management, and the access and ease of booking appointments (Rossettini et al., 2020; Piazza et al., 2017). Patients also value continuity

of treatment performed by the same therapist and over a period of time long enough to develop trust (Morera-Balaguer et al., 2018; Rossettini et al., 2020).

Access to Occupation-based Environments

Skubik-Peplaski, Howell & Hunter (2016) and Zadeh et al. (2018) highlight the importance of adapting the physical environment to match the nature of the work. Skubik-Peplaski, Howell & Hunter (2016) suggest a potential relationship between the physical environment and the interventions chosen by the occupational therapist noting that in a standard therapy gym, therapists most often used preparatory methods. These findings have implications for outpatient rehabilitation clinics and suggest that home-like and supportive environments are more likely to facilitate participation in the occupation-based treatments that are essential for practicing skills required to transition to home management successfully.

Therapist Education

Morera-Balaguer et al. (2018) found that patients perceived that the age of their therapist correlated with their level of experience. Rossettini et al. (2020) reports that clients favor receiving care from a therapist with a higher level of expertise or from who they perceive to be more competent. This suggests that patients with upper extremity conditions may perceive better care or prefer care provided by occupational or physical therapists who are also certified in hand therapy. Hand therapy certification "involves meeting rigorous standards, developing a long-range career path, and acquiring the advanced study and training required to pass the certification examination and earn the CHT [certified hand therapist] credential" (HTCC, 2021, p.1). However, it is criticized

for focusing primarily on patient body functions and activities of daily living (ADLs), with limited attention paid to participation and the environment (Lesher et al., 2017). The certification exam test blueprint de-emphasizes the psychological and social impacts of upper extremity injuries and has a strong focus on knowledge related to the basic science, assessment, and intervention of the upper limb (HTCC, 2021).

Keller et al. (2022) conducted a practice analysis survey in 2019 that shows that CHTs are increasing use of psychological supports, such as relaxation techniques, and more therapists are seeking higher education as compared to previous years, which may address this problem. Lesher et al. (2017) further suggest that OTs specializing in upper extremity rehabilitation should use outcome measures that embody more comprehensive frameworks for classifying function and activity such as the International Classification of Functioning (World Health Organization, 2013) and the Occupational Therapy Practice Framework (American Occupational Therapy Association, 2020).

Summary and Implications for Program Design

Psychosocial factors can influence a person's successful recovery from an upper limb injury as much as the physical factors; however, psychological, and social factors may be overlooked and under addressed by the treating therapist which can impact outcomes. Factors or barriers contributing to this problem include but are not limited to aspects of the clinical environment, aspects of the clinical system or organization (i.e., scheduling, time constraints etc.), therapist lack of knowledge regarding psychosocial factors, therapist lack of use or implementation of psychosocial assessments or interventions, overreliance on biomedical or biomechanical assessments and

interventions, and feasibility concerns regarding provision of these services. The author's proposed program is development of a proactive continuing education (CEU) course using a web-based learning management system (LMS) aimed at increasing knowledge regarding psychosocial assessments and interventions that can feasibly be incorporated into hand therapy practice.

The evidence regarding interventions to maximize successful outcomes for patients with upper extremity conditions points to a multimodal approach. Regarding pain management strategies, clinicians need to establish the etiology of pain to determine the best approach. Research mainly supports exercise, cognitive and behavioral approaches, manual therapy, and multimodal approaches. Psychological interventions for individuals with an upper extremity injury or impairment who experience symptoms of PTSD, depression, or anxiety point to the use of cognitive behavioral therapy and other psychological therapies, such as relaxation, with best results using a multimodal approach. Social support has a significant influence on positive patient outcomes and the evidence suggests that access to a familiar significant other, hand holding and discussions with people who have experienced similar challenges are most impactful.

There are many aspects of the clinical environment that can enhance social support, patient satisfaction, and health outcomes. They include well-designed rooms, noise control, ensuring ambient room temperature, clear signage, access to private treatment spaces, effective coordination and communication of the care team, proper lighting, access to nature views, preferred therapist and appointment, and access to treatment spaces designed for engagement in occupations. These concepts support a

biopsychosocial approach to providing optimal patient care. Finally, evidence suggests that clients tend to prefer and perceive therapists who are older, have higher education, or who hold specialty certifications as more competent compared to general practitioners.

CHAPTER FOUR – Description of the Proposed Program

Basis of the Proposed Program

Unlocking Biopsychosocial Hand Therapy is a continuing education (CEU) course aimed at increasing therapist knowledge regarding psychosocial assessments and interventions that can feasibly be incorporated into upper extremity practice. The proposed program supports the value and role of occupational therapy practitioners in providing mental and behavioral health services for clients receiving services for upper extremity injuries or condition. A body of evidence points to therapists' limited use of psychosocial assessments and interventions within the hand therapy context as compared to biomechanical approaches, which may hinder a client's progress toward recovery (Chown et al., 2018; Kurrus et al., 2022; Van der Velde et al., 2016). The purpose of the course is to improve patient outcomes by looking beyond only physically related upper extremity performance deficits. Currently, no program or professional development activity exists that focuses on assessment and management of psychosocial factors specifically for therapists working in outpatient, upper extremity settings. *Unlocking Biopsychosocial Hand Therapy* aims to address this need and will be developed using existing evidence that supports psychological, social, and physical approaches to managing performance deficits due to upper extremity conditions: a biopsychosocial approach to care.

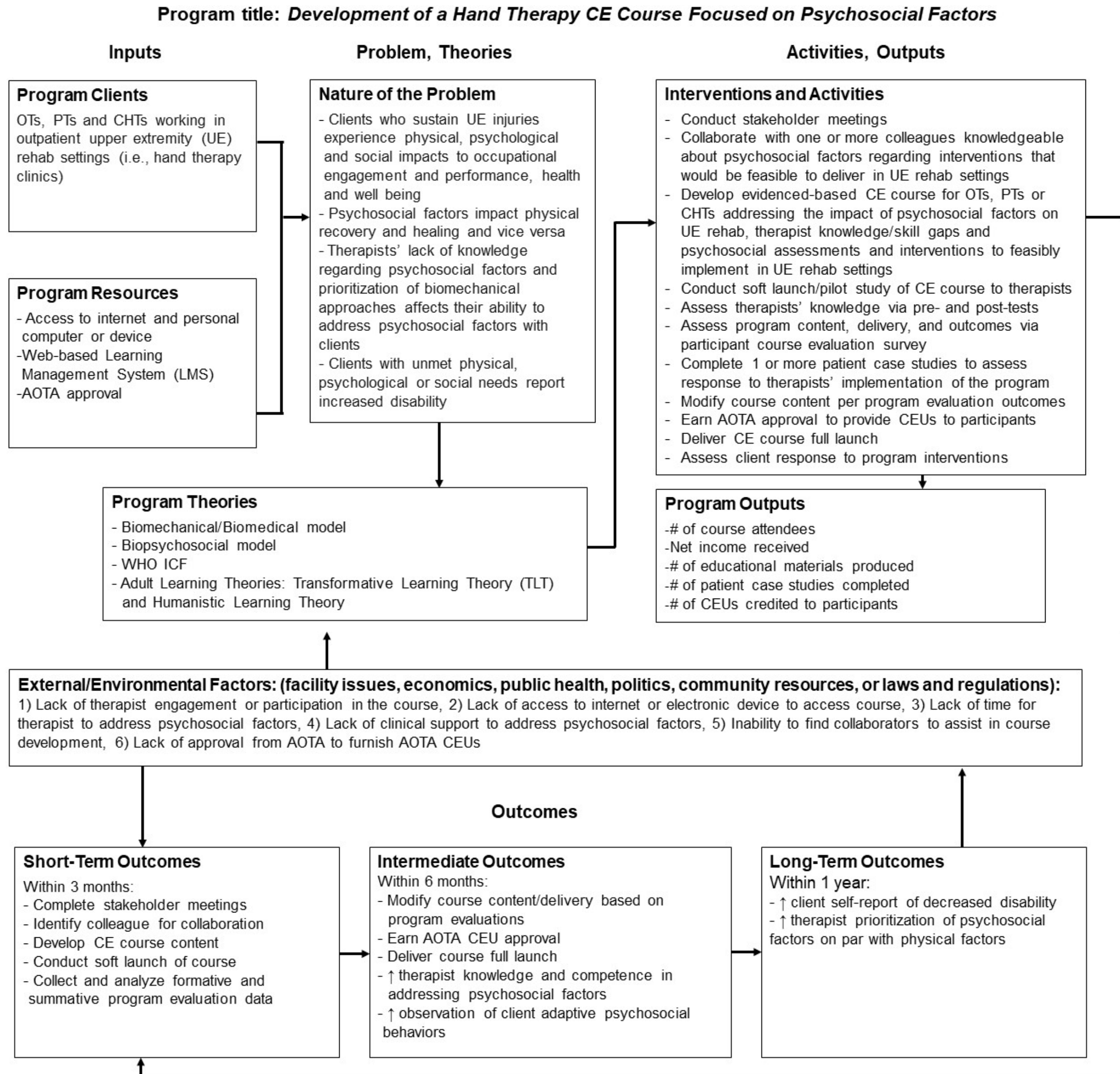
Previous approaches to address factors such as pain, PTSD, anxiety, depression, and social support include a variety of methods. Research regarding upper extremity pain management techniques mainly supports the use of exercise, cognitive and behavioral

approaches, manual therapy, and multimodal approaches. Interventions for individuals who experience symptoms of PTSD, depression, or anxiety point to the use of cognitive behavioral therapy. Social support such as access to a familiar significant other, hand holding and discussions with people who have experienced similar challenges positively impact patient outcomes. Aspects of the clinical environment, such as access to privacy, therapist communication style and access to occupation-based treatment spaces, also affect a therapist's ability to address psychosocial factors when treating a client with an upper extremity injury.

Utilizing this body of evidence, *Unlocking Biopsychosocial Hand Therapy* will deliver training via two online course components lasting a total of six hours. Participants will complete a pre- and post-test to demonstrate acquisition of learning objectives. Participants will also be asked to complete an evaluation survey regarding course delivery to inform future iterations of the course. Intermediate and long-term outcomes of this course are to increase therapist knowledge and competence regarding psychosocial assessments and interventions, to increase therapist prioritization of addressing psychosocial factors, and to increase client self-report of decreased disability. Details regarding the proposed program are provided in Figure 4.1 below.

Figure 4.1

Full Logic Model of the Proposed Program and Evaluation



Stakeholders

Unlocking Biopsychosocial Hand Therapy aims to support the overall health and wellbeing of clients seeking services in an outpatient, upper extremity practice setting. Additional stakeholders include therapists, referring providers, and state or national organizations. Therapists will gain knowledge to help them better identify and address psychosocial factors impacting client outcomes. Referring providers will benefit from having improved client outcomes. Other stakeholders including the American Society of Hand Therapists (ASHT), the American Occupational Therapy Association (AOTA), and individual state occupational therapy associations may want to provide this educational program for their membership.

Program Participants and Resources

Intended Program Participants

The intended program participants are occupational therapy practitioners, physical therapy, or Certified Hand Therapy (CHT) practitioners with at least one year of experience treating upper extremity injuries or conditions in an outpatient rehabilitation setting. The author will recruit these participants from a variety of venues, but most easily via email notifications advertising the program. The author owns and operates Right Hand Therapy, LLC, which provides services and products related to the practice of hand therapy and will host the program. The author will use the currently available contact lists which include occupational therapy practitioners and physical therapy practitioners. Since Right Hand Therapy, LLC is an AOTA Approved Provider Program participant, the author has access to free advertising of approved continuing education events via the

AOTA website. The author will also commission paid advertisements through the American Society of Hand Therapists (ASHT) website.

Personnel

The program will be presented by the author, Lisa Owen, OTR/L, CLT, CHT, and yet to be determined co-presenters. The author will serve as a content expert in integrating social, mental, and behavioral health interventions into an upper extremity clinical setting. Ideally, the other presenters would also be occupational therapy practitioners with experience in outpatient therapy and working with clients with mental or behavioral health disorders; however, other professionals will be considered. The method for recruiting additional personnel would primarily involve leveraging the author's social network or networking via social media platforms such as Facebook or LinkedIn. Training would occur via one-to-one meetings to allow for collaboration regarding course content and delivery methods.

Outreach Plan

To maximize participation, the author will market the course on high traffic websites including ASHT, AOTA, and the Hand Therapy Certification Commission (HTCC) as outlined in Chapter 6 – Dissemination Plan. AOTA's Approved Providers can advertise their course for free and HTCC also permits free advertising of courses. A three-month advertisement on the homepage of the ASHT website has the potential to reach over 3,700 therapists (ASHT, 2022).

Additionally, the author will engage participants in email campaigns delivered through Right Hand Therapy, LLC. The author will respond to email inquiries and phone

calls quickly to maximize participant engagement. If participants want to meet in person, the author will arrange a virtual meeting. This is the sort of hands-on customer service that is a hallmark of Right Hand Therapy, LLC and has worked very well for previous programs. It is important to understand the learning needs of each participant and their motivation for consuming the educational program. The author will ask questions such as "why are you interested in taking this course?" or "is there a particularly challenging patient case that you would like to discuss" to draw awareness to psychosocial issues within their patient population and gain increased attention to this program to promote participant "buy-in".

Program Practice Scenario Outlining Utilization of the Course

The following scenario highlights utilization of this course. A client is referred to an occupational therapy practitioner, who specializes in upper extremity rehabilitation, for left-hand stiffness and contractures three months following emergency fasciotomy to treat compartment syndrome. The client developed compartment syndrome after injecting himself intravenously with illicit drugs and did not wear the recommended orthosis furnished in the hospital to minimize the risk of contractures. The treating occupational therapy practitioner experiences decreased confidence in how to address behavioral health issues in the hand therapy setting but recognizes that this will be essential to maximize client participation and compliance with the plan of care. The occupational therapy practitioner decides to register for the *Unlocking Biopsychosocial Hand Therapy* course. Following participation in the course, the occupational therapy practitioner demonstrates increased knowledge, awareness, and confidence regarding the

psychosocial factors affecting the newly referred client. The occupational therapy practitioner is now able to confidently and competently use assessment and intervention techniques to address the psychosocial aspects of this case in addition to addressing the client's physical impairments. As a result, the client participates in OT services per the mutually established plan of care and reports decreased disability upon discharge.

Interventions and Activities

Program Content

Using the biopsychosocial model as a guide, the *Unlocking Biopsychosocial Hand Therapy* course will fill therapist knowledge gaps regarding psychosocial and rehabilitation practice factors in a supportive, online learning environment. The course will be delivered in two components.

Self-Directed Course Component

Participants will first engage in a self-directed, two-hour, online component to learn about psychosocial factors and evidenced-informed psychosocial assessment tools feasible for use in upper extremity practice using the web-based learning management system (LMS) DigitalChalk (https://www.digitalchalk.com/). Learners will gain access to the module via logging into their account (access provided following registration) and they will move through the programmed instruction of learning resources and activities at their own pace using any electronic device with access to high-speed Internet (for example mobile devices such as laptops, smartphones, tablets, or other handheld devices).

The self-directed course component is based in the Humanistic Learning Theory

which assumes that one's motivation is derived from their needs, feelings, desire to learn, desire for positive self-growth, and confirmation of self-concept (Braungart, Braungart & Gamut, 2011). By offering self-directed, self-paced modules, learners are provided with a safe learning space that they can access from the comfort of their homes, work, or on-the-go (Milheim, 2012). Table 4.1 outlines the proposed course schedule and Table 4.2 provides a detailed sample teaching plan of two of the course modules.

Table 4.1

Proposed Self-Directed Course Schedule

Topic	Content	Duration
Introduction	• lecture/self-guided instruction	5 minutes
Overview of course content and expectations	• lecture/self-guided instruction	2 minutes
Pre-test/Learner assessment	• quiz	10 minutes
Module 1: Overview of psychological factors (see Table 4.2 for a sample of the proposed teaching plan)	• lecture/self-guided instruction • Conditions to be discussed include pain, anxiety, post-traumatic stress disorder (PTSD), depression, shock, hopelessness, reliving the trauma, fear avoidance, and substance use disorder	20 minutes
Module 2: Psychological assessment tools for the upper extremity therapist (see Table 4.2 for a sample of the proposed teaching plan)	• lecture/self-guided instruction • Examples of assessment tools to be discussed include the State-Trait Anxiety Inventory (STAI), Hospital Anxiety and Depression Scale (HADS), and Patient-Reported Outcomes Measurement Information System (PROMIS) Affect Measures (depression, anxiety, and anger)	20 minutes

Reflective journal response	• open ended self-assessment	8 minutes
Module 3: Overview of social and environmental factors	• lecture/self-guided instruction • Concepts to be discussed include the clinical environment, presence, or absence of social supports (i.e., from spouse, family and/or friends), social communications and interactions, roles and routines, and social barriers (socioeconomic status, environment, access to transportation)	20 minutes
Module 4: Social assessment tools for the upper extremity therapist	• lecture/self-guided instruction • Examples of topics to be discussed include patient insurance status, substance use habits, barriers/ facilitators for return to work, and the Social Support Questionnaire (SSQ)	20 minutes
Post-test	• quiz	10 minutes
Learner needs assessment	• survey	5 minutes
	Total	**2 hours**

Table 4.2

Sample of the Proposed Teaching Plan for Modules 1 and 2

Modules 1 and 2: Psychological Assessment		
Overall learning goal: The goal of these modules is to educate learners in available evaluation techniques to assess psychological factors that may accompany upper extremity injuries in the outpatient rehabilitation setting.		
Specific learning objective	**Learning activities and supporting learning theories**	**Instructional materials and evaluation methods**
1. Following completion of the online module section regarding assessment, the learner will select three psychological conditions commonly experienced by clients with upper extremity injuries or conditions.	This 20-minute, self-directed learning activity targets *knowledge level* learning within the **cognitive domain**. An outline of the content includes: -Introduction to the impact of upper extremity injuries or conditions on mental health. -Review of common psychological conditions, their definitions and risk factors (anxiety, post-traumatic stress disorder (PTSD), depression, etc). -Review of current literature discussing specific upper extremity injuries/conditions and associated psychological impacts. **Learning theory**: humanistic	Computer-assisted instruction (CAI) including audiovisual materials such as PowerPoint slides with narration, written materials and videos **Evaluation Methods**: Pre-and post-test and periodic quizzes
2. Following completion of the online module section regarding assessment, the learner will be able to choose three evaluation tools that	This 20-minute, self-directed learning activity targets *knowledge level* learning within the **cognitive domain**. An outline of the content includes: -Introduction to available psychological assessment tools	Computer-assisted instruction (CAI) including audiovisual materials such as PowerPoint slides with narration, written materials, and videos

screen for psychological conditions when treating a client with an upper extremity injury or condition.	that could be used in an outpatient upper extremity clinic, including time and materials required to administer. -Review of psychometric properties of available assessment tools. **Learning theory**: humanistic	**Evaluation Methods**: Pre-and post-test and periodic quizzes
3. After attending all learning activities as part of the online module section regarding assessment, the learner will be able to express in a journal entry their feelings of increased confidence when selecting psychological assessments for use with their clients.	This 5-minute learning activity is a reflective journal entry completed electronically to target a *responding level* of **affective** response. The prompt for the journal entry is: -Reflecting on the information presented throughout this module, how comfortable do you feel selecting assessments to evaluate the psychological impacts of upper extremity conditions or injuries when working with your clients? **Learning theory**: humanistic	Computer-assisted instruction (CAI) including a visual text prompt followed by a blank form within which learners can submit a written response. **Evaluation Methods**: Pre-test, Self-reflection/self- assessment

Interactive Course Component

Once participants complete the self-directed component, they will be eligible to participate in the four-hour, live, virtual course component comprised of lectures and small group discussions using the video conferencing platform, Zoom. The lectures will include education and training regarding evidence-based psychosocial interventions provided in a supportive environment consistent with the humanistic learning theory. Small group discussions will include the use of case scenarios and are based on the

Transformative Learning Theory. The key elements of Transformative Learning Theory include expanding existing points of view, learning, and establishing new points of view via a disorienting dilemma i.e., a case scenario, transforming points of view, and critical self-reflection (Mezirow, 1997). The purpose of these discussions is to stimulate dialogue and to expose clinicians to various perspectives regarding how to address a client's psychosocial needs following an upper extremity injury. The course will provide a safe space to reflect on current practice trends and transform the point of view that therapists do not have the time, knowledge, or resources to meaningfully address psychological factors in upper extremity practice settings. Table 4.3 outlines the proposed interactive course content and Table 4.4 provides a sample of a detailed teaching plan.

Table 4.3

Proposed Interactive Course Schedule

Topic	Content	Duration
Introduction	• lecture	10 minutes
Review of content from online component	• interactive discussion • Topics to be discussed include psychosocial factors and perceived barriers/supports to psychosocial assessment or intervention	20 minutes
Interventions to address psychological factors	• lecture • Topics to be discussed include an overview of pain management interventions: exercise, cognitive and behavioral approaches, manual therapy, and multimodal approaches • Training in psychological interventions: Cognitive Behavioral Therapy (CBT),	30 minutes

	counseling regarding recovery and self-efficacy, patient education, and relaxation/mindfulness training	
Discussion of case studies	• group work (breakout rooms), interactive discussions	60 minutes
Interventions to address social and environmental factors	• lecture • Topics to be discussed include social support, hand holding with a familiar person, seeking social network members with a first-hand experience, and virtual social networks • Training to be provided in clinical environment design: room organization and design, noises/sounds, temperature, signage, access to privacy, therapist communication style, lighting/view of nature, access to clinic, appointments and desired therapist, and access to occupation-based environments	30 minutes
Discussion of case studies	• group work (breakout rooms), interactive discussions	60 minutes
Wrap up/questions and answers	• lecture/interactive discussions	15 minutes
Post-test	• quiz	10 minutes
Post course evaluation	• survey	5 minutes
	Total	**4 hours**

Table 4.4

Sample Teaching Plan for the Interactive Course Component

Online Live Course Schedule		
Overall learning goal: The goal of this live course component is to educate learners in available intervention techniques to address psychological and social factors that may accompany upper extremity injuries in the outpatient rehabilitation setting.		
Specific learning objective	**Learning activities and supporting learning theories**	**Instructional materials and evaluation methods**
1. Following completion of the live course section regarding interventions to address psychological factors, the learner will be able to select at least one strategy to address a psychological concern when treating a client with an upper extremity injury or condition.	This 30-minute activity includes lecture and group discussions to target *knowledge level* learning within the **cognitive domain**. An outline of the content includes: -Introduction to evidenced-based psychological intervention strategies and tools that could be utilized in an outpatient upper extremity clinic, including time and materials required to implement (presented by instructor). -Interactive discussion regarding barriers and support for these interventions (instructor facilitates group discussion). **Learning theory**: humanistic	Computer-assisted instruction (CAI) including audiovisual materials such as PowerPoint slides with narration, written materials and videos **Evaluation Methods**: Pre-and post-test
2. Following completion of the live course section regarding interventions to address psychological factors, the learner	This 60-minute activity includes group teaching, case studies, role play and simulations to target *characterization level* learning within the **affective domain**. An outline of the content includes:	Computer-assisted instruction (CAI) including audiovisual materials such as PowerPoint slides with the case study displayed

will demonstrate proper use of at least one strategy to address a psychological factor of a client during a simulated patient session.	-Introduction of a case study presenting the impact of an upper extremity injury/condition on an individual's mental health -Division of the larger group into smaller groups of 2 to 3 participants to discuss intervention options for the patient case -Simulation involving each small group enacting one proposed intervention strategy to address the psychological concerns presented in the case study -Whole group discussion to synthesize all participants' experiences and reflect on various perspectives **Learning theory:** transformative	**Evaluation Methods**: return demonstration

Program Outputs and Outcomes

Although the exact number of participants may vary, ideally the course would have 40 participants, who would participate in a single instance of the course, and the course would provide six CEUs (0.6 AOTA CEUs) to each participant. The author will develop all course content and distribute it electronically via DigitalChalk and Zoom. Participants may view materials electronically or download and print them as needed. Educational materials will include but are not limited to PowerPoint presentations, handouts, access to free source evaluation and intervention tools, and a resource list of links for any copyrighted materials that cannot be shared or distributed with open access.

Participants will have access to the online materials for one year.

Outcomes

After conducting stakeholder meetings and collaborating with colleagues regarding course content, the author will develop the *Unlocking Biopsychosocial Hand Therapy* course. Within three months, the author will conduct a soft launch to provide valuable feedback regarding course outcomes as measured by participants earning 80% or higher on the course post-test to demonstrate increased acquisition of knowledge and confidence. Within six months, the author aims to collect patient case studies to assess therapists' implementation of the program and inform any needed changes to course content or delivery. Ideally, clients of therapist participants in the program will demonstrate increased adaptive behaviors in response to their upper extremity injury or condition. In one year, the author aims to see increased client self-report of decreased disability, increased therapist prioritization of psychosocial factors in upper extremity practice and increased discussion surrounding the value of addressing psychosocial factors more overtly and concretely in outpatient upper extremity practice. Additional details of this process are outlined in the Full Logic Model provided in Figure 4.1.

Anticipated Barriers and Challenges

The greatest threat to implementation of this program is lack of therapist participation or apathy. If the author cannot garner enough interest in this program, then it will not function as outlined. To mitigate this concern, the author would plan a robust advertisement campaign via ASHT, to target maximal participants from the target audience. This would be done within at least a four-month time frame in advance of the

course to allow time to secure interest from potential participants. Marketing materials will include all the benefits of taking the course, such as earning CEUs, access to the course digitally, and access to course materials for up to one year. If engagement remains low the author would offer participants an incentive for participating, for example fifty percent off the registration fee or offer the course for free for the soft launch phase. Another potential unforeseeable barrier would be if the learning platforms, DigitalChalk and Zoom, experienced technical issues that interrupted dissemination of the program. Since course materials will be accessible for up to one year, this could be mitigated by storing a backup copy of all presentations and materials in a Google Classroom so that the instructor could easily share them later.

Both course components will be delivered online. This means that access to the internet and an electronic device are essential resources for the course and without them, the course could not function. Both the instructors and the participants need access to these technical resources to be able to participate in the program. Ways to mitigate potential technical difficulties for participants would be to encourage individuals without access to these resources personally to use publicly available resources such as those at a library or school. If the instructors were having technical difficulties, they could reschedule the live course component to another day (in the event of a power outage or disruption to the internet). If the instructor became ill and was unable to present the program that would also be an unforeseen barrier. There are two ways to mitigate this. One way would be to have a second instructor trained and ready to deliver the live content. Another option would be to reschedule the course to a later date and reflect this

in the course cancellation policy. The course is intended to have multiple instructors presenting it; however, if the author was unable to find one or more co-instructors this risk could be mitigated by falling back to presenting the course solo.

Environmental factors, such as lack of clinical support to address psychosocial factors or lack of time built into therapists' schedules to address psychosocial factors are potential barriers for this program. To mitigate these factors, the author needs to provide education, data and research that conveys the benefits of addressing psychosocial factors in practice and the potential impacts on patient outcomes. Data regarding potential cost savings or earlier return to work will be helpful to justify the time expenditure.

A final barrier to implementation of this program would be the inability to secure approval from AOTA to furnish AOTA approved CEUs. This risk will be mitigated by the author ensuring continued compliance with the AOTA Approved Provider Program application process. This barrier would not prohibit the program from occurring, however, issuance of AOTA CEUs serves as an incentive to many participants and are preferable to contact hours.

Summary and Conclusions

The key elements of this program include self-directed and interactive online course components to total six hours of continuing education for occupational therapy practitioners, physical therapy, and Certified Hand Therapy practitioners. Content will include assessing and addressing psychosocial factors experienced by clients with upper extremity injuries or conditions in an outpatient, upper extremity practice setting. The educational content is designed to address perceived gaps in therapists' knowledge

related to feasible and available psychological and social assessment and intervention tools. Interventions designed to address these factors utilize techniques including but not limited to relaxation, mindfulness, cognitive behavioral therapy (CBT), completion of a clinical environment assessment, reorganization of the clinical environment, access to private treatment rooms, and inclusion of family supports.

These program elements not only address gaps in knowledge and practice trends but also aim to address the overreliance on biomechanical model approaches to upper extremity care. The author used a biopsychosocial approach and consideration of environmental factors as outlined in the ICF to inform development of this content which supports consideration of social, psychological, and environmental factors on par with the physical factors. Since psychosocial factors can influence a person's successful recovery from an upper extremity injury as much as the physical factors, this innovative program aims to improve the overall health and wellness of any client seeking services in an outpatient hand therapy practice setting. Additionally, this program aims to influence upper extremity practice trends to incorporate psychosocial approaches as a standard of care in clinical practice.

CHAPTER FIVE – Program Evaluation Research Plan

Program Scenario and Stakeholders

Overview

The program *Unlocking Biopsychosocial Hand Therapy* is an online, continuing education unit (CEU) course focused on increasing awareness of psychosocial factors, assessments, and interventions to occupational therapy (OT), physical therapy (PT), and Certified Hand Therapy (CHT) practitioners working in the upper extremity practice settings (i.e., hand therapy clinics). Participants of this program will earn six American Occupational Therapy Association (AOTA) approved education credits to be used toward licensure or certification. The author is the primary curator of content, with collaboration and contributions from content experts. For the soft launch phase of this program, the author will use a non-experimental, descriptive research design that combines qualitative (formative) and quantitative (summative) data (mixed methods) to examine therapists' responses to the educational program.

Intended Users of Program Evaluation Research Findings

The intended audience for this course consists of occupational therapy, physical therapy, and Certified Hand Therapy practitioners who have practiced in upper extremity rehabilitation settings for at least one year; see Figure 5.1 for an example of an intended user of this program. Upper extremity therapists and physicians frequently communicate regarding recommended treatments, therefore having the support of referring providers is essential. By communicating program evaluation research findings to referring providers, there is a greater chance of program implementation, outreach, and growth

opportunities. Clients seeking rehabilitation services to treat an upper extremity injury or condition will also benefit from this program; the knowledge and skills gained by therapists taking the course are intended to be used clinically for the purposes of improving client outcomes.

Research Practice Scenario

Figure 5.1

Case Scenario

A client is referred to an occupational therapy practitioner, who specializes in upper extremity rehabilitation, for left-hand stiffness and contractures three months following emergency fasciotomy to treat compartment syndrome. The client developed compartment syndrome after injecting himself intravenously with illicit drugs and did not wear the recommended orthosis furnished in the hospital to minimize the risk of contractures. The treating occupational therapy practitioner experiences decreased confidence in how to address behavioral health issues in the hand therapy setting but recognizes that this will be essential to maximize client participation and compliance with the plan of care. The occupational therapy practitioner searches for available educational courses on the American Society of Hand Therapist (ASHT) website and learns about the *Unlocking Biopsychosocial Hand Therapy* course; then registers and takes the course. Following participation in the course, the occupational therapy practitioner demonstrates increased knowledge, awareness, and confidence regarding the psychosocial factors affecting the newly referred client.

Vision

Short-term Vision

The short-term vision is to pilot *Unlocking Biopsychosocial Hand Therapy* to examine the effectiveness of the course in increasing therapists' knowledge and awareness regarding psychosocial factors and increasing therapists' confidence and competence regarding the use of psychosocial assessments and interventions. Additionally, the author will evaluate therapist impressions regarding their overall

experience including aspects of the course delivery and any recommendations for improvement. This will be used to help inform future iterations of the course.

Long-term Vision

The long-term vision for this research is to improve patient outcomes using a more holistic approach by highlighting the psychosocial aspects of upper extremity injuries and conditions, which are under-addressed in upper extremity practice. The program will serve as a basis for change in practice trends; to move from a primarily biomechanical model of upper extremity practice to a biopsychosocial practice model. When the program evaluation data demonstrate that the course meets its intended goals, the intent is to use this data as a springboard for a future study examining whether improved therapist knowledge and competence in addressing psychological and social factors - on par with biological factors - leads to more successful patient outcomes than using biomechanical approaches alone. More successful patient outcomes will be defined as a patient's self-report of decreased disability and increased quality of life which will be examined via case studies or single-subject research design.

Engagement of Stakeholders

Stakeholder engagement before, during, and following program implementation will be helpful to ensure robust and comprehensive programming that is successful over time. The author will engage stakeholders when developing course content to inform and clarify aspects of the course that will be most important to include. Key stakeholders include clients with upper extremity injuries or conditions; occupational therapy practitioners, physical therapy, and Certified Hand Therapy practitioners; referring

physicians; the American Occupational Therapy Association (AOTA); and the researcher/author.

Occupational therapy practitioners, physical therapy, and Certified Hand Therapy practitioners are the primary intended users since they will be participating in the course and will be engaged in both the qualitative and quantitative evaluation components. Their responses to the program will not only provide quantitative evidence that the program is meeting its intended goals but will also provide valuable feedback regarding how to modify and further develop the course for future iterations.

Clients with upper extremity injuries or conditions are also among the stakeholders. Clients drawing services from a program-trained professional could receive better support for their psychosocial needs. Since the asynchronous course component will happen prior to the live course component and there could potentially be several weeks or months between these two activities, therapists may start implementing some aspects of the program during this time. Clients will serve as indirect recipients of the program as they would receive the types of interventions promoted within the course, thus their responses to the interventions may influence therapists’ post-course formative and summative evaluations.

Physicians, such as orthopedic surgeons, are a key group of stakeholders because they refer their clients to upper extremity services. In compliance with regulatory bodies such as insurers and state regulatory bodies, upper extremity specialists require a physician referral to provide services, such as biomechanical and psychosocial interventions. Upper extremity therapists and physicians frequently communicate

regarding their client cases to discuss pertinent medical history, the therapy plan, recommended treatments, and client responses to interventions. Physicians' buy-in and responses to the program will impact therapists' and clients' attitudes toward program content. Therefore, having the support of referring providers is essential and will impact the formative and summative aspects of program evaluation.

Another group of stakeholders is the AOTA Approved Provider Program (APP) as they will be approving the program for AOTA-approved CEU credits. AOTA CEUs will serve as an incentive for participants. AOTA APP professional development activities are formally recognized in 38 states across the United States and communicate to occupational therapy practitioners and state licensing boards that the course activities reflect evidence-based, occupation-centered practice (AOTA, 2022). The author will be launching the program under the auspices of their own continuing education company, Right Hand Therapy, LLC, which is an AOTA Approved Provider. Thus, this author, as a researcher and primary person involved in program delivery, is also an essential stakeholder ensuring the successful planning, implementation, evaluation, and reflection of the program. Right Hand Therapy, LLC will engage the AOTA APP via their application process prior to program implementation to ensure that participants receive credit for their participation in the program.

Table 5.1

Sample of a Basic Matrix for Organizing Stakeholder Information

Stakeholder or Stakeholder Group	**Type of Involvement (Planning, Implementing, Reflecting)**	**Possible Role(s)**	**Specific Interests**
Researcher and CEO of CEU company	P, I, R	Overseeing and coordinating logistics, administering program activities, gathering participant registrations, and data collection	Successful implementation, participant satisfaction, usable data via design rigor and robust outcomes
Direct program recipients: course participants (PTs, OTs, and CHTs)	P, R	Consultation on logistics and methodology, participation in program activities	Design rigor and robust outcomes, increased knowledge, and new skills acquisition, earning CEUs
Indirect program recipients: clients of upper extremity services	R	Participation in therapy services that resulted as the outcome from therapists who participated in the program	Design rigor and robust outcomes
Referring providers: physicians	P, R	Consultation on logistics and methodology	Design rigor and robust outcomes
AOTA	P, I, R	Approval and dissemination of AOTA CEUs, ongoing approval via AOTA APP annual report process	Professional development activity quality stands up to rigor of approved provider program

Eliciting Stakeholder Involvement

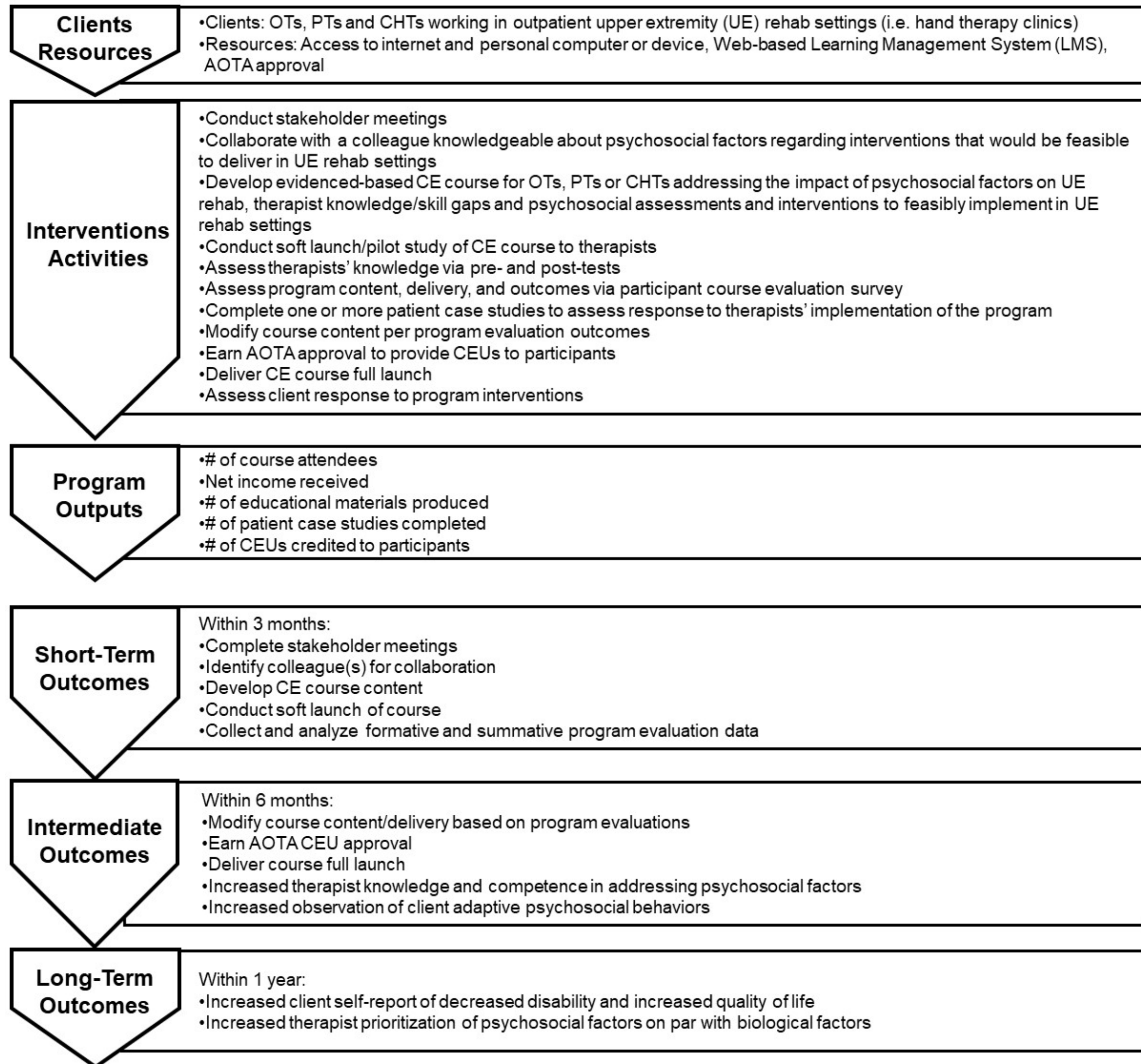
During program development, the author plans to identify and engage stakeholders including therapists, physicians, and clients at various levels such as via

online surveys and individual meetings. First, the author will plan to disseminate an emailed survey to a large group of therapist stakeholders (intended users of the program) to solicit feedback regarding program logistics, content, and methodology. Surveys can be distributed by the American Society of Hand Therapists (ASHT) and AOTA. ASHT (2022) enables members to connect with other ASHT members via email for the purposes of research. AOTA (2021) allows members to post a survey link for research or projects via their CommunOT webpage using the "Survey Requests" thread in the General Forum or in a Special Interest Section (SIS) community. The survey will include an opt-in for participants to give permission to be contacted for further participation via a stakeholder meeting. In addition to therapists, the author will approach physicians and clients from an outpatient, hand therapy practice to participate in either one group meeting or individual meetings, depending on their preferences. The author will accommodate any alternate methods or preferences of engagement. Meetings will be virtual, as this is the most feasible and accessible option and eliminates geographical and time zone challenges.

Prior to the meeting, the author will send stakeholders background information related to the program and its significance. This will include a simplified logic model (see Figure 5.2), a one-page literature review including citations and references to pertinent research articles that serve as the basis for the program content, and a preliminary course breakdown. This breakdown will include course learning objectives, course schedule, the estimated date for dissemination, and resources required for individuals to participate.

Figure 5.2

Simplified Logic Model for Use with Stakeholders



Preliminary Exploration and Confirmatory Process

During stakeholder meetings, the author will provide an explanation of the program evaluation research design and methodology, and intentionally solicit input regarding course content and research questions to ensure that program evaluation methods will yield usable data. For example, discussions regarding course content will

elicit which evidenced-based assessments or patient-reported outcome measures are currently accepted, available, and utilized in upper extremity clinical practice. This type of information will maximize the chance that therapists will integrate program content into their practice. Stakeholder feedback regarding which research questions are most important to include is imperative. For example, if a client or therapist stakeholder reveals that the pre- or post-test questions are too lengthy or confusing, this is an opportunity to collaborate with stakeholders regarding how to best present the question so that participants are most likely to answer it.

Stakeholders bring various perspectives and value to the program which is important to acknowledge. To accomplish this, the author will listen to all stakeholder input without interruption, solicit questions, and articulate the value of their input. The author will create a list of "non-negotiable" aspects of the program and be prepared to defend these aspects more vigorously versus those that can be more readily modified based on stakeholder input. Similarly, the author will listen for aspects of the program that stakeholders deem as priorities and delineate ways to incorporate these items into the program design. Identifying and discussing these aspects will be important to minimize confusion and to ensure a clear vision of the program's goals, objectives, outputs, and outcomes.

A powerful way to achieve buy-in and ensure that each stakeholder understands the potential impact of the program is to share an example of a practice case scenario of a therapist who would benefit from taking the *Unlocking Biopsychosocial Hand Therapy* course. The author will also highlight the potential benefits or uses of the program

evaluation research. For example, a physician-owned therapy clinic could use the program evaluation data to advertise on their website how their therapists, who participated in the course, address clients' psychosocial needs in addition to their physical impairments. A client seeking holistic care following an upper extremity injury may choose to attend therapy at that clinic because of the advertisement. To close the stakeholder meeting, the author will restate the highlights of the conversation, summarize stakeholder feedback, and outline the plan to address the meeting action-items.

Program Evaluation Research Questions by Stakeholder Group

Table 5.2 displays sample program evaluation research questions that are organized by stakeholder group: the research/author, therapists (intended users), clients (indirect recipients), physicians, and AOTA. These questions represent the potential concerns of each stakeholder group and are designed to produce data regarding the effectiveness of this program to meet its stated objectives. A comprehensive list of stakeholder questions is provided in Appendix A.

Table 5.2

Stakeholder Program Evaluation Research Questions

Stakeholder or Stakeholder Group	Types of Program Evaluation Research Questions
The researcher and CEO of Right Hand Therapy, LLC	***Formative:*** ● Was the program content and delivery sufficient for the participating rehabilitation professionals to begin using the skills that were taught? ● Did the program modes of delivery meet participants' learning needs in terms of access to materials and ease of use? ***Summative:*** ● Will the program participants report increased awareness of the role of the therapist in addressing psychosocial factors impacting UE outcomes? ● Will the program participants report increased knowledge of psychosocial factors, assessments, and interventions?
Direct program recipients: course participants (PTs, OTs, and CHTs)	***Formative***: ● Was the information presented relevant? ● Was the information presented too easy or too complicated? ● Was teaching delivered in a format suitable for learning? ***Summative***: ● Did participants gain increased awareness of the role of upper extremity therapists in addressing psychosocial factors? ● Did participants gain needed knowledge of psychosocial factors, assessments, and interventions consistent with program objectives?
Indirect program recipients: clients of upper extremity services	***Formative***: ● Was the program content and delivery sufficient for the participating rehabilitation professionals to be competent using the skills that were taught? ● Do the new skills and interventions learned by therapists participating in the program cost extra money to the client or require additional therapy visits to implement?

	Summative: ● Will the program participants report increased awareness of the role of the therapist in addressing psychosocial factors impacting UE outcomes? ● Does the research data show that therapist participation in this program improves their knowledge and skills consistent with program objectives?
Referring providers: physicians	***Formative***: ● Does the content of the program match the clinic's organizational goals? ● Does the course content align with client needs and the clinic resources available to meet those needs? ***Summative***: ● Will the research data show that the intervention led to the desired change in knowledge, confidence, or skill competence? ● Can the research data be used to demonstrate improved quality of care provided to recipients of the interventions taught in the program?
AOTA	***Formative:*** ● Do participants report an increased understanding of the distinctive role of occupational therapy in the provision of psychosocial services in upper extremity practice? ● Are participants confident that they will be able to advocate for the role of occupational therapy as a change agent in areas relevant to the project? ***Summative***: ● By which assessment methods will learners demonstrate their attainment of the program objectives? ● Can the research data be used to demonstrate desired change in participants as a result of the program?

Research Design

This project will utilize a mixed methods research design that combines both qualitative and quantitative methods. The qualitative research design will include

formative evaluation via the administration of a post-course survey consisting of open-ended, multiple-choice, and short-answer questions. These questions will elicit data regarding participants' experiences taking the course and areas for program improvement. The quantitative research design will include summative evaluation data obtained via a pre-/posttest administered to course participants via the learning management system, DigitalChalk. The questions will elicit data measuring how well the program met its stated goals.

Methods

To publish the results of the study in a peer-reviewed journal, the author must first obtain Institutional Review Board (IRB) approval. This will need to occur through an affiliation with a university program or research hospital. For example, Boston University assists students through the IRB application process on their webpage and provides information regarding which type of application to submit (Boston University Research Support, n.d.). To ensure confidentiality, the author does not plan to collect identifiable information from participants. The only personal data that will be collected include profession, educational background, and years of experience, which cannot be linked back to individual participants. This means that the research design should fall under the exemption from the provisions of the Common Rule because it does not collect any identifying information from the subjects (BUMC, 2022). Therefore, the author will utilize the exempt review application process. Prior to collecting any data, the author will need to obtain participants' informed consent. Informed consent will be documented and provided via a statement to participants communicating that their participation is

voluntary and that they can stop participating at any time without consequence to them (see Appendix B).

The author will recruit program participants via AOTA, ASHT, and emails sent through Right Hand Therapy, LLC. Methods for recruiting participants via AOTA and ASHT will be accomplished via their online request processes as described in the previous subsection “Eliciting Stakeholder Involvement and Ensuring that Evaluation Results will be Used”. All recruitment will occur virtually via an emailed link, or the link provided through the Right Hand Therapy website. Prior to being able to participate in the study, subjects will acknowledge the informed consent statement by clicking on the link to proceed to the study (see Appendix B). Inclusion criteria will include occupational therapy and physical therapy practitioners with one year of clinical experience treating clients for upper extremity injuries or conditions. Exclusion criteria will include therapists who have less than one year of clinical experience treating clients for upper extremity injuries or conditions and participants who are not occupational or physical therapy practitioners.

Qualitative Methods

Formative Data Collection

Formative data collection will occur following the online, live course completion and occur via online survey on the Survey Monkey platform. The author (presenter) will provide participants with a link to the survey using the chat feature in Zoom. The survey will be administered to all willing participants of the CEU course. Although the exact number of participants may vary for each course instance, ideally the course would have

40 participants of which at least 20 would agree to complete the survey. This survey will utilize open-ended, multiple choice, and short-answer questions to produce qualitative and quantitative data from course participants regarding their experience in the course. Sample formative evaluation questions are outlined in Appendix C.

Methods for Formative Data Management and Analysis

Participants will use a laptop, computer, phone, or another internet-accessible device to input their responses into Survey Monkey. The data can then be downloaded to the author's local computer which is backed up by a local cloud drive. To analyze and interpret the qualitative data, the author will use research software, such as NVivo, to determine patterns of terms, phrases, and sentences contained in therapist responses. The author will plan to analyze and interpret the quantitative data using ordinal coding. For example, the coding for perceived therapist confidence will be "1" (= not confident at all), "2" (= slightly confident), "3" (= somewhat confident), "4" (= fairly confident), and "5" (= completely confident).

University programs provide students and faculty free access to research software such as NVivo, which is a software program used for qualitative and mixed-methods research, so the researcher would download this program to use for qualitative data analysis. NVivo imports from a range of data formats including PDF, which is also used by Survey Monkey. NVivo will allow the author to identify frequently occurring terms in responses and catalog them automatically. To enhance the rigor of the analysis, the author, and a colleague from outside the study would also read the downloaded texts to identify and catalog themes or recurring words and compare these to the results from

NVivo.

Quantitative Methods

Summative Data Collection

In this study, the independent variable is the education provided via a professional development continuing education (CEU) course. The course aims to educate occupational and physical therapy practitioners about client psychosocial factors often seen with upper extremity injuries or conditions. The course will be delivered in two parts online. The first component will be delivered asynchronously online and will be a prerequisite to the second course component. The second course component will be scheduled and presented live online via Zoom. The amount of time between the two course components will vary depending on when a participant registers.

The objectives of the course, or dependent variables, include increased therapist knowledge of psychosocial factors, assessments and interventions, increased awareness of the role of the therapist in addressing psychosocial factors impacting upper extremity outcomes, increased therapist confidence regarding their role in psychosocial assessment and intervention, and increased therapist competence in administering psychosocial assessments and interventions. The summative research design will be aimed at measuring how well the program met its stated objectives.

The summative evaluation data will be collected and scored via the learning management system, DigitalChalk, using the platform's "Add a Test" functionality. The author will accomplish this via a course pre- and post-test administered to participants online. Participants will take the pre-test prior to engaging with any course content, and

the post-test will be administered after the completion of the live course session. The pre/post-test will contain the same questions and will be scored using a rating scale from 0% to 100%. DigitalChalk automatically scores tests (in percent). See example summative evaluation questions in Appendix D.

Methods for Summative Data Management and Analysis

Pre-test data collection will occur at a day and time of the therapists' discretion and on a device of their choosing. DigitalChalk automatically scores pre-/post-test data and reports the score in percentages. Post-test data collection will occur directly after program completion while participants are still within the live Zoom environment. All data will be stored in the author's DigitalChalk account and then scores can be compiled and downloaded to an Excel spreadsheet and stored on a local computer which is backed up by a local cloud drive. The goal of data analysis will be to express the degree of relationship or association between pre- and post-test variables. Thus, the types of statistics that would be suitable for the data collected will be correlational.

Anticipated Strengths and Limitations

The author will serve as the researcher and CEO of the company presenting the course. Since the company stands to profit from the course, this could be viewed as a conflict of interest i.e., as an incentive to report "positive" research results to encourage more participation. The author would need to disclose this information during the course and as part of the research materials. The advantage of the course being presented by a privately owned company is that the company can opt to fund and launch the course as an internal development project, even absent sufficient participant engagement to cover

costs (using company funds set aside for this purpose).

An external factor that may affect program evaluation research is the inability to affiliate with a university or hospital with an IRB to approve the research. The author would like to disseminate research findings via the Journal of Hand Therapy (JHT) and therefore would need IRB approval. Alternatively, the author could still collect and use program data to inform future iterations of the course and to offer CEUs for the course without publishing the data. Another limiting factor to consider is price; if the course is too expensive it may be cost prohibitive for some participants. “Zoom fatigue” is also a concern. While having the course offered online/virtually allows more participants to attend, some participants may prefer in-person courses.

Research shows that psychosocial factors are often under-addressed in hand therapy settings. However, some therapists may feel their practice does not have this shortcoming, which could lead to defensive reactions if the material is presented in an accusatory rather than supportive manner. The author intends to use examples from their own practice, which inspired the development of this project, to illustrate the importance of the content and to provide a supportive educational experience for all experience levels.

CHAPTER SIX – Dissemination Plan

Summary

Unlocking Biopsychosocial Hand Therapy is a continuing education unit (CEU) course developed for occupational therapy (OT), physical therapy (PT), and Certified Hand Therapy (CHT) practitioners, who have at least one year experience working in upper extremity (UE) practice settings, i.e., hand therapy clinics. The course will be delivered in two components and emphasizes the importance of biopsychosocial practice when treating clients with upper extremity injuries and conditions. Participants will engage in a two-hour, online, asynchronous component, where they will learn about psychosocial factors most associated with upper extremity injuries such as post-traumatic stress disorder (PTSD), anxiety, and depression, and the role of social support. This component will also present the use of psychosocial assessment tools feasible in upper extremity practice. Once this has been completed, participants will partake in a four-hour, virtual, live component, which will consist of lectures and small group discussions regarding evidenced-based psychosocial interventions including but not limited to cognitive and behavioral approaches, integrative pain management techniques, and use of intentional clinic design to maximize successful client outcomes.

Dissemination Goals

Dissemination will begin following the creation and first run of the course and will focus on achieving the following goals:

- Long-term Goal: Dissemination of *Unlocking Biopsychosocial Hand Therapy* to both primary and secondary audiences will result in a measurable increase in

upper extremity specialists practicing within a biopsychosocial model within three years.

- Short-term Goal 1: Dissemination of *Unlocking Biopsychosocial Hand Therapy* to the primary audience will result in more than 20 participants registering for the second iteration of the course in year two.
- Short-term Goal 2: Dissemination of *Unlocking Biopsychosocial Hand Therapy* to the secondary audience will result in three clinicians registering for the second iteration of the course due to their employers' request in year two.
- Short-term Goal 3: Dissemination of *Unlocking Biopsychosocial Hand Therapy* to both primary and secondary audiences will result in clinicians requesting that the course be offered more frequently or at times in addition to the scheduled date within two years.

Primary Target Audience

The primary audience for disseminating the impact of *Unlocking Biopsychosocial Hand Therapy* are clinicians who work in upper extremity rehabilitation settings. By providing opportunities for education and skills training, clinicians will be able to translate their learning into practice for the purpose of improving the quality of life of individuals impacted by upper extremity injury or conditions. Additionally, since the sustainability of the program relies on ongoing clinician participation, they are the most important audience to reach.

Key Messages for Primary Target Audience

1) Psychological and social factors impact client outcomes alongside physical factors. Clinicians, like you, play an important role in the timely screening of psychological symptoms and identification of individuals who may need additional support following their traumatic experience (Ladds et al., 2017). By registering for *Unlocking Biopsychosocial Hand Therapy,* you will gain the knowledge and skills to assess and address the most common factors associated with upper extremity injuries and conditions to maximize your clients' functional outcomes.
2) Practice factors such as time constraints, lack of knowledge or skills, difficulty engaging the client or difficulty prioritizing interventions are valid and can inhibit a clinician's ability to address psychosocial factors (Van der Velde et al., 2016). By registering for *Unlocking Biopsychosocial Hand Therapy,* you will learn how to select, prioritize, and provide feasible, evidenced-based interventions to address psychological and social factors impacting client outcomes, where to find available resources, and when to refer your clients to outside services.
3) When you participate in *Unlocking Biopsychosocial Hand Therapy*, you will earn CEUs from the comfort of your own home. The course can be completed online from any device with Internet access, and you will earn six American Occupational Therapy Association (AOTA) approved CEU credits to be used toward licensure or certification.

Sources/Messengers for Primary Target Audience

An influential organization to help spread the key messages to clinicians is the American Society of Hand Therapists (ASHT). This organization reaches over 3,700 members, 85% of whom are upper extremity therapists. According to HTCC (2023), ASHT is the pioneer for advancing the profession of upper extremity practice since 1977, including founding the Hand Therapy Certification Commission (HTCC) which is responsible for setting the standards for hand therapy practice and establishing the certification program. ASHT sponsorship enhances the credibility of the program with target audiences.

Dissemination Activities, Tools/Techniques, Timing, and Responsibilities for Primary Target Audience

To reach clinicians, the author will disseminate marketing materials electronically via ASHT's website using their sponsorship opportunities, via the American Occupational Therapy Association (AOTA) through their free marketing tools for AOTA Approved Providers, and through the author's company, Right Hand Therapy, LLC. The author will also disseminate the positive results of the program evaluation research by presenting it at the annual ASHT conference and publishing it in the Journal of Hand Therapy, a peer-reviewed journal designed for upper extremity specialists.

Table 6.1

Dissemination Activities for the Primary Audience

Category	Description of Activity	Prioritization	Person Responsible
Written information (e.g., brief, brochure, journal article, newsletter)	The author will publish the positive results of the program evaluation research in the Journal of Hand Therapy, a peer-reviewed journal designed for upper extremity specialists.	Low: to be completed last following the second iteration of the course/in the second year	Lisa Owen (the author)
Electronic media (e.g., website, podcast, videotape)	The author will disseminate marketing materials and advertisements electronically via: • ASHT's website using their sponsorship opportunities • American Occupational Therapy Association (AOTA) through their free marketing tools for AOTA Approved Providers • the author's company website, Right Hand Therapy, LLC	High: to be completed following the initial and all subsequent iterations of *Unlocking Biopsychosocial Hand Therapy*	Lisa Owen (the author) and a participant therapist with a successful client outcome as a result of the program
Person-to-person contact (e.g., briefing, conference, workshop, academic course, meeting).	The author will: • disseminate program evaluation research findings through a poster presentation at the annual ASHT conference. • incorporate client and therapist testimonials into future iterations of *Unlocking Biopsychosocial Hand Therapy*.	Medium: to be completed following at least two iterations of *Unlocking Biopsychosocial Hand Therapy*	Lisa Owen (the author)

Secondary Target Audience

The secondary audience this program aims to reach are referring physicians, such as orthopedic surgeons. In compliance with regulatory bodies such as insurers and state regulatory bodies, upper extremity specialists require a physician referral to provide services, such as biomechanical and psychosocial interventions. Hand therapists and physicians frequently communicate regarding recommended treatments, therefore having the support of referring providers is essential. By spreading the key messages of the program to referring providers, there is a greater chance of program implementation, outreach, and growth opportunities.

Key Messages for Secondary Target Audience

The key message to referring providers are as follows:

1) Psychological and social factors impact your patients' outcomes and when left unaddressed can lead to problems such as chronic pain, increased healthcare costs (Chown et al., 2018), prolonged therapy visits (Berstein et al., 2019), and overall decreased health and well-being. Clinicians working with your patients play an important role in the timely screening of psychological symptoms and identification of individuals who may need additional support following their traumatic experience (Ladds et al., 2017). When therapists register for *Unlocking Biopsychosocial Hand Therapy,* they will gain the knowledge and skills to assess and address the most common factors associated with upper extremity injuries and conditions. This can maximize your patients' functional outcomes and minimize costly and prolonged therapy.

2) Psychosocial interventions are within the scope of practice of upper extremity specialists. When you identify a patient experiencing difficulty such as increased anxiety, fear, or difficulty coping with their injury, help them by requesting interventions such as mindfulness, breathing techniques and cognitive behavioral therapy via your referral for rehabilitation services. These services can easily be added to the therapy plan alongside approaches such as therapeutic exercise, manual therapy, and orthotic fabrication.

Sources/Messengers for Secondary Target Audience

ASHT has physician members and thus can also reach the secondary audience. An influential spokesperson for referring providers will be a clinician who participated in *Unlocking Biopsychosocial Hand Therapy*. Ideally, this clinician spokesperson will have a success story working with a client after participating in this course and will provide positive testimonials regarding their and their client's experience.

Dissemination Activities, Tools/Techniques, Timing, and Responsibilities for Secondary Target Audience

To reach referring providers, the author will encourage therapists who participated in the program to spread key messages through peer-to-peer interactions at work. The author will also reach referring providers through ASHT. Table 6.2 below summarizes how and when these activities will reach each target audience.

Table 6.2

Dissemination Activities for the Secondary Audience

Category	Description of Activity	Prioritization	Person Responsible
Electronic media (e.g., website, podcast, videotape)	To reach referring physicians the author will disseminate marketing materials and advertisements electronically via ASHT's website using their sponsorship opportunities.	High: to be completed following the initial and all subsequent iterations of *Unlocking Biopsychosocial Hand Therapy*	Lisa Owen (the author) and a participant therapist with a successful client outcome as a result of the program
Person-to-person contact (e.g., briefing, conference, workshop, academic course, meeting).	To reach referring providers, spokesperson therapists and their clients will share their testimonials through word of mouth within upper extremity practice settings and during follow-up office visits, respectively.	High: to be completed after the first iteration and all subsequent iterations of *Unlocking Biopsychosocial Hand Therapy*	Participant therapists with successful client outcomes as a result of the program

Budget

Table 6.3 outlines the budget for dissemination activities. Most costs occur in year two and total approximately $4,000 to cover travel and fees related to attending the ASHT Annual Meeting in 2024. Additional fees cover publishing fees for the Journal of Hand Therapy. By focusing dissemination activities through ASHT events, the author will reach both primary and secondary audiences.

Table 6.3

Budget for Dissemination Activities

Category	Justification	Year One	Year Two
Sponsorship through ASHT	Three months prior to each course, the author will run a slider ad on the frontpage of the American Society of Hand Therapists (ASHT) website. ASHT has the potential to reach over 3,700 members who are upper extremity specialists (primary and secondary target audiences).	$750 (already accounted for in marketing budget)	$750 (already accounted for in marketing budget)
Conference	ASHT Annual Meeting will take place September 25-29, 2024, in St. Louis, Missouri. Both primary and secondary target audiences attend and present at the ASHT annual conference.	Not presenting in year one.	$245/night based on hotel rates for the 2023 annual meeting = $1,225
Travel	Based on current airplane passenger ticket prices from Manchester, NH (MHT) to St. Louis, Missouri (STL) on Southwest Airlines.	Not traveling in year one.	$429 roundtrip
Food	Stipend per day to cover meal expenses while as ASHT Annual Meeting.	Not traveling in year one.	$50/day = $250 total
Publication Fees	The open access publication fee for the Journal of Hand Therapy is $2,000 excluding taxes (Elsevier, 2023). Both primary and secondary target audiences read and publish in the Journal of Hand Therapy.	Not submitting in year one.	$2,000
Printing	Printing costs for poster presentation at ASHT Annual Meeting.	Not presenting in year one.	$100
		Year One	**Year Two**
	Total	$0	$4,004

Evaluation

Dissemination outcomes will result in an increased demand for the *Unlocking Biopsychosocial Hand Therapy* course and in increased referrals from referring providers for psychosocial interventions to be performed in upper extremity settings. Measurement criteria for the evaluation of the effectiveness of the dissemination plan for the primary target audience includes the number of inquiries and registrations for the second iteration of the course *Unlocking Biopsychosocial Hand Therapy.* The author anticipates that the number of registrations in year two will exceed those from year one and will be measured by comparing the total number of course participants and email inquiries received from each year. Measurement criteria for the evaluation of the effectiveness of the dissemination plan for the secondary target audience includes the number of referrals received from referring providers, who specifically request psychosocial interventions such as cognitive behavioral therapy. The author will measure this by asking therapists who participated in the program to track the number of referrals they receive for these services over the course of one year and report that number back to the author.

Conclusion

The success of *Unlocking Biopsychosocial Hand Therapy* depends on effective dissemination of its key messages including the value of assessing and addressing psychosocial factors to improve patient successful outcomes. Clinicians and referring providers are important audiences to disseminate this information and will be targeted through a variety of methods including person to person contact in orthopedic settings, at future iterations of the course, and at the ASHT annual meeting scheduled for 2024. The

author will also launch a digital advertising campaign and publish an article in the Journal of Hand Therapy.

CHAPTER SEVEN – Funding Plan

Summary

The program *Unlocking Biopsychosocial Hand Therapy* is a continuing education unit (CEU) course delivered online to disseminate knowledge regarding psychosocial factors, assessments, and interventions to occupational therapy (OT), physical therapy (PT), and Certified Hand Therapy (CHT) practitioners who have at least one year experience working in upper extremity (UE) practice settings (i.e., hand therapy clinics). The course will be delivered in two components. Participants will take the first component asynchronously, online, where they will learn foundational knowledge and resources regarding psychosocial assessment factors in upper extremity rehabilitation practice. Once this has been completed, participants will then partake in a virtual, live component, which will consist of lectures and small group discussions regarding psychosocial interventions. Participants of this program will gain knowledge as well as six American Occupational Therapy Association (AOTA) approved CEU credits to be used toward licensure or certification. The knowledge and skills gained by therapists taking the course are intended to be used clinically for the purposes of improving client outcomes.

Available Local Resources

As founder and Chief Executive Officer (CEO) of the continuing education company, Right Hand Therapy, LLC, this author has access to company funds from other activities, such as previous CEU courses and the sale of products, which are invested back into the company for future activities. The program will be part of this funding cycle

since participants will have to pay to register for the course and receive CEUs. Right Hand Therapy, LLC is an AOTA Approved Provider for continuing education, has a website and website management team who assists with graphic design, web design, and marketing.

Needed Resources: Budget

There are several costs associated with delivering the program, which are outlined below (Table 7.1.) and total approximately $6,550 for year one and $7,725 for year two, assuming it is only delivered once per year. Some of these costs will be covered as in-kind contributions from Right Hand Therapy, LLC, including the costs of the website and associated fees for hosting and domain registration, Google Workspace, the platform DigitalChalk, and AOTA Approved Provider fees. They are included in these budget projections because these resources are vital to the delivery of this program, however in practice, they are amortized over the entire business portfolio.

Table 7.1

Budget Projections for Year One and Two

Category	Justification	Year One	Year Two
Website, domain name, privacy protection, and hosting	Required for advertising course and collecting registrations and fees.	$300	$300
Google Workspace for Right Hand Therapy	Provides email handle associated with company name	$6/month = $72	$72
Platform to store and deliver online course content	The platform, DigitalChalk, will be used to develop, store and host the online course and access digital materials. Access to online content will be available for up to 6 months following participant registration.	$360/year + $4.99 for each registrant = $559.60 for 40 participants for one time course delivery	$559.60 for 40 participants for one time course delivery
Personnel			
Author/ presenter	The author will deliver all online content. It will take approximately 24 hours to develop, present and publish the course content online. Following the first run of the course, the author may require up to 2 hours to amend or edit course content in year two.	$125/hour for 24 hours = $3000	$125/hour for 2 hours = $250
Presenter 1	This person will deliver a portion of the online course content.	$125/hour for four hours = $500 for one time course delivery	$500 for one time course delivery
Presenter 2	This person will deliver a portion of the online course content.	$125/hour for four hours = $500 for one time course delivery	$500 for one time course delivery
Presenter 3	This person will deliver a portion of the online course content.	$125/hour for four hours = $500 for one time course delivery	$500 for one time course delivery

AOTA approval process	Enables Right Hand Therapy to issue AOTA CEUs to participants. Approval is required for each new event, and once approved, lasts for five years so long as annual fee is paid.	$350/year + $75 one-time event approval (good for five-year term)	$350
Zoom Account - Pro Plan	Enables up to 100 participants and up to 30 hours duration per meeting	$14.99 for one time course delivery	$14.99 for one time course delivery
Equipment (computer, webcam, and access to internet)	Each participant and speaker will provide their own equipment to participate in the program.	$0	$0
Communication	Communication with presenters and participants will occur online via email or the website, and not require additional monies.	$0	$0
Marketing	Three months prior to each course, the author will run a slider ad on the frontpage of the American Society of Hand Therapists (ASHT) website. ASHT has the potential to reach over 3,700 members who are upper extremity specialists (the target audience). Additional marketing will occur online via the established Right Hand Therapy, LLC email list and through the AOTA website, which is free for approved providers.	$750	$750
Dissemination Activities	See Chapter 6 – Dissemination Plan for details.	$0	$4,004
	Total	**Year One** $6,621.59	**Year Two** $7,800.59

Potential Funding Sources

As previously stated, Right Hand Therapy, LLC will allocate company funds for the course to supplement registration fees paid by participants. On average, CEU courses that furnish AOTA CEUs cost between $30 to $35 per CEU. *Unlocking Biopsychosocial Hand Therapy* will be marketed at $35 per CEU for $210 per participant. The author aims to have approximately 40 participants take part in the course, which would generate $8,400 in registration funds. When this goal is met in both years one and two, the company will become solvent. If there are less than 40 participants, excess costs would be absorbed by Right Hand Therapy, LLC. As discussed in Chapter 5, the author will use a non-experimental, descriptive research design that combines qualitative and quantitative data (mixed methods) to examine therapists' responses to *Unlocking Biopsychosocial Hand Therapy*. Additional funding opportunities, such as research grants, are available through the American Society of Hand Therapists (ASHT) and outlined in Table 7.2. These grants would provide potential sources of funding up to $45,000 to support this research.

Table 7.2

Additional Funding Sources Outside of Right Hand Therapy, LLC

Potential Funding Source	Description	Amount
AHTF Burkhalter New Investigator Grant for Clinical Research in Hand and Upper Limb Rehabilitation	This grant is for clinical research in hand and upper limb rehabilitation.	This funding opportunity is up to $10,000
AHTF Judy Bell Krotoski "Grab the Evidence" Grant For Fundamental Research and Evidenced-based Studies	This grant provides funding for basic science and studies to grow the evidence-base that supports hand therapy and upper limb rehabilitation.	Up to $10,000
ASHT Founders Grant	This grant was developed to promote meaningful research in hand therapy through the funding of one or more grants. At least one member of the research team must be a member of ASHT and proposals are accepted for research within any domain of hand therapy.	Up to $45,000 for 2021

Note. Information retrieved from the American Society of Hand Therapists (2023). *Funding research*. https://asht.org/research/research/funding-research.

Conclusion

The budget and funding for this project are dependent on the activities of Right Hand Therapy, LLC. Since the author currently owns and operates this continuing education company, the program will utilize the resources currently available and established which guarantees the author's ability to implement the program from a funding perspective. The author aims to ensure that the program is self-sufficient by collecting sufficient registrations fees to cover the costs of disseminating the program. However, grant opportunities are available through ASHT and can provide an additional source of funding.

CHAPTER EIGHT – Conclusion

Injury or trauma to an individual's shoulder, arm, hand, or fingers impacts their physical, mental, and social well-being. There is a considerable amount of evidence that demonstrates the negative impact of pain on an individual's mental and social well-being, most often being associated with depression, posttraumatic stress disorder (PTSD), and anxiety. Evidence also demonstrates how social factors such as changes in work, social relationships, and overall decreased social well-being impact recovery from an upper extremity injury.

Findings from a literature review suggest that occupational therapy (OT) and physical therapy (PT) practitioners working in upper extremity settings rely heavily on biomechanical assessments and interventions (Braun et al., 2017, Esterhuizen, Naidoo & Govender, 2021, Hand Therapy Certification Commission, 2021, Peters & Johnston, 2017 and Peters et al., 2020), have decreased knowledge regarding psychosocial factors, prioritize treatment of physical functioning, and cite time constraints as barriers to treating psychosocial factors. Treatment that only targets physical factors does not necessarily restore an individual's capacity for occupational performance and participation. This can contribute to problems such as chronic pain, increased healthcare costs (Chown et al., 2018), or prolonged therapy visits (Berstein et al., 2019).

Currently, no program or professional development activity exists that focuses on assessment and management of psychosocial factors for practitioners working in outpatient, upper extremity settings. Addressing psychosocial factors is within the scope of practice for occupational and physical therapy practitioners, and therapists play an

important role in the early screening of psychological symptoms and identification of individuals who may need additional support following their traumatic experience. However, due to the biomechanical focus within upper extremity settings, provision of a holistic care plan remains challenging for therapists. This highlights the need for a training program based in a biopsychosocial approach to care.

Unlocking Biopsychosocial Hand Therapy is a one-of-a-kind professional development course specifically designed for occupational therapy practitioners and physical therapy practitioners which provides education and skills training in psychosocial assessments and interventions. Participants of this program must have at least one-year practice experience working in upper extremity settings and will earn six American Occupational Therapy Association (AOTA) approved professional development credits to be used toward licensure or certification. This course will not only provide an innovative opportunity for clinicians to gain knowledge and skills while earning professional development credits, but more importantly it will ensure that clients are receiving more comprehensive, holistic care following an upper extremity injury.

The knowledge and training provided in this course aims to increase therapist knowledge, competence, and confidence in assessing and addressing psychosocial factors within the context of an outpatient upper extremity practice setting. The long-term goal of *Unlocking Biopsychosocial Hand Therapy* is to raise awareness of the psychosocial aspects of upper extremity injuries and conditions, which are under-addressed in upper extremity practice. The course will provide a safe space to reflect on current practice trends and transform the point of view that therapists do not have the time, knowledge, or

resources to meaningfully address psychological factors, alongside physical factors, in upper extremity practice.

When the program meets its stated goals, the intent is to use this data as a springboard for a future study examining whether improved therapist knowledge and competence in addressing psychological and social factors, along with biological factors, leads to more successful patient outcomes compared to using biomechanical approaches alone. More successful patient outcomes will be defined as a patient's self-report of decreased disability and increased quality of life. This will contribute to the growing body of highlighting the importance of providing biopsychosocial hand therapy.

APPENDIX A – Stakeholder Program Evaluation Research Questions

Stakeholder or Stakeholder Group	**Types of Program Evaluation Research Questions**
The researcher and CEO of Right Hand Therapy, LLC	***Formative:*** ● Was the program content and delivery sufficient for the participating rehabilitation professionals to begin using the skills that were taught? ● Did the program modes of delivery meet participants' learning needs in terms of access to materials and ease of use? ● Is the program self-sustainable? Did the number of program participants and payment received from course registrations cover the costs required to run the program (AOTA APP approval, Zoom, and DigitalChalk fees, website maintenance, etc.)? ***Summative:*** ● Will the program participants report increased awareness of the role of the therapist in addressing psychosocial factors impacting UE outcomes? ● Will the program participants report increased knowledge of psychosocial factors, assessments, and interventions? ● Will the program participants report increased confidence about their role in psychosocial assessment and intervention? ● Will the program participants report increased perceived confidence in using the skills they have gained (administering psychosocial assessments and interventions)?

Direct program recipients: course participants (PTs, OTs, and CHTs)	***Formative***: ● Was the information presented relevant? ● Was the information presented too easy or too complicated? ● Was teaching delivered in a format suitable for learning? ● Was the instruction sufficient for the participants to begin using skills acquired from the program with clients? ● Was the program duration adequate, or should it be shorter or longer? ● Were some aspects of the program more versus less useful or effective? ● Is there anything that should be changed to improve program content or delivery? ● What other key issues or problems faced by participants were not addressed in the program? ***Summative***: ● Did participants gain increased awareness of the role of upper extremity therapists in addressing psychosocial factors? ● Did participants gain needed knowledge of psychosocial factors, assessments, and interventions consistent with program objectives? ● Did participants gain needed skills in administering psychosocial assessments and interventions consistent with program goals? ● Did participants gain perceived confidence in their role in psychosocial assessment and intervention? ● Did participants gain perceived competence in administering psychosocial assessments and interventions?

Indirect program recipients: clients of upper extremity services	***Formative*:** ● Was the program content and delivery sufficient for the participating rehabilitation professionals to be competent using the skills that were taught? ● Do the new skills and interventions learned by therapists participating in the program cost extra money to the client or require additional therapy visits to implement? ***Summative*:** ● Will the program participants report increased awareness of the role of the therapist in addressing psychosocial factors impacting UE outcomes? ● Does the research data show that therapist participation in this program improves their knowledge and skills consistent with program objectives?
Referring providers: physicians	***Formative*:** ● Does the content of the program match the clinic's organizational goals? ● Does the course content align with client needs and the clinic resources available to meet those needs? ● Were program participants sufficiently prepared to apply the learning content in their clinical practice? ***Summative*:** ● Will the research data show that the intervention led to the desired change in knowledge, confidence, or skill competence? ● Can the research data be used to demonstrate improved quality of care provided to recipients of the interventions taught in the program? ● Is delivery of the interventions taught in the program more costly than other interventions?

AOTA	***Formative:*** ● Do participants report an increased understanding of the distinctive role of occupational therapy in the provision of psychosocial services in upper extremity practice? ● Are participants confident that they will be able to advocate for the role of occupational therapy as a change agent in areas relevant to the project? ● Are the long-term goals of the project realistic and achievable? ● Will the project increase awareness of developments in the field? ***Summative***: ● By which assessment methods will learners demonstrate their attainment of the program objectives? ● Can the research data be used to demonstrate desired change in participants as a result of the program? ● Will the research data demonstrate the importance of the role of OT in providing psychosocial services in upper extremity settings?

APPENDIX B – Sample Recruitment Email to Prospective Participants

Dear Colleague,

You are being asked to take part in a research study, *Unlocking Biopsychosocial Hand Therapy*, to determine the role and use of psychosocial assessments and interventions in upper extremity clinical practice. You were chosen because you registered for the course, *Unlocking Biopsychosocial Hand Therapy*. The purpose of the study is to understand to what extent a continuing education course impacts therapists' knowledge and skills competence regarding psychosocial factors, assessments, and interventions in upper extremity clinical practice. Your participation will involve answering the following survey questions and it is estimated to take approximately 15 minutes to complete. Your involvement in the study is completely voluntary, and you may choose not to participate or to stop participating at any time. The results of the research study may be published, but your name will not be used. Your identity will not be associated with your responses in any published format. The information from this study may be useful to upper extremity therapists when determining appropriate psychosocial assessments and interventions to use in clinical practice and will be used to further develop continuing education courses on this topic. There are no foreseeable risks regarding your participation. If you have any questions about this research project, please feel free to email me at lisaowen@bu.edu. By completing this survey, you acknowledge and accept these terms. If you are interested in participating in this study, click here and thank you for your time!

Sincerely,

Lisa Owen, MS, OTR/L, CLT, CHT

APPENDIX C – Sample Questions for Formative Evaluation

The following questions will be posed to participants:

- How would you rate the quality of the presenter (scale of 1 “poor” to 5 “excellent”)?
- How would you rate the quality of the live course presentation (scale of 1 “poor” to 5 “excellent”)?
- To what extent did the content and format of education regarding psychosocial factors, assessments, and interventions meet your learning needs? (open-ended)
- Was the course presented at a day and time convenient to you? (short answer)
- To what extent did the online, asynchronous learning component of the course meet your learning needs? (open-ended)
- To what extent did the virtual meeting platform (Zoom) meet your learning needs during the online, live-interactive learning component of the course? (open-ended)
- Was the program content and delivery sufficient for you to begin using the skills that were taught? (open-ended)
- To what extent did the course meet its stated learning objectives? (open-ended)
- If and/or how will learners use the content provided in the course? (open-ended)

APPENDIX D – Sample Questions for Summative Evaluation

The following questions will be posed to participants:

· Select the scenario that best fits the definition of the biopsychosocial model of practice… (multiple choice)

· Select three psychological conditions commonly experienced by clients with upper extremity injuries or conditions…(multiple choice)

· Choose three evaluation tools that screen for psychological conditions when treating a client with an upper extremity injury or condition…(multiple choice)

· How confident do you feel assessing psychological factors as part of your upper extremity practice? (1 "not confident at all" to 5 "very confident")

· How prepared do you feel to assess psychosocial issues as part of your daily practice? (1 "not prepared at all" to 5 "very prepared")

· To what extent do you feel that assessing psychological factors is important in your practice? (1 "not at all" to 5 "very important")

APPENDIX E – Executive Summary

Unlocking Biopsychosocial Hand Therapy

Introduction

Injury or trauma to an individual's shoulder, arm, hand, or fingers impacts their physical, mental, and social well-being. There is a considerable amount of evidence that demonstrates the negative impact of pain on an individual's mental and social well-being, most often being associated with depression, posttraumatic stress disorder (PTSD), and anxiety. Evidence also demonstrates how social factors such as changes in work, social relationships, and overall decreased social well-being impact recovery from an upper extremity injury.

Findings from a literature review suggest that occupational therapy (OT) and physical therapy practitioners working in upper extremity settings rely heavily on physical body assessments and interventions (Braun et al., 2017, Esterhuizen, Naidoo & Govender, 2021, Hand Therapy Certification Commission, 2021, Peters & Johnston, 2017 and Peters et al., 2020), have decreased knowledge regarding psychosocial factors, prioritize treatment of physical functioning, and cite time constraints as barriers to treating psychosocial factors. Treatment that only targets bodily symptoms does not necessarily restore a person to health even if their physical abnormality has been corrected (Engel, 1977). This can contribute to problems such as chronic pain, increased healthcare costs (Chown et al., 2018), or prolonged therapy visits (Berstein et al., 2019).

There is minimal emphasis on the education standards for upper extremity therapists surrounding the psychosocial implications of upper extremity injuries and

related treatment recommendations. Therapists train in and primarily use a biomechanical approach to care which focuses on physical limitations such as joint flexibility, strength, and endurance. Currently, no program or professional development activity exists that focuses on assessment and management of psychosocial factors for practitioners working in outpatient, upper extremity settings. Addressing psychosocial factors is within the scope of practice for occupational and physical therapy practitioners, and as Ladds et al. (2017) point out, therapists play an important role in the early screening of psychological symptoms and identification of individuals who may need additional support following their traumatic experience.

Unlocking Biopsychosocial Hand Therapy is a professional development course designed for occupational therapy practitioners (OTPs) and physical therapy (PT) practitioners which provides education and skills training in psychosocial assessments and interventions. Participants of this program must have at least one-year practice experience working in upper extremity settings and will earn six American Occupational Therapy Association (AOTA) approved education credits to be used toward licensure or certification. The author is the primary curator of content, with collaboration and contributions from content experts, and the course will be offered online to ensure access to the greatest number of participants. Clients seeking upper extremity services will also benefit from this program; the knowledge and skills gained by clinicians taking the course are intended to be used clinically for the purposes of improving client outcomes.

This course emphasizes a biopsychosocial approach to practice, which links the biological, psychological, and social aspects of wellness. Evidence suggests that

practitioners can use more comprehensive models, such as the biopsychosocial model, to maximize adaptation, early recognition and treatment of psychosocial barriers following upper extremity injuries (Hamasaki et al., 2018; Hannah, 2011; Ladds et al. 2017). Participants will participate in the course in two parts. The first component engages participants in a self-directed, two-hour, online component to learn about psychosocial factors and psychosocial assessment tools feasible for use in upper extremity practice. This component of the course is based in the Humanistic Learning Theory which assumes that motivation is derived from needs, feelings, desire to learn, desire for positive self-growth, and confirmation of self-concept (Braungart, Braungart & Gamut, 2011). By offering self-directed, self-paced modules, learners are provided with a safe learning space that they can access from the comfort of their homes, work, or on-the-go (Milheim, 2012).

Once this has been completed, participants will engage in a four-hour, live, virtual component comprised of lectures and small group discussions. The lectures will include education and training regarding evidence-based psychosocial interventions. Small group discussions will include the use of case scenarios and are based on the Transformative Learning Theory. The key elements of Transformative Learning Theory include expanding existing points of view, learning, and establishing new points of view via a disorienting dilemma i.e., a case scenario, transforming points of view, and critical self-reflection (Mezirow, 1997). The purpose of these discussions is to stimulate dialogue and expose clinicians to various perspectives regarding how to address a client's psychosocial needs following an upper extremity injury. The course will provide a safe space to reflect

on current practice trends and transform the point of view that therapists do not have the time, knowledge, or resources to meaningfully address psychological factors in upper extremity practice settings.

Evidence suggests a multimodal approach maximizes successful outcomes for patients with painful upper extremity conditions including but not limited to carpometacarpal (CMC) joint arthritis (Aebischer, Elsig, & Taeymans, 2016), lateral epicondylitis (Girgis & Duarte, 2020; Yao et al. 2020), pain associated with breast cancer-related lymphedema (Rangon et al., 2022) and shoulder conditions (Marik & Roll, 2017) including adhesive capsulitis (Nakandala et al., 2021). Clinicians need to establish the source of the pain to determine the best approach for pain management (Farzad et al., 2021; Matamala-Gomez et al., 2019; Thieme et al., 2016). In general, research regarding non-pharmaceutical pain interventions primarily supports the use of integrative approaches such as exercise, cognitive and behavioral approaches, and manual therapy. Psychological interventions for individuals who experience symptoms of PTSD, depression, or anxiety point to the use of cognitive behavioral therapy, such as relaxation, with best results using a combination of approaches. One example is a 60 second mindfulness exercise, which Westenberg et al. (2018) found feasible for upper extremity practice.

Social support in general has a significant influence on positive patient outcomes (Chan, Yang & Lauricella, 2020; Davis, Crittenden & Cohen, 2021; Di Tella et al., 2018) and the evidence suggests that targeted approaches such as hand holding from a familiar person (Che et al., 2018; Coan et al., 2017), social networking with people who have

similar first-hand experiences (Riffin et al., 2016) and virtual social networks (Mikal et al., 2020) are also beneficial. There are many aspects of the clinical environment that can be modified to enhance social support, patient satisfaction and health outcomes. They include well-designed rooms, noise control, ensuring ambient room temperature, clear signage for finding the clinic, access to private treatment spaces, effective coordination and communication of the care, proper lighting, access to nature views, access to preferred therapist and appointment times, and access to treatment spaces designed for engagement in occupations. These concepts support a biopsychosocial approach to providing optimal patient care.

Key Outcomes

The short-term goal of *Unlocking Biopsychosocial Hand Therapy* is to assess the extent to which the course increased therapists' knowledge, confidence, and competence regarding the use of psychosocial assessments and interventions. The author will assess how well *Unlocking Biopsychosocial Hand Therapy* met its intended goals through two evaluation methods. The first evaluation method includes administration of a post-course survey consisting of open-ended, multiple-choice, and short-answer questions to elicit data regarding participants' experiences taking the course and areas for program improvement. A second evaluation method will be a pre- and post-test administered to course participants to elicit data measuring how well the program met its stated goals: to improve therapists' knowledge, confidence, and competence regarding the use of psychosocial assessments and interventions.

The long-term goal of *Unlocking Biopsychosocial Hand Therapy* is to raise awareness of the psychosocial aspects of upper extremity injuries and conditions, which are under-addressed in upper extremity practice. When the program evaluation data show that the course meets its stated goals, the intent is to use this data as a springboard for a future study examining whether improved therapist knowledge and competence in addressing psychological and social factors, along with biological factors, leads to more successful patient outcomes compared to using biomechanical approaches alone. More successful patient outcomes will be defined as a patient's self-report of decreased disability and increased quality of life which will be examined via case studies or single-subject research design.

Funding Considerations

The budget and funding for this project are dependent on the activities of the continuing education company, Right Hand Therapy, LLC. Right Hand Therapy, LLC is an AOTA Approved Provider for continuing education, has a website, and a website management team who assists with graphic design, web design, and marketing. As founder and Chief Executive Officer of Right Hand Therapy, LLC, this author has access to resources from previous company activities to help fund *Unlocking Biopsychosocial Hand Therapy*. Additionally, the program will be self-sufficient by collecting sufficient registrations fees to cover the costs of disseminating the program after year two. However, grant opportunities are also available and can provide an additional source of funding.

General Conclusions

For decades clinicians practicing in the upper extremity rehabilitation community have discussed the impact of psychosocial factors on their clients' outcomes and the need to address this more in practice. The time for action is now. *Unlocking Biopsychosocial Hand Therapy* will not only provide an innovative opportunity for clinicians to gain knowledge and skills while earning professional development credits, but more importantly it will ensure that clients are receiving more comprehensive, holistic care following an upper extremity injury.

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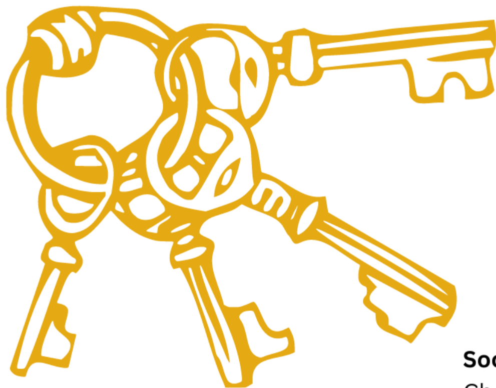
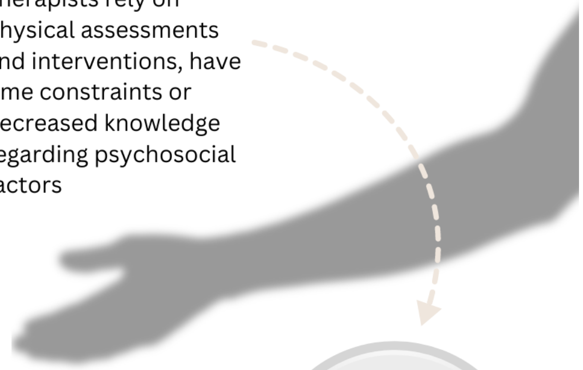
APPENDIX F – Fact Sheet

Unlocking Biopsychosocial Hand Therapy

Lisa Owen, MS, OTR/L, CLT, CHT
OTD Candidate

Upper extremity injury can lead to....





Rehabilitation
Therapists rely on physical assessments and interventions, have time constraints or decreased knowledge regarding psychosocial factors

Physical
Wounds, pain, swelling, limitations in joint flexibility, strength, endurance, etc.

Psychological
Pain, fear, avoidance, changes in body perception, depression, anxiety, negative affect

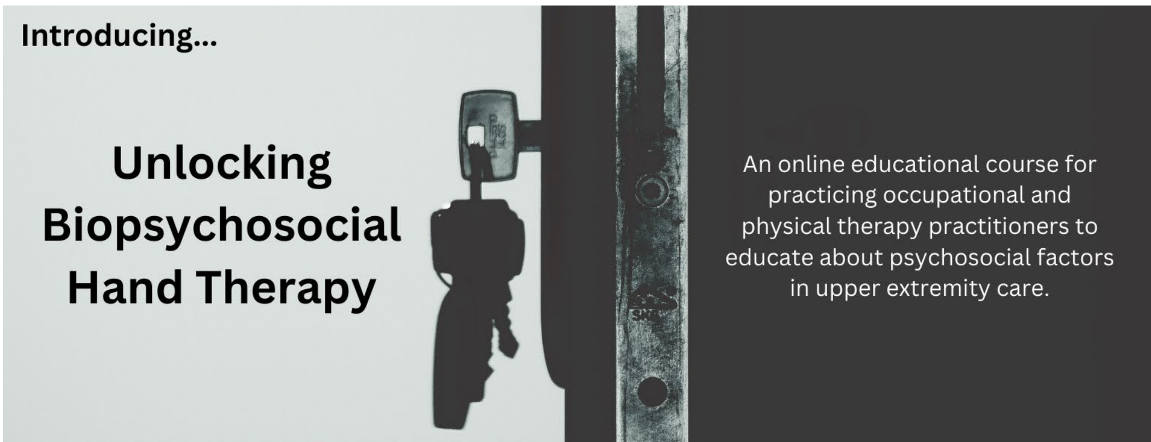
Social
Changes in work, social relationships, roles and routines

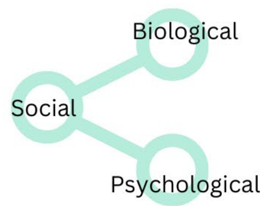
No educational program exists addressing psychosocial factors in upper extremity care.

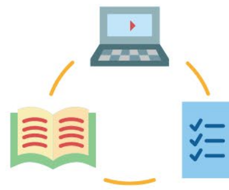
Treatment that only targets bodily symptoms does not necessarily restore a person to health even if their physical abnormality has been corrected (Engel, 1977)

This can contribute to problems such as chronic pain, increased healthcare costs (Chown et al., 2018), or prolonged therapy visits (Berstein et al., 2019).

Talaei-Khoei et al. (2016) assert that early identification and treatment of negative affect may be more cost effective than biomedical interventions such as surgery or medication.







Biopsychosocial Approach

- Pain Management: exercise, manual therapy, cognitive and behavioral approaches
- Social Support: handholding with familiar others, virtual social networks
- Interventions for PTSD, anxiety or depression: Cognitive Behavioral Therapy (CBT)
- Clinical Environment: well-designed treatment spaces, clear communication

Asynchronous

- 2-hours/2 CEUs
- Self-directed modules
- Learn about psychosocial factors and psychosocial assessment tools

Live/Interactive

- 4-hours/4 CEUs
- Lectures and small group discussions
- Learn about evidence-based psychosocial interventions feasible for use in upper extremity practice

Resources

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