

**Optimizing Educational Resources for Upper Extremity Conditions in Occupational
Therapy**

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Abstract

Upper extremity conditions or injuries significantly impact individuals' ability to participate in daily occupations. Access to clear, accurate, and patient-friendly educational materials is essential for promoting self-management and adherence to treatment recommendations. This doctoral capstone project aimed to develop and evaluate educational resources to be used within an outpatient hand therapy clinic. Key components of the project included completing a comprehensive needs assessment, reviewing current evidence-based practices, and implementing updated materials to support patient education. The resulting materials improved patient understanding of their diagnosis and treatment and supported the overall delivery of occupational therapy services. This project highlights the role of occupational therapy in providing patient education and the importance of accessible, well-designed resources in the hand therapy setting.

Optimizing Educational Resources for Upper Extremity Conditions in Occupational Therapy

Injuries and disorders of the upper extremity, such as fractures, arthritis, nerve compression or damage, and tendon injuries, can affect individuals of all ages. These conditions can interfere with an individual's ability to grasp, lift, or perform fine motor tasks, which are needed to complete everyday activities like dressing, eating, working, or managing household tasks. From 2012 to 2021, it is estimated that 39,160,365 individuals have presented to the emergency department for an upper extremity injury (Eckhoff et al. 2023). Nerve compression disorders, such as carpal tunnel syndrome, have a prevalence rate of 3% in the general population which equates to around 9 million individuals (Nadar et al. 2023). The loss of upper extremity function can lead to reduced independence, frustration, and lower quality of life. Occupational therapy plays a vital role in helping individuals regain function by tailoring interventions to the individual that focus on improving strength, coordination, mobility, task or environmental adaptations, and, importantly, education.

Throughout the doctoral capstone experience, the student assessed educational materials for commonly seen upper extremity conditions and gain advanced clinical skills. The student navigated the needs assessment process, conducted a literature review of current best practices of occupational therapy for upper extremity conditions, and determined the occupational model used to guide the project. The purpose of this capstone project was to update educational handouts through evidence-based research to align with best practices, meet health literacy needs of the patient population, and improve accessibility for clinicians. In addition, the student worked closely with the site mentor to gain advanced clinical skills in hand therapy through observations

and direct patient care. This paper outlines the capstone project plan, implementation, evaluation process, impact, and sustainability plan.

Needs Assessment

Site Selection

The OT capstone student demonstrated a strong interest in outpatient OT, particularly in hand therapy. Searching through previous site contacts the capstone coordinator was able to get into contact with Holly Brake, a certified hand therapist (CHT) at Community Health Network Noblesville. Brake has supervised students in past fieldwork rotations but would like to have a capstone student to target current clinic needs. Once the site and site mentor were established, the capstone student set up a virtual meeting with the site mentor and capstone coordinator. The student prepared for the meeting by creating a list of several interview questions to determine the current state and desired state of the clinic. The questions were determined based on current knowledge of the site and current practices in hand therapy, see Appendix A for the listed questions.

Interview Summary

The interview with the capstone site mentor provided insightful information regarding topics to pursue for the capstone project and important background information. A typical treatment session for the site mentor starts with a warm-up activity, such as the bike or NuStep, followed by condition-specific stretches and strengthening, and then hands-on work. The CHT often utilizes soft tissue mobilization techniques and other various modalities on the patients, such as the Graston technique, tissue massage, range of motion (ROM), scar management, and more. In addition, the CHT sees post-operative patients from hand surgeons in the building to

create custom splints. Common splints include wrist immobilization for distal fractures/injuries, safe hand position for metacarpal fractures/injuries, mallet, and Muenster for tendon and ligament injuries. The site mentor and other OTs meet with the hand surgeons located at this facility a couple of times a year to have journal discussions and stay up to date on relevant evidence. Additionally, therapists at the clinic use the Diagnosis and Treatment Manual 5th edition and the Functional Solutions catalog to guide care for the patients. However, the CHT informed the capstone student that the facility is still lacking in appropriate and up-to-date materials and education handouts. They currently have a cabinet in which resources and handouts are stored, but it is unorganized and difficult to find specific information. The information gathered from the interview process signified the need for a capstone student to help create and organize up-to-date, evidence-based materials to help the clinic run more efficiently.

Gap Analysis

Current state

Community Health Network (CHN) Physical Therapy & Rehab is an outpatient therapy clinic located in Noblesville, IN. They offer physical, occupational, neurological, speech, pelvic health, and pediatric therapy. Their hours are Monday-Thursday 7 AM to 6 PM and Friday 7 AM to 5 PM. There are two practicing CHTs who treat a various patient population with primarily orthopedic and mild neurological diagnoses. The capstone site mentor is a CHT that often sees patients with conditions such as arthritis, pain, hand fractures, tendinopathies, tendonitis, nerve compression syndromes (radial, carpal, and cubital tunnel syndrome), and low complexity neurological cases. Common treatments include dynamic stretches, warm-up modalities, tendon loading, soft tissue mobilization, Graston, postoperative splinting, patient education, and exercise programs.

Community Profile

Community Health Network Noblesville serves individuals from both Hamilton and Marion County. Hamilton County's population consists of 85% white, 5.1% black or African American, 7.3% Asian, and 4.9% Hispanic or Latino (“Quick Facts”). 97.2% of individuals from Hamilton County have a high school degree or higher and 60.8% have a bachelor’s degree or higher. Marion County’s population consists of 61.9% white, 30% black or African American, 4.4% Asian, and 11.6% Hispanic or Latino. 87.3% of individuals from Marion County have graduated from high school or higher and 33.2% have a bachelor’s degree or higher (“Quick Facts”).

Desired State

Evidence-based practices are crucial in providing appropriate and safe client-centered care (Connor et al. 2023). The continuous publication of new materials and treatment protocols indicates a need to stay up to date on current evidence to provide the best care. Following the site interview, the CHT demonstrated a need for materials on the most recent evidence for treating patients with arthritis, chronic hand pain, radial and carpal tunnel syndrome, and more. As well, the clinicians wished to have more educational handouts on radial tunnel syndrome, adaptive equipment use, and joint protection for arthritis. They also desired to have a more organized and user-friendly way of storing and accessing handouts and evidence-based materials. Overall, having more accessible and up-to-date evidence will help the CHTs provide more efficient and accurate care to patients.

Identified Gaps

Based on the current state and the desired state of the CHN outpatient clinic, there was a need to have easy access to evidence-based materials to improve the quality of care for patients.

The lack of staffing, time, up-to-date resources, and educational handouts has created a barrier to providing patient care. Having a well-organized and accessible system that consists of accurate information on best treatment practices and informative educational handouts will increase the quality and efficiency of care.

Literature Review

A literature review was conducted to gather evidence on best practices in hand therapy for specific conditions and/or populations. CHN Noblesville clinic would like to have up-to-date evidence-based information on the treatment of radial tunnel syndrome, arthritis, and carpal tunnel. Therefore, the literature review focused on best practices of occupational hand therapy in the treatment of the stated conditions.

Radial Tunnel Syndrome

Radial tunnel syndrome (RTS) is where the posterior interosseous nerve (PIN) becomes compressed within the radial tunnel of the proximal forearm (Levina & Dantuluri 2021). Points of compression can include the tedious edge of the extensor carpi radialis brevis (ECRB) muscle, vessels from the radial recurrent artery, fibrous bands distal to the radial head, and the superficial supinator muscle being the most common. It is the least common nerve compression disorder in the arm and is often misdiagnosed as PIN compression syndrome (Shamrock & Das 2023). RTS presents as dorsal and proximal forearm pain that is characterized as a deep burning and achy sensation. Pain typically increases after performing tasks that require wrist extension and forearm pronation. Tenderness 4 to 5 cm distal to the lateral epicondyle of the elbow is typically present. In addition, patients with RTS can have a loss of functional independence in activities of daily living (ADL) tasks due to decreased ROM, decreased strength, and pain.

Conservative treatment methods to treat RTS are recommended for an extended period before any surgical treatments. Conservative treatments include activity modification, temporary splinting, and anti-inflammatory medications (Shamrock & Das 2023). However, conservative methods are often ineffective and usually require surgical decompression, where the effectiveness ranges from 67% to 92% (Levina & Dantuluri 2021). Hand therapy treatment may include a wrist splint to rest the elbow and wrist, heat and massage to reduce pain, various exercises and stretches, and education on ergonomics and daily modifications. Exercise programs typically include wrist extension, flexion and supination stretches, radial nerve glides, and various strengthening exercises (Levina & Dantuluri 2021).

A recently published case report has shown dry needling to be an effective option in treating nerve compression syndromes. The case reported about a 45-year-old male patient with a 6-month history of RTS that was resistant to other conservative methods, which included medication, injections, massage, exercise, bracing, taping, exercise, electro-physical agents, and manual therapy (Anandkumar, 2018). The patient received 4 dry needling sessions over a 2-week period that involved a grade 6 produce over the supinator muscle. Improvements after one session were noted. As well, after 4 treatments and a 6-month follow-up, the patient was pain-free and had full function of his arm and hand. New evidence suggests that dry needling should be considered a conservative treatment for RTS before resulting in a surgical procedure. However, there is still limited research in the use of dry needling for treating RTS.

Arthritis and Hand Pain

Osteoarthritis (OA) of the hand is a chronic disease with no cure that causes pain and functional limitations (Beasley et al. 2018). It is estimated that 54-67% of adults aged 55 years

or older have hand OA making it the most common type of OA. Osteoarthritis can cause degeneration of articular cartilage, bone thickening, narrowing of joint spaces, changes in periarticular structures, and bone spurs. As the disease progresses, joints can swell and be painful, have increased stiffness, bone-on-bone contact, and joint deformities. Individuals typically present with decreased ROM, strength, and function of the finger joints (Beasley et al. 2018). Osteoarthritis can appear in any part of the hand, especially interphalangeal joints and the carpometacarpal joint of the thumb (CMC1) (Tveter et al. 2020). Osteoarthritis of the CMC1 joint is typically associated with greater pain and limitations than interphalangeal OA. It can be characterized by reduced cartilage, subluxation, increased ligament laxity, and contracture of the thumb web space (Tveter et al. 2020). Individuals with hand OA may have limitations in completing self-care, housework, leisure activities, and work tasks (Beasley et al. 2018). These individuals typically receive hand therapy services to address functional limitations related to deficits caused by the disease.

Hand therapists utilize a variety of evidence-based interventions to treat individuals with OA, such as strengthening exercises, electromagnetic therapy, thermal modalities, orthoses, and patient education. Resistive hand exercises with active range of motion (AROM) and joint protection education have shown improvements in grip strength, increased finger ROM, and decreased pain (Beasley et al. 2018). The use of electromagnetic therapy with hand exercises has demonstrated decreased pain and joint stiffness, and increased function and quality of life. The use of paraffin wax and balneotherapy with and without mud packs has shown to be effective in decreasing joint pain and tenderness, increasing grip and pinch strength, and increasing overall hand function (Beasley et al. 2018). Also, the use of custom proximal and distal interphalangeal (PIP) (DIP) orthoses at night can help decrease joint pain and improve hand function (Beasley et

al. 2018) (Silva et al. 2020). Individuals with CMC1 joint OA who have received education, hand exercises, orthoses, and assistive devices had decreased pain and increased function and strength (Tveter et al. 2020). In conclusion, the following OT interventions are the current standard of care for the treatment of hand OA: electromagnetic therapy, thermal modalities, and orthoses.

Carpal Tunnel Syndrome

Carpal tunnel syndrome (CTS) is a common nerve entrapment disorder of the upper limb. It has a prevalence rate of about 8% of individuals in the working population (Nadar et al. 2023). CTS is caused by the compression of the median nerve in the carpal tunnel region of the wrist. The median nerve can be compressed by the swelling of the tendons that travel through the tunnel caused by repetitive motions, wrist fractures, arthritis, or conditions that result in increased fluid in the body. It results in sensory symptoms in the median nerve disruption area, which includes the thumb, index, middle, and half of the ring finger. Symptoms may include paresthesia, pain, and sensorimotor control deficits, and potentially lead to weakness and muscle atrophy if left untreated. Mild to moderate cases are usually treated conservatively through various therapeutic modalities, however, more severe cases may not respond to conservative methods and require surgery.

One of the most common conservative treatments for CTS involves the fabrication of a custom orthosis or splint. The goal of wearing an orthosis is to maintain the wrist in a neutral position to reduce pressure on the carpal tunnel region (Nadar et al. 2023). The typical fabricated orthosis made for CTS is a wrist immobilization splint that maintains the wrist in 0-5° of extension and has no restrictions on the fingers. However, a recent study conducted by Nadar et

al. (2023) has tested the effectiveness of a wrist immobilization orthosis that also has restrictions on finger movement for treating CTS. It was found that an orthosis that prevented full metacarpophalangeal (MCP) flexion in addition to immobilizing the wrist joint had better outcomes compared to the standard wrist immobilization orthosis used. This is due to the additional blocking of the lumbrical muscles in the hand (Nadar et al. 2023).

In addition to the fabrication of an orthosis, nerve gliding, education, and strengthening exercises are an essential part of treating CTS to help manage symptoms (Hamzeh et al. 2020) (Lewis et al. 2020). A randomized control trial conducted in 2020 studied the effects of therapy on reducing CTS symptoms and the need for surgery (Lewis et al. 2020). The participants who received education, home exercises, splinting, and posture and activity modifications were 21% less likely to proceed to surgery and reported increased satisfaction (Lewis et al. 2020).

Neurodynamic manual therapy and exercises, such as wrist mobilization with combined shoulder movements, median nerve gliding, and stretches, have been shown to reduce pain and increase function in individuals with CTS (Hamzeh et al. 2020). The benefit of using a combination of an orthoses and various exercises emphasizes the importance of a multimodal treatment approach to improve symptoms of CTS.

Modalities such as Kinesio taping (KT) and dry needling (DN) have also been shown to improve symptoms of CTS. Kinesio taping can be applied to aid in muscle contractions or reducing muscle tension, lymphatic and blood flow, joint proprioception, reducing pain, and correcting joint mal-alignment (Aminian-Far et al. 2022). The goal of KT in treating CTS is to reduce the tensile forces produced by the wrist flexor muscles, therefore reducing symptoms. Several studies found that KT can provide short-term relief of symptoms in individuals with mild to moderate CTS (Aminian-Far et al. 2022) (Krause et al. 2020) (Tomás-Escolar et al. 2023).

However, KT was found to be more effective when used in conjunction with other treatments, such as orthotics, manual therapy, and exercises, and should not be used as a stand-alone treatment (Aminian-Far et al. 2022) (Tomás-Escolar et al. 2023). Dry needling is a type of therapeutic treatment where a thin filiform needle is used to penetrate the skin to stimulate myofascial trigger points, connective tissue, and musculature (Rezazadeh et al. 2022). A study conducted by Rezazadeh et al. (2022) found that releasing trigger points found in the abductor pollicis, opponens, and flexor pollicis muscles of the hand through DN techniques resulted in improved CTS symptoms. Individuals had improvements in pinch and grip strength and reduced pain. Though there are several conservative treatment options for CTS, it is best to use a combination of therapies tailored to the individual patient to achieve the best outcomes.

Guiding Model

The Model of Human Occupations (MOHO) was utilized to guide the development of the educational materials. MOHO emphasizes the importance of understanding a patient's motivation (volition), their ability to engage in meaningful activities (occupations), and how they perceive their capabilities (Cole & Tufano, 2020). Upper extremity conditions often involve complex issues like pain, limited ROM, weakness, or altered functional abilities, which can be frustrating and overwhelming for patients. Education plays a crucial role in helping patients understand their condition and how treatment can lead to positive outcomes. By gaining insight into how specific exercises, environmental adaptations, or proper body mechanics can either hinder or support recovery, patients are more likely to feel motivated to adhere to treatment plans and home programs. Additionally, knowledge about how to prevent further injury through proper techniques or adaptations can foster greater self-management of their condition and instill motivation to sustain their progress. Increased understanding of their condition, treatment, and

self-management strategies leads to better adherence, increased confidence, and ultimately, improved occupational performance.

Capstone Project Plan and Process

The doctoral capstone project focused on two areas: (1) update educational materials to represent current best practices and meet health literacy needs of the patient population, and (2) gain clinical knowledge and skills in hand therapy. After completing the needs assessment and literature review, the student created goals and objectives that aligned with the project’s key focus areas and the needs of the clinic, see Table 1. Goals and objectives were approved by the site mentor, faculty mentor, director of research, and capstone coordinator and designed to be achieved at the end of the 14-week experience.

Table 1

Doctoral Capstone Experience Goals and Objectives

Project Goal 1: Create up to date evidence based educational materials on various diagnoses for the staff and client population.	
Objective 1:	The student will collaborate with the clinic to determine specific diagnoses to focus on in creating educational materials.
Objective 2:	The student will create and disperse a survey to similar sites to gain insight on current materials and treatments used.
Objective 3:	The student will combine information from survey results and current literature to create educational materials and trial in the clinic.
Project Goal 2: Ensure education materials meet the healthy literacy needs of the client population	
Objective 1:	The student will determine health literacy assessment or guidelines to use to guide the creation of educational materials.

Objective 2:	The student will use the chosen assessment on each educational material/handout and ensure they meet all standards.
Objective 3:	The student will present/deliver materials to staff members to receive feedback on quality and healthy literacy
Project Goal 3: Gain clinical experience and in-depth knowledge on client education and treatment of various diagnoses.	
Objective 1:	The student will observe various treatment sessions completed by the site mentor and/or other staff.
Objective 2:	The student will learn about common diagnoses seen and the typical treatments used.
Objective 3:	The student will implement learned treatments/interventions and provide education when treating clients.

Evaluation Plan

The evaluation method of the education portion of the capstone project involved the use of a pre- and post-survey, which was distributed before and after the new educational materials were implemented. The student used Qualtrics to create and store the surveys. The survey was sent to the current CHTs at the CHN Noblesville clinic, which includes the site mentor, Holly, and one additional therapist. They were emailed a link to the survey, along with a study information sheet detailing the survey's purpose, potential risks and benefits, and the voluntary nature of participation. Both surveys required the therapist to rank their satisfaction on a Likert scale: 1-strongly disagree to 5- strongly agree. The pre-survey questions focused on the previously used handouts whereas the post-survey questions focused on the newly created handouts. Responses from the pre-survey were then used to guide the development of educational materials to address any concerns or needed changes. The results from the post-

survey were evaluated and compared to the pre-survey at the end of the project to determine overall satisfaction and success of the new educational materials.

Evaluation of the clinical skills portion of the capstone experience were addressed throughout the 14-week period. This was done through weekly meetings between the student and site mentor to provide feedback and discuss the plan for the week. The final evaluation method involved a discussion between the site mentor and student to determine whether the student has met the objective and goals associated with clinical skills.

Capstone Project Implementation

Project Outline and Overview

Multiple components of the capstone project occurred concurrently throughout the 14-week period, see Table 2 for a summary outline. The first two weeks of the capstone experience focused on orienting to the site and refreshing clinic skills. This involved education of clinic policies and procedures, introduction to staff members, review of documentation system, review of manual muscle testing (MMT), ROM, and modalities, and assess current educational materials.

The student began gathering evidence on the treatment of various upper extremity conditions in week 2. The student used journal article databases, such as PubMed and Google Scholar, to find articles that highlighted the most up-to-date evidence. Information gathered was then synthesized and used to update patient educational materials as needed.

A pre- and post-survey were created in Qualtrics in week 5 to evaluate the therapist's satisfaction with the patient educational materials used at the clinic. The pre-survey was distributed in week 4 and post-survey was delivered in week 11. Responses were stored in Qualtrics. Survey questions can be found in Appendix B.

The student worked on creating and updating educational handouts from week 4 to week 7. The student used health literacy guidelines established by the Centers for Disease Control (CDC) to aide in the process of updating handouts (“Guidance and Tools,” 2024). Some changes included the following: increasing size of the font, simplifying language, adding more pictures, adding more exercises, and integrating any new evidence-based practices found. Handouts were distributed to the CHTs in week 8 and 9 for review and any necessary changes were made during this time.

The development of an organizational system for all education and exercise materials was implemented from week 10 to week 12. The student reorganized the file storage cabinet to allow for quicker access to materials. Sections included: conditions/diagnoses, modalities, hand, wrist, elbow/forearm, shoulder, edema, posture/ergonomics, nerve specific exercises, and scar. Each condition folder contained educational handouts and related HEPs. The body part specific folders each contained AROM, PROM, and strengthening exercises. In addition, the student reorganized and added new materials to the handout binder, which stored all original copies.

During weeks 11 and 12, the student scanned all original hard-copy documents to the computer. All new and original documents were uploaded to OneDrive and organized into the same folder names as the file cabinet. The OneDrive folder was shared with the CHTs’ work emails and downloaded to their computer for quick and easy access.

Clinical Skills

Throughout the 14-week capstone experience, the student spent 3 days a week observing and providing patient treatment. The student lead 2-4 patient treatment sessions per day depending on the site mentor’s discretion and patient caseload. The student had opportunities to provide various modalities and manual therapy, such as ultrasound, instrument-assisted soft

tissue mobilization, scar massage, joint mobilization, Kinesio tape, passive ROM (PROM), and therapeutic exercises. In addition, the student fabricated multiple orthoses: wrist immobilization, thumb spica, Muenster, ulnar gutter, hand-based finger extension, finger gutter, hand safe-position, and fingertip protector orthosis. Commonly seen conditions included but were not limited to flexor and extensor tendon repairs; various cases of tendonitis; total reverse shoulder; rotator cuff injuries; wrist and finger fractures and dislocations; conservative and surgical cases of cubital, radial, and carpal tunnel syndrome; arthritis and related procedures; and weakness in relation to neurological conditions; chronic pain; Dupuytren's contracture; mallet finger injury; Trigger finger; edema; and scar adhesions. During any downtime, the student and site mentor practiced the fabrication of orthoses, Kinesio taping, and various manual therapies to enhance learning.

There were several opportunities to observe with the other CHT located at the clinic to enhance overall experience. As well, the student had the privilege of observing hand surgery with a doctor who works at the facility and frequently refers patients to OT. Procedures seen included the following: two proximal phalanx fractures with pinning, Dupuytren's contracture release, two carpal tunnel releases, cubital and ulnar tunnel release, brachial plexus nerve block placement, and distal biceps brachii tendon repair with Endobutton technique. Throughout the experience, the surgeon explained the surgical process for each condition and highlighted key anatomy. Within the following weeks, the student evaluated a few of the patients seen in surgery, which provided a well-rounded experience from start to finish.

Table 2

Outline Summary of Capstone Project

Week #	Objectives/Tasks
Week 1	<ul style="list-style-type: none"> • Orientation to Site
Week 2	<ul style="list-style-type: none"> • Patient treatment observations • Review of Epic documentation system • Review educational materials currently used and how they are organized • Practice MMT and ROM • Review modalities • Begin research
Week 3	<ul style="list-style-type: none"> • Practice fabrication of orthoses
Week 4	<ul style="list-style-type: none"> • 1-2 patients shared treatment • Evaluate new patient • Research/gather evidence on the treatment of upper extremity conditions • Create pre- and post-survey regarding education materials • Send pre-survey to CHTs • Began updating and creating educational handouts
Week 5	<ul style="list-style-type: none"> • Lead 2 patient treatments, assist with other treatments
Week 6	<ul style="list-style-type: none"> • Continue research • Continue to create educational handouts
Week 7	<ul style="list-style-type: none"> • Complete midterm evaluation with site mentor
Week 8	<ul style="list-style-type: none"> • Lead 2-3 patient treatments, assist with other treatments • Observe treatment sessions with other CHT at the clinic • Review educational handouts and begin to distribute to CHTs for review
Week 9	<ul style="list-style-type: none"> • Lead 3 patient treatments, assist with other treatments
Week 10	<ul style="list-style-type: none"> • Observe surgery with hand surgeon • Observe with other CHT to increase exposure
Week 11	<ul style="list-style-type: none"> • Make any needed changes to educational handouts • Organize storage of handouts to increase efficiency • Upload all newly created handouts/files to OneDrive • Demonstrate to CHTs on how to gain access to files and make any future edits for sustainability
Week 12	<ul style="list-style-type: none"> • Lead 3-4 patient treatments, assist with other treatments • Distribute post-survey

Week 13	<ul style="list-style-type: none"> • Complete data analysis of pre- and post-surveys • Finalize capstone project report and prepare for dissemination
Week 14	<ul style="list-style-type: none"> • Complete final review with site mentor

Capstone Project Evaluation

The project educational materials were evaluated through a pre-and post-survey which focused on the therapist's satisfaction of the previously used materials and the new materials. Both surveys consisted of a total of 11 questions, 9 of which were based on a Likert scale and 2 questions were open-ended. The results of the pre-and post-surveys from the two CHTs can be found in Figure 1 and Figure 2, respectively. The topic of each question can be found within the figures and the full questions can be found in Appendix B. Main findings from the pre-survey regarding the previously used educational materials consisted of the following: poor accessibility, concerns with clarity, quality does not support patient education and treatment, mostly includes up to date evidence-based information, home exercises programs (HEPs) are mostly comprehensive and suitable for all patients, time-consuming to use, and overall dissatisfaction with the materials. Responses to the open-ended questions regarding barriers and additional comments include the following: "The drawer is too cramped; the exercises are not easily located."; "The copies are too light to be able to read, some of the handout information is not clear, and some of the handouts need more updated and complete information."; and "lacks the ability to be efficient." The post-survey was distributed after all project materials were completed and delivered. The main findings regarding the new educational materials included the following: easily accessible, clear, easy to understand, quality sufficiently supports patient education and treatment, includes up-to-date evidence-based information, HEPs are comprehensive and suitable for all patients, less time consuming, and overall satisfaction with

the materials. Responses to the open-ended questions regarding what they like about the new materials and any additional comments include the following: “The new materials appear more professional, more legible for the patients, and the diagrams for the exercises also clearly demonstrate what the patient is to do at home.”; “They are updated, clear, and pretty.”; and “Nicole did a fantastic job redoing our home program and exercise sheets, she also organized our filing system and binder system and downloaded the materials so we can access them on our computer.” Results from the post-survey demonstrated significant improvements in the overall satisfaction of new educational handouts and HEPs. The therapists expressed their appreciation of having all original hard copies also accessible on the computer to increase efficiency. Additional comments listed on the student’s final evaluation form include the following: “Her material has been utilized over the last several weeks. It has been very helpful.”; “With improved materials for our patients, the material will maximize the benefits of therapy.”

Clinical skills

Evaluation of the student’s clinical skills occurred throughout the 14 weeks. The site mentor provided verbal feedback after the student treated patients. Written feedback was provided on the student midterm and evaluation forms associated with the school’s OT program. At the end of the capstone experience, the student and site mentor discussed the final evaluation form and determined that the student had met the goals set at the beginning of the experience, which can be found in Table 1. The site mentor’s comments from the final evaluation form included the following: “She did her research while in the clinic, identifying the best evidence-based practice for our patients.”; “She communicated this well (advocating for OT) both with the patients and the OTs.”; “Nicole was always very professional and proficient. Her patients enjoyed her.”; “Nicole asked appropriate questions for each case. She did her research using

many of the resources in the clinic.”; “She was accepting of all that was thrown at her in a busy specialized hand clinic. She adjusted as the demands changed which they do in an outpatient setting. She welcomed all feedback from me and modified the project or patient care as needed. She was kind and compassionate with her patients.” Overall, the student received positive feedback regarding clinical skills and has gained knowledge on treating individuals with various upper extremity conditions.

Figure 1

Pre-survey Results (n=2)

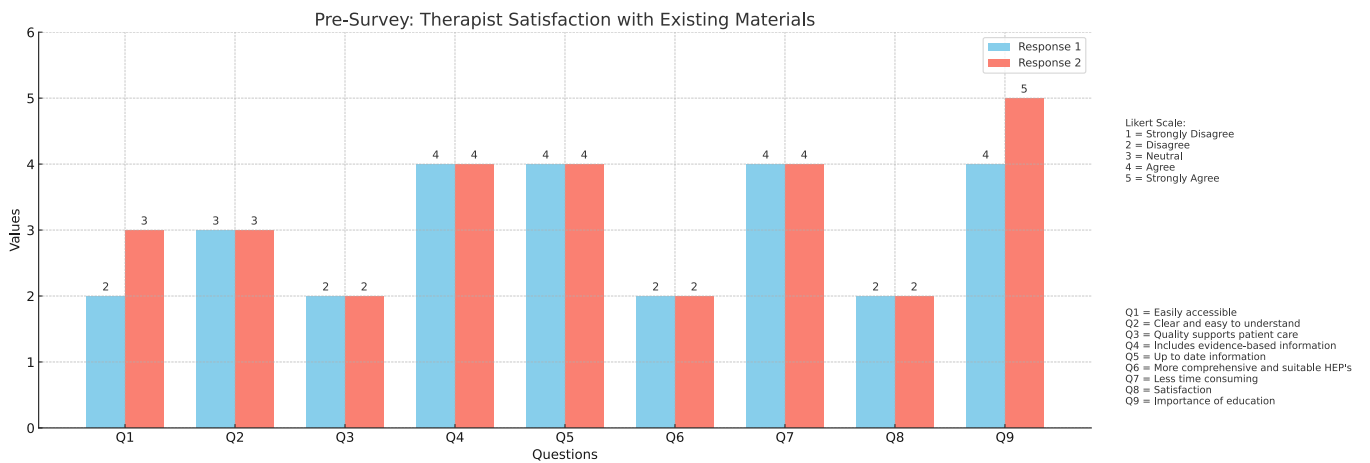
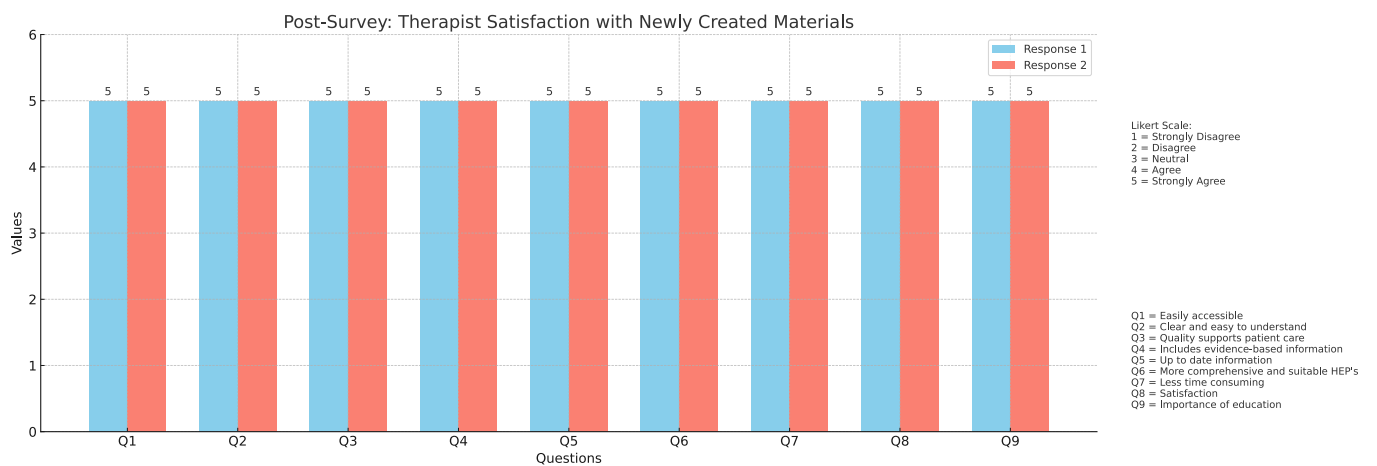


Figure 2

Post-survey Results (n=2)



Capstone Discussion, Impact, and Sustainability

The capstone project aimed to enhance patient care in the outpatient hand therapy setting by creating and updating patient educational handouts and HEPs. Prior to implementing the project, the existing materials previously used were difficult to read, lacked clear instructions and visuals, were missing information, hard to locate, were not easily accessible, and time-consuming to integrate into sessions. The updated materials were designed to improve clarity, address the health literacy needs of the patient population, incorporate evidence-based information, and improve organization and accessibility for the therapists. As a result, patients gained a better understanding of their conditions and the importance of therapy, increasing the likelihood of adherence to home programs- ultimately leading to improved outcomes and greater patient satisfaction (Connor et al. 2023). The hand therapists often manage a high caseload and are required to transition quickly between patients, which emphasizes the importance of maintaining efficiency to uphold work demands. With a better-organized system to store the handouts, the therapists were able to reduce the time spent searching for a specific handout, allowing for more meaningful patient interactions. This led to improved efficiency and enabled the therapists to dedicate more time to delivering patient education.

The original educational materials and HEPs were stored exclusively as hard copies with no digital versions available. Over time, repeated photocopying led to significant degradation in quality, making many of the documents difficult to read. Original hard copies of the materials were stored in a binder where some remained in good condition. To ensure longevity, the student scanned all hard-copy documents onto the computer and uploaded both the updated and original documents onto OneDrive. The file folder was shared with both therapists, and the student assisted them in downloading the files onto their computers for convenient, quick access. In

addition, the student reorganized and added the updated materials to the binder for storage of original hard copies. The new documents were also placed in the file cabinet, with the original copies marked using a yellow marker to distinguish them for photocopying if needed. As a result, all materials can be accessed through three organized routes: digitally on the computer, physically in the file cabinet, or in the binder. This system reduces the risk of misplacing original documents and preserves the quality of all educational materials and HEPs.

Conclusion

The Educational Resources for Upper Extremity Conditions in Occupational Therapy Doctoral Capstone Project has proven to provide significant contributions to the capstone site. The project aimed to enhance patient education and increase accessibility for the therapists working in upper extremity rehabilitation. It resulted in the development of restructured educational handouts and HEPs that were clearer, aligned with health literacy standards, and based on current evidence. Additionally, materials were organized more efficiently for easier access and storage. By utilizing these improved educational resources, occupational therapists are better equipped to support patients' understanding of their conditions and treatments, leading to better outcomes and increased participation in meaningful activities.

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Appendix A

Interview Questions

1. What does a typical treatment session look like?
2. Do you interact with other professions in the same facility? If so, what does that look like?
3. Are there any specific gaps that you have witnessed or experienced with your facility that you would like to be addressed? If so, why are these gaps important to your facility?
4. Are there any specific resources that you use frequently or notice lacking?
5. What are the typical conditions and diagnoses of patients seen at your facility?
6. What will success look like for you with my capstone and how do you envision its sustainability?
7. Would it be possible to focus on clinical skills 2-3 days a week and the other days can be focused on the needs of the facility, such as program or material development?

Appendix B

Pre- and Post- survey Questions

Pre-Survey: Therapist Satisfaction with Existing Materials

Purpose: This survey is designed to assess your satisfaction with the current materials you use to educate patients and guide treatment. The information you provide will help us evaluate the need for improvements and better understand your experiences.

Instructions: Please rate the following statements based on your current experiences with existing materials (e.g., patient education on diagnosis, home exercise programs, and treatment protocols).

Rating Scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

-
1. The current materials I use for patient education are easily accessible (e.g., format, platform, delivery).
 1 2 3 4 5
 2. The current materials are clear and easy to understand for patients.
 1 2 3 4 5
 3. The quality of the current materials is sufficient to support patient education and treatment.
 1 2 3 4 5
 4. The current materials include evidence-based information regarding treatment methods and best practices.
 1 2 3 4 5
 5. The current materials are up to date with the latest research and treatment guidelines.
 1 2 3 4 5
 6. The current home exercise programs are comprehensive and suitable for most patients.
 1 2 3 4 5
 7. I find the current materials time-consuming to use or implement in practice.
 1 2 3 4 5
 8. Overall, I am satisfied with the current materials I use for patient education and treatment planning.
 1 2 3 4 5
 9. Incorporating educational materials into the treatment process is essential for improving patient outcomes and fostering a deeper understanding of care.
 1 2 3 4 5

10. What challenges or barriers have you encountered when using the current educational materials with your patients?

Text entry

11. Do you have any other comments or feedback about the materials?

Text entry

Post-Survey: Therapist Satisfaction with Newly Created Materials

Purpose: This survey evaluates your satisfaction with the newly created materials (e.g., patient education on diagnosis, home exercise programs, and evidence-based treatments). The goal is to compare these materials to the older versions in terms of accessibility, quality, and relevance.

Instructions: Please rate the following statements based on your experience using the newly created materials.

Rating Scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

-
1. The new materials are easily accessible (e.g., format, platform, delivery).
 1 2 3 4 5
 2. The new materials are clear and easy to understand for patients.
 1 2 3 4 5
 3. The quality of the new materials is sufficient to support patient education and treatment.
 1 2 3 4 5
 4. The new materials include evidence-based information regarding treatment methods and best practices.
 1 2 3 4 5
 5. The new materials reflect the most current research and treatment guidelines.
 1 2 3 4 5
 6. The new home exercise programs are more comprehensive and suitable for most patients.
 1 2 3 4 5
 7. The new materials are less time-consuming to retrieve and implement in practice.
 1 2 3 4 5
 8. Overall, I am satisfied with the new materials I use for patient education and treatment planning.
 1 2 3 4 5
 9. Incorporating educational materials into the treatment process is essential for improving patient outcomes and fostering a deeper understanding of care.

1 2 3 4 5

10. What do you like the most about the new materials?

Text entry

11. Do you have any other comments or feedback about the materials?

Text entry