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Culinary Care for Individuals with Distal Radius Fracture to Improve Function in the Kitchen

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Culinary Care for Individuals with Distal Radius Fracture to Improve Function in the Kitchen

by

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We, the undersigned, recommend that the Capstone Final Paper completed by the student listed above, in partial fulfillment of the degree requirements, be accepted by the Georgia State University.

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Abstract

With return to function as the primary goal of occupational hand therapy, it is imperative to create comprehensive and client-centered care that targets functional reengagement. However, the biomedical approach used within hand therapy primarily targets the treatment of body structures rather than the patient's occupational performance. Hand therapy must transcend the mere remediation of the patient's physical impairment or injury and harness creativity and client-centered care to address the performance deficits of each patient.

The purpose of this program was to incorporate occupation-based-interventions (OBI) into a traditional hand therapy clinical program to increase functional improvement and reengagement into the kitchen for individuals with a Distal Radius Fracture (DRF). The main goal of this capstone was to create the Culinary Care program addressing cooking performance deficits and promote safe and pain-free participation in the kitchen with the confidence to independently engage in cooking post DRF.

In this study, we explored the benefits of creating an occupation-based-program, specifically targeting culinary activities, to aid in the recovery of individuals who have sustained a DRF. The creation of this six-week program, Culinary Care, was set into progressive stages in order to match the patient with appropriate challenges in their specific stage of recovery. The various cooking and kitchen activities were strategically matched with that research and my own data proved to be the most challenging for patients with DRF. One person completed the Culinary Care program, and one person participated as a control. Results indicated that the participant in the cooking program exhibited greater improvement across all measures compared to the participant receiving only standard hand therapy. Based on these results, my study indicates that a cooking-based intervention program could potentially lead to greater progress in the recovery from upper extremity injuries while also receiving standard hand therapy care.

Occupation-based interventions used in conjunction with the biomechanical approaches practiced in standard hand therapy show promising effectiveness. The COPM should be utilized in addition to the Disabilities of the Arm, Shoulder and Hand questionnaire (DASH) to measure activity and participation to employ client-centered practice. More scientific evidence regarding the OBI's effectiveness in hand therapy is needed.

Culinary Care will be implemented into Emory Musculoskeletal Institute once I begin my career there as an occupational therapist.

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3. How effective is a culinary program in increasing confidence and understanding in nutrition in patients with distal radius fractures?
4. To what extent are participants satisfied with the 6-week program and its effectiveness on their recovery?
5. How effective is a culinary program in increasing occupational performance and satisfaction based on the COPM as a standardized measure?

My capstone project will investigate the need for occupation-based interventions within the hand therapy sector of occupational therapy. Hand therapy differs from other areas of occupational therapy in that it heavily follows the biomedical approach. This approach to therapy primarily focuses on ways to improve body structures and functions through objective measures, such as range of motion (Robinson, 2016). However, the core of occupational therapy is centered around implementing interventions that are unique to the patient in order to improve the individual's ability to engage in meaningful activities (AOTA). This discontinuity between the current structure of hand therapy and the core of occupational therapy is what my capstone project is targeting.

With return to function as the primary goal of occupational hand therapy, it is imperative to create comprehensive and client-centered care that targets functional reengagement. Hand therapy must transcend the mere remediation of the patient's physical impairment or injury, and harness creativity and client-centered care to address the functional deficits of each patient. An occupation-based approach not only addresses the physical injury of the patient, but also

prioritizes the enhancement of the patient's overall functional capacity. With each patient bringing distinctive challenges and unique occupational priorities to the table, it is imperative that hand therapists balance the scale utilizing the medical model in conjunction with the occupation-based approach in order to increase return to meaningful occupation.

The purpose of this program is to incorporate occupation-based-interventions (OBI) into hand therapy to increase functional improvement and reengagement for individuals with a Distal Radius Fracture (DRF). The main goal of Culinary Care is to promote safe and pain-free participation in the kitchen with the confidence to independently engage in cooking post DRF.

Background:

Distal radius fractures are among the most common orthopedic injuries, with a prevalence of 17.5% compared to other fractures (Candela, et.al, 2022). Individuals who experience a DRF face a variety of functional limitations that result in extreme difficulty with completing everyday tasks. Listed are some of the functional limitations; decreased range of motion (ROM), decreased grip strength, pain and sensitivity, difficulty with fine motor skills, impaired dexterity, decreased functional independence, and difficulty with weight-bearing.

Orthopedic hand therapy is crucial when it comes to restoring wrist and hand function after a DRF. Improving strength, dexterity, range of motion and overall function is the goal of occupational therapy treatment for individuals attending hand therapy. By discharge, patients should not only have increased strength, movement, and dexterity, but most importantly have the ability to complete and participate in pain-free and safe functional activities.

Given that most hand therapists are licensed occupational therapists, it seems expected that the treatment interventions would predominantly be occupation-based. However, treatment interventions in the hand therapy clinic frequently employ a biomedical approach (Malikayil &

Jameson, 2018). This biomedical approach is based in the medical model paradigm, utilizing objective measurements to follow progress of injuries and impairments through therapeutic interventions aiming to enhance range of motion, strength, and overall body structure and function (Malikayil & Jameson, 2018).

Hand therapy is missing the last piece of the puzzle which enables individuals who have sustained a DRF to function at full capacity in order to return to an independent life. In the absence of targeted intervention addressing the specific skill deficiencies exhibited by patients, the ability to achieve optimal functional recovery remains mediocre. This stems from the fundamental principle that engaging in the activity itself represents the most efficacious form of exercise to enhance task completion and proficiency.

Specific Aims:

Over the 14-week capstone experience, I aim to gain a deepened knowledge of the gap that lies within hand therapy rehabilitation and patient's functional reengagement.

I will begin with conducting a literature review on the current state of hand therapy and how it both fulfills and falls short when treating individuals with upper extremity injuries and impairments.

Simultaneously, I will develop a needs assessment from current literature, as well as expert opinions from prior clinical experiences to ascertain the need for greater occupation-based interventions within therapy. Specifically, I will gather knowledge on the greatest functional challenges patients face in the kitchen when recovering from a distal radius fracture.

Integrated findings will be used to develop a six-week occupation-based program targeting physical improvement after injury, as well as safe functional reengagement in the kitchen.

Lastly, the final component of my capstone project will be running the developed occupation-based program, Culinary Care, at Emory Musculoskeletal Institute. After the program is complete, I will take the data and analyze my findings in order to discuss the potential effects that Culinary Care can have on the world of hand therapy.

Methodology

The research design of this project is a randomized control trial. Participants were recruited through convenience sampling. Participants had to be at least 18 years old, sustained a unilateral distal radius fracture, and were receiving hand therapy at Emory Musculoskeletal Institute. The patients will read over a consent form before taking part in the Culinary Care six-week program. The consent form will outline all six weeks with detailed descriptions of their roles, measurements being taken, activities for each session, and surveys to be completed at specified time points.

Outputs:

The outcome I am seeking is the development of an occupation-based cooking program aiming to improve the rehabilitative journey of individuals who have sustained a distal radius fracture. This study emphasizes the critical role that occupation-based interventions play within hand therapy as well as the mere fact that regardless of injury or impairment, every patient brings their own unique set of values, challenges and meaningful occupations to the table. My capstone recognizes that successful rehabilitation is not solely about physical outcomes but also involves fostering confidence and emotional well-being in patients. By prioritizing occupational reengagement, my program, Culinary Care, aims to empower individuals to reclaim their independence, making optimal hand function a catalyst for improved overall well-being.

Significance/Impact:

Unlike traditional hand therapy methods, Culinary Care goes beyond the clinical setting. Culinary care provides patients with engaging and meaningful ways to regain independence and increase confidence in the kitchen after their injury. The fusion of culinary activities and hand exercises not only promotes physical recovery but also targets emotional well-being, emphasizing client-centered care. This research highlights the potential of Culinary Care to transform hand therapy, introducing a new way to provide holistic and client-centered care.

Chapter 1: Literature Review

Background Info

Distal radius fractures (DRF) are among the most common orthopedic injuries, with a prevalence of 17.5% (Candela, et.al, 2022). DRFs are seen primarily in children/adolescents and the elderly; however, the fracture and its recovery process vary between each group. The age groups that experience DRFs most commonly are children under 18 and adults over 50 years old. DRFs most commonly occur from falling on an outstretched arm and results in a fracture of the radius which makes up one of the two long bones of the forearm. Recovery time from a DRF can vary from person to person; however, the general timeline is about three months before return to light activities of daily living (ADLs) and one year for a full recovery (Pidgeon, 2010).

Individuals who experience a DRF face a variety of functional limitations that result in extreme difficulty with completing everyday tasks. Some of the physical limitations and impairments include: decreased range of motion (ROM), decreased grip strength, pain and sensitivity, difficulty with fine motor skills, impaired dexterity, decreased functional independence, and difficulty with weight-bearing. With an overall increasing incidence of DRFs each year worldwide, there is a fast-growing interest in examining and researching more innovative approaches to treatment options (Corsino, 2023).

This paper will review the current state of hand therapy for DRFs, highlight both the clinical and literature gaps regarding occupation-based-interventions for DRFs, and lastly, provide a new and innovative way to increase functional outcomes.

Current Treatment for a Distal Radius Fracture

The current hand therapy treatment of a DRF is detailed within a specific timeline, clarifying exactly what is to be done weekly. The exact approach to treatment varies slightly depending on whether the patient went a surgical or non-surgical route after injury. The treatment outline illustrated in *table 1* and *2* below is the Indiana Hand Protocol for non-surgical and surgical treatment of a DRF and it is widely used by hand therapists.

Table 1: Indiana Hand Protocol (Cannon, 2020, p.290-295)

Nonsurgical Timeline	Treatment Description
5-6 weeks	Once the fracture is determined to be clinically healed, the orthosis is removed and can be worn part-time to protect the fracture. Edema control is continued using KT tape, an elastic stockinette, and Manual Edema Massage. AROM exercises can be started to the forearm and wrist and home exercises should be done +/- 4 times a day.
7 weeks	AAROM exercises are initiated with the emphasis on forearm supination/pronation and wrist ROM. Wrist orthosis can be removed for ADLs and kept off around the house. Hand strengthening can begin with hand exercisers and putty; however, pain and edema must remain at a low level throughout.
8 weeks	Orthosis usage is decreased. The main goal at this point of recovery is a functional arc of motion without pain.
9 weeks	Wrist strengthening continues at a low level with ability to use 1–3 lb weights assuming pain stays manageable.
10 weeks	Wrist orthosis is only used when lifting heavy objects. Strengthening continued to increase.
12 weeks	Patients can now return to bilateral lifting of around 25 lbs. and return to most occupations. Functional activities that require a tight grip against resistance should be avoided until the 4-month mark.

Table 2: Indiana Hand Protocol (Cannon, 2020, p.290-295)

Surgical Timeline	Treatment
4 weeks	weighted wrist stretches can begin with a 1-3lb. weight. The wrist orthosis can be removed for light ADLs and activities around the house.
5-6 weeks	The wrist orthosis wearing time gradually decreased. Hand strengthening can begin with hand exercisers and putty; however, pain and edema must remain at a lower level. To increase ROM, joint mobilization can gently be performed.
6-8 weeks	Strengthening of the wrist can begin with handheld weights of 1-2lbs to start. The weight can gradually increase to a 4-5 lb weight over the next 3-4 weeks. Strengthening for pronation and supination is initiated as well as isometric exercises.
8-10 weeks	The wrist orthosis is discontinued, and the patient may begin ADLs that avoid heavy lifting of over 10 lbs. with the affected hand.
10-12 weeks	The patient may return to all ADLs; however, it is recommended that the patient wait about 4 months before initiating heavy manual labor or activities requiring a tight sustained grasp.

Thus far, conservative treatment methods such as splinting and strengthening exercises have been employed for DRFs in the hand therapy clinic. However, these techniques are targeting specific outcome measures that lie within a small and confined management landscape that limit the ability to address functional outcomes. With the focus of occupational therapy being achieving the most optimal functional outcomes, hand therapy must progress to shift to align with this vital goal for patients seeking hand therapy. A paradigm shift towards more individualistic and client-centered treatment requires innovation and creativity amongst therapists within the hand therapy clinic.

Occupation-Based Interventions in Other OT Settings

There have been various studies completed outside of the scope of hand therapy demonstrating the effectiveness of occupation-based-interventions (OBI). In a longitudinal observational cohort study including 30 participants within a general inpatient rehabilitation ward, OBIs were utilized to improve general ADL function, self-efficacy, and general goal attainment using the COPM (Spalding et al., 2022). A statistically significant increase in post-intervention scores were found on all measures with the occupation-based group, showing how the client-centered interventions improved the patient's everyday functioning within their unique environment (Spalding et al., 2022). Furthermore, a randomized control trial by Skubik-Peplaski et al. (2017), utilized OBIs and repetitive task practice to explore the recovery of occupational performance among stroke survivors. The outcomes revealed that OBIs were just as effective as repetitive task practice and improved both the motor performance in the affected upper extremity as well as their satisfaction in occupational performance (Skubik-Peplaski et al., 2017). These studies show that OBIs might be effective across various settings and disciplines.

Existing Hand Therapy Articles Using OBIs

There has been a much narrower scope of research done on the effect of OBIs within the hand therapy setting. However, the literature that currently exists shows positive implications for the use of OBIs as part of rehabilitation for individuals with an upper extremity injury. In a systematic review of OBI benefits within the hand therapy environment (Weinstock-Zlotnick & Mehta, 2019), all the reviewed studies, including case reports, except for one, indicated favorable outcomes following OBIs. Regarding outcome measures, participants in the OBI groups demonstrated significantly superior improvements in the performance scale of the COPM

compared to the control group (Weinstock-Zlotnick & Mehta, 2019). Additionally, the Jebson Taylor Hand Function Test, which assesses hand functions such as dexterity and coordination, showed significant improvements with patients who were engaging in the OBIs (Weinstock-Zlotnick & Mehta, 2019).

Furthermore, in a randomized control trial (RCT) by Che Daud et al., (2016) it was determined that a mix of occupation-based interventions with therapeutic exercise resulted in a better recovery compared to just therapeutic exercise alone for the treatment of hand injuries. The group who had OBIs with the therapeutic exercises in this study showed significant improvement in performance and satisfaction in the COPM after their therapy was done (Che Daud et al., 2016). The analysis done in this RCT confirmed that the mix of OBI and therapeutic treatment for individuals, regardless of age, type of hand injury, or cause of injury, produced greater improvements in range of motion, mean scores of grip strength, pinch strength, pain and dexterity (Che Daud et al., 2016). This study really exemplifies the importance of utilizing the OBI approach in conjunction with the biomedical approach.

Gap in Literature

Literature continuously illustrates how there is an essential need for further exploration of OBIs within the hand therapy sector. A systematic review regarding the effectiveness of occupational therapy interventions for adults with orthopedic conditions highlights how the evaluation and outcomes of occupation-based interventions are greatly lacking (Roll, 2017). Throughout this systematic review of 59 studies, only one study demonstrated an intervention that would be categorized as an OBI, other than education for patients regarding joint protection and energy conservation (Roll, 2017). In addition to the lack of OBIs used, this study displays a

lack of knowledge in research on interventions that directly address functional outcomes. All the studies in this article used measures such as ROM, grip strength, and patient reports as the primary outcome. However, none of the studies utilized occupation-based outcomes, further showing a gap in literature regarding the evaluation of OBIs. In another systematic review looking at the functional outcome measures being used globally, it was reported that the most used measures were ROM, grip strength and the Disabilities of the Arm, Shoulder and Hand Questionnaire (Norton, Bugden & Liu, 2022). This research concluded that there is a substantial lack of occupation-based functional outcome measures within the orthopedic sector of occupational therapy.

Clinical Gap

The current gap lies within the tight box that hand therapy exists in. Hand therapy differs from other areas of occupational therapy in that it heavily follows the biomedical approach. This approach to therapy primarily focuses on ways to improve body structures and functions through objective measures, such as range of motion (Robinson, 2016). The core of occupational therapy is centered around implementing interventions that are unique to the patient in order to improve the individual's ability to engage in meaningful activities (AOTA). This discontinuity between the current structure of hand therapy and the core of occupational therapy is what must be addressed. Certified hand therapists treating patients with acute and chronic injuries need to evaluate the challenges and barriers that impede that individual's ability to engage in meaningful occupations. In doing so, certified hand therapists (CHTs) can develop OBIs to decrease those obstacles and help improve the patient's ability to participate in their everyday occupations. While many CHTs acknowledge the importance of OBIs and client-centered practice, few are actively utilizing and practicing this approach with their patients (Robinson, 2016). According to

an article written by Robinson (2016, p.293-296) in the *Australian Occupational Therapy Journal*, the "commonly cited reasons are lack of time, cost containment measures, reliance on protocols and a lack of understanding of occupation-based interventions". These reasons may pose obstacles to implementation of OBIs in the clinic; however, they do not excuse the overall lack of occupation-based practice currently in place.

Occupation-Based Measures

In order to prioritize functional outcomes and enhance patient care, hand therapy clinics must utilize a tool that measures client-perceived changes due to their injury regarding occupational performance. Research has shown that bodily functions are not the direct limiting factor relating to functional improvement (van de Ven, 2015). This means that an individual's physical improvement is separate from their ability to re-engage in their personal occupations. It has been shown that questionnaires on activity limitations are insufficiently related to the objective measures commonly used to track progress (van de Ven et al., 2015). Van de Ven goes on to say, that it's widely understood that bodily functions aren't directly linked to functional activities, in part because most functional tasks can be completed with a relatively small percentage of the hand's active range of motion (AROM). (2015). Evidence reported by Michener et al., in his study examining the relationship between grip strength and functional outcomes, shows that recovery of grip strength predicts only 37% of daily activity performance (2001). Van de Ven et al. additionally demonstrates with his research that there were low correlations between subjective measurements tools and objective measurement tools when assessing hand impairments (2015). This research concludes that there is a necessity to address occupational limitations as well as physical impairments, such as grip strength, pain and range of motion (2015).

The COPM is a client-centered outcome measure that is designed to focus directly on occupational performance and satisfaction (*Psychometric Properties of the COPM,* 2022). The COPM is a standardized assessment administered as a semi-structured interview between the therapist and the patient. The patient rates their performance and satisfaction in each specific activity listed with an overall score out of 10; one representing poor performance and satisfaction and 10 being optimal. The scores from this assessment can allow the therapist to better understand the patient's priorities and create meaningful goals throughout therapy. Traditionally, successful clinical outcomes for patients with a DRF have been based on wrist ROM and grip strength. However, as clinicians providing occupational therapy, it is imperative to bring focus to what patients are most interested in: the ability to engage in functional activities (Ikpeze et al., 2016). As Ikpeze states so eloquently in his research on distal radius fractures and rehab, bridging this clinical gap means shifting "to the psychosocial effects of injury, leading to the development of patient-rated outcome measurement systems" (2016).

According to a research report on construct validity of the Canadian Occupational Performance Measure (2015), the COPM provides client-specific information that is not given in standardized measures such as the DASH and MHQ. The COPM incorporates important activities that are not included with either the DASH or MHQ that are vital in identifying activity limitations for upper extremity injuries (ex: shaking hands, tying shoelaces). The DASH and MHQ both aim to gather information regarding functional deficits; however, they do so with predefined activity limitations, which doesn't allow for an individual to add an activity or deem an existing one unimportant (van de Ven, 2015). According to Ven Stevens, et al., the large range of problems identified using the COPM verifies the idea that values related to occupational performance vary greatly depending on the cultural, physical, and social environment of each

person (van de Ven, 2015). Therefore, administering a self-report measure to patients with predefined activities, such as the DASH and MHQ, defeats the purpose of identifying each individual's unique functional limitations. Since the COPM is based on individuals' values, perspectives, judgements and preferences relating to their functional performance, it can enable both the monitoring of occupational progress as well as clinical decision making. Patients can remain engaged in problem solving and goal setting to increase comprehensive, client-centered, and patient-tailored interventions (van de Ven, 2015).

As it is very difficult to create a questionnaire that addresses every occupational challenge for each individual and culture, it is vital to utilize open-ended interviews such as the COPM, in addition to the standardized measures in place such as the DASH and MHQ. Open-ended interviews allow patients to go beyond checking a box or rating the difficulty of a broad list of activities already provided. A person-centered treatment program can only be achieved with measures that allow the individual to provide their unique experiences and challenges openly and in detail.

Culinary Care Components

Orthopedic hand therapy is crucial when it comes to restoring wrist and hand function after a DRF. Improving strength, dexterity, range of motion and overall function is the goal of occupational therapy treatment for individuals attending hand therapy. By discharge, patients should not only have increased strength, movement, and dexterity, but most importantly have the ability to complete and participate in pain-free and safe functional activities. However, from my clinical experiences, discussions with occupational therapy clinicians and patients, as well as extensive research, it is clear that the current state of hand therapy in orthopedic clinics is falling short in their ability to help patients achieve full participation back into certain ADLs and

IADLs. It is imperative to acknowledge that "functional hand use is a large component of the human identity, because hands are a person's interface with the world (Kielhofner, 2014). As such, musculoskeletal disorders of the forearm, wrist, and hand pose a particularly formidable obstacle to everyday functioning. (Roll, & Hardison, 2017.). Hand therapy is missing the last piece of the puzzle which enables individuals who have sustained a DRF to function at full capacity in order to return to an independent life. Without specifically working on the skills that patients are struggling with, the gap between physical recovery and successful occupational reengagement will continue to exist. Activities in the clinic to improve strength, range of motion and dexterity such as using putty, the power bar, flex bar, power gripper, squishy balls, and TheraBands are great for overall hand use. However, these tools do not have the full ability to mimic an actual functional task.

Culinary Care is an OBI program created to enhance patient care and increase functional recovery, specifically in the kitchen. OBIs involve utilizing meaningful occupations tailored to the client's needs, interests, health and involvement in daily life (Khayatzadeh et al., 2015). Cooking is a crucial part of living an independent and healthy life. Every human must eat and drink in order to sustain life and function daily. Therefore, cooking is one of the most important occupations a person can do. Cooking requires the use of both hands in addition to the ability to exercise simple and complex fine and gross motor skills. Activities in the kitchen include but are not limited to: cutting, peeling, stirring, pouring, squeezing, twisting, kneading, pinching, shaking etc. With unaffected wrists and hands, these tasks may seem second nature. However, for an individual who has sustained a DRF, these tasks can be extremely difficult. Culinary Care will target the outcomes being measured in a hand therapy clinic, but with the added component of functional improvement in the kitchen.

In this study, we explore the benefits of creating an occupation-based-program, specifically targeting culinary activities, to aid in the recovery of individuals who have sustained a DRF. This program is carefully designed to address the unique needs and goals of patients and tailor the therapeutic interventions to directly translate to their occupational success. There are a variety of reasons why addressing kitchen and culinary skills for patients with a DRF is extremely prudent and necessary for physical, mental and emotional well-being. Preparing a meal requires various fine and gross motor skills of the hands and wrist such as cutting, stirring, peeling and lifting. These activities along with many more encountered in the kitchen can serve as therapeutic exercises for a patient's hand and wrist. These exercises can help regain strength, coordination, dexterity, and ROM in the affected hand. As the tasks increase in intensity and complexity, improvement will gradually increase as well. Whether an individual has a passion for cooking, or solely engages in it out of necessity, the skills to fulfill culinary activities require precise hand movements. Just as patients recovering from a DRF do in therapy with TheraBands, squishy balls, thera-puddy, etc., engaging in functional tasks such as peeling vegetables or kneading dough can address those same outcomes such as strength and dexterity.

Furthermore, this study aims to address the patient's psychological well-being during therapeutic recovery. Whether an individual expresses a love for cooking or simply engages in it out of necessity, acknowledging the importance of autonomy in this area of function is crucial. For an individual that has a passion for cooking, learning to re-engage in kitchen activities after a DRF can provide a sense of enjoyment and excitement throughout a more stressful and painful period of time. Creating meaningful goals towards a cherished activity can increase motivation and allow the patient to become more involved in their own recovery. Working towards these goals can provide a sense of accomplishment and pride, specifically in an occupation that is

relevant and purposeful. For an individual that spends time in the kitchen solely to put food on the table for themselves or their family, having an injury that impedes on such an important activity can significantly decrease autonomy, self-esteem, and create a feeling of helplessness. Incorporating culinary activities into recovery enables these patients to directly target a deficit that may impact their life in a negative way. Additionally, addressing safety in the kitchen with a DRF is vital so that individuals can prevent further injury and maintain confidence during such activities. Depending on the severity of the injury, there may be a need to use adaptive tools or modify certain cooking techniques to best accommodate the injury. Culinary Care will provide all the necessary adaptive equipment to engage in cooking such as a rocker knife, silicone jar grippers, adaptive cutting boards, choppers, etc. This will enable each participant to safely engage in the activity, with the necessary modifications for their specific point of recovery.

The last aspect of Culinary Care is the nutrition component. Nutrition plays a massive role in physical recovery from an injury, yet nutritional education is rarely included in the therapeutic process. Culinary Care aims to give patients proper knowledge on how they can further contribute to their own successful recovery from a DRF through the foods they choose to put in their body. A clinical review analyzing the current literature reviewing the correlation between nutrition and orthopedic sports medicine injuries, shares evidence that malnutrition is highly common among orthopedic patients (Choi, 2021). Furthermore, this article emphasizes how clinicians must increase their awareness of the potential role that nutrition plays on treatment and performance outcomes, especially since very few studies exist on the various implications that malnutrition can have on orthopedic injuries and procedures (Choi, 2021).

Scope of Occupational Therapy

This need I am trying to address falls directly in the domain of occupational therapy practice concerns because occupational therapy is based on function. According to the AOTA, the purpose of occupational therapy is to "promote health, well-being, and your ability to participate in the important activities in your life" (What is OT, 2023). Cooking is one of the most important activities an individual can participate in because every human must eat. Cooking promotes independence and healthy eating habits which can directly impact the recovery process of an injury. However, when an individual sustains a DRF, cooking becomes one of the hardest functional activities to return to due to the fine and gross motor skills required to successfully participate in it. A research article addressing the effects of occupation-based occupational therapy (OT) on older adults and their occupational performance clearly stated that "older adults' occupational performance can be significantly improved through low-intensity occupation-focused and OBI. It is recommended to develop and test high-intensity OT programs and maintenance programs" (Nielsen, 2017). The major gap I have seen throughout research and my own clinical experiences is that there is a lack OBIs incorporated into hand therapy. This leads to patients being discharged with continued occupational struggles and decreased functional engagement in meaningful activities.

Distal radius fractures are one of the most common diagnoses that Emory Musculoskeletal Institute sees for hand therapy, and the struggles that these individuals face are all very similar. Returning to specific functional tasks that require a variety of fine and gross motor skills of the fingers and wrist, specifically cooking, remains a major obstacle. Therefore, adding this component to hand therapy would greatly benefit patients' return to activities in the kitchen.

Specific Aims

Over the 14-week capstone experience, I aim to gain a deepened knowledge of the gap that lies within hand therapy rehabilitation and patient's functional reengagement.

I will begin with conducting a literature review on the current state of hand therapy and how it both fulfills and falls short when treating individuals with upper extremity injuries and impairments.

Simultaneously, I will develop a needs assessment from current literature, as well as expert opinions from prior clinical experiences to ascertain the need for greater OBI within therapy. Specifically, I will gather knowledge on the greatest functional challenges patients face in the kitchen when recovering from a distal radius fracture.

Integrated findings will be used to develop a six-week occupation-based program targeting physical improvement after injury, as well as safe functional reengagement in the kitchen.

Research Questions

1. How effective is a culinary program in increasing ROM, strength, dexterity, and edema in patients with distal radius fractures?
2. How effective is a culinary program in improving functional reengagement in cooking, kitchen safety and confidence in patients with distal radius fractures?
3. How effective is a culinary program in increasing confidence and understanding in nutrition in patients with distal radius fractures?
4. To what extent are participants satisfied with the 6-week program and its effectiveness on their recovery?

5. How effective is a culinary program in increasing occupational performance and satisfaction based on the COPM as a standardized measure?

CHAPTER 2: Needs Assessment

In order to have a clear understanding of where the needs lay for both the occupational therapists and the patients, it was necessary to have crucial questions answered prior to creating this program. Luckily, as I began brainstorming for this research project as a whole, I was in the midst of my level two clinical rotation at Emory Musculoskeletal Institute. For 12 weeks, I worked in hand therapy, learning the ins and outs of upper extremity impairments and the therapy that came with it. Throughout my rotation, I made it a point to have intentional conversations with patients regarding the functional challenges that came along with their injuries. With each conversation came greater insight into a clear gap that exists between hand therapy and functional reengagement after injury. From this realization came the idea to create greater specificity with my questions in order to find out what functional challenges were greatest with select hand injuries, in addition to the constraints of the therapist to meet these functional goals with their patients.

The information I gathered told me some key points which ultimately sparked this research. Below are the takeaways:

- Distal radius fractures were the most common injury that came into the clinic.
- Hand therapy helps patients regain many physical deficits back, however, the movements in therapy did not always translate to the functional deficits experienced in each patient's unique life.
- The most challenging activity patient's experienced with a wrist fracture across the board was cooking.
- More specifically, cutting was expressed as one of the more difficult cooking tasks.

- Due to the skills required to complete cooking and kitchen activities, patients who had wrist fractures often resorted to eating out because of the overall difficulty of the kitchen tasks.

Therapists

- Hand therapists shared that including OBIs into therapy is extremely important for patients' functional reengagement. They also reported that they are aware of the gap between the core of OT and the state of hand therapy.
- The therapists expressed the various barriers with implementing more unique OBIs into the clinic: time, money, insurance, and overall setup in the clinic.
- One of the main occupations that present the most challenges post injury mentioned by patients was cooking. Some examples the therapists heard most were opening jars and cutting.

CHAPTER 3: Capstone Plan and Process

Site Description:

Emory Musculoskeletal Institute provides therapy for individuals with orthopedic injuries and impairments. More specifically, the occupational therapists provide therapy for individuals with upper extremity injuries or impairments. The occupational therapists are board certified specialists in orthopedics with a certification in hand therapy as well. The current standard hand therapy consists of upper limb rehabilitation from time of injury and/or time of surgery until recovery. Other than the standard therapy, there are no other programs for patients to engage in OBIs..

Process Used for Developing the Program:

When developing Culinary Care, there were a variety of resources utilized throughout the process. I began by conducting extensive research on the current state of hand therapy in order to best identify the problem and articulate the large clinical gap that exists. The research then pivoted to how OBIs are employed in other areas of OT and how they enhance rehabilitation amongst various other rehabilitation settings. Lastly, I sought out any existing literature on OBIs or programs that are conducted within the orthopedic hand therapy setting. It was at this stage that the research emphasized the lack of client-centered occupation-based care and the major need for more holistic care, where the biomedical approach is fused with the occupation-based approach to provide therapy.

Additionally, I pulled from various testimonials from past patients who were attending hand therapy after a distal radius fracture. The underlying theme was that despite the improvements obtained from hand therapy services, patients expressed continuous functional

challenges in their everyday lives. This revealed that regardless of clinical improvements being made through objective measurements, there were still baseline functional obstacles that patient's faced requiring further interventions. After this information was collected, further discussions were had with my site mentor, Marcia Toye-Vego OTR/L CHT. I gained a deeper understanding of how sessions are structured, what works, what is lacking, and what she believes would be beneficial for patients in recovery.

Lastly, I enrolled in a functional nutrition course to broaden my knowledge of how nutrition impacts physical health and in turn helps or hinders orthopedic recovery post injury. To best prepare for the inclusion of nutritional education in this program, I took a 19-hour course called *Using Food as Medicine for Optimizing Health & Wellness.* This course provided me with the proper knowledge regarding the role of nutrition on our health, and how we as individuals can readjust our nutritional habits to best support healing and rehabilitation. I chose to gather the information I deemed most important in relation to orthopedic recovery and consolidate into six weekly power points to share in this program. Topics covered throughout the six weeks included the power of nutrition, inflammatory and anti-inflammatory foods, processed foods, fats and carbs, and cooking in vs takeout. The goal of sharing this information each week was to not only educate the participants about healthier nutritional choices to improve recovery, but also empower them to prioritize nutrition and see it as a therapeutic aid that they have control of.

Lastly, each week's recipes were chosen to not only target physical recovery, but to also serve as an example of healthy options to utilize in their own kitchens. The ingredients used in each recipe were carefully and intentionally picked to follow the nutritional material being presented and instill confidence in the participants that cooking healthy and nutritious meals can be low maintenance and enjoyable despite their injury.

Methodology:

There were two groups in this research project: the control group and the experimental group. The control group received conventional hand therapy for six weeks as per their normal rehabilitation schedule at Emory. The experimental group received conventional hand therapy for six weeks at Emory; however, they also participated in a six-week culinary program in addition to hand therapy during those six weeks. Both groups had measurements collected at the same time points (week one and week six), as well as completed the COPM and two surveys at week one and week six. All hand therapy provided by the certified hand therapist which will be the same for all participants while the student researcher ran the culinary program for the experimental group. Culinary Care was structured into progressive stages, starting with basic tasks and gradually increasing complexity to more advanced culinary challenges. Each week was designed to build upon the previous week's skills, ensuring a safe, gradual and fun progression in hand function recovery.

Culinary Care was run a total of six weeks with sessions once a week for 1.5 hours each. Weekly sessions took place in the evening at Emory Ortho and Spine where the hand therapy also took place. Each session consisted of the same overall plan with the only changes being the recipes made and the nutritional information given out. Each recipe was specifically picked to work on activities that were difficult due to the DRF but in a safe and engaging manner. Adaptive equipment was available at each session so that every individual's needs could be met depending on where they were at in their recovery process.

Recruitment

When attending Emory for the patient's therapy session, they were be asked if they wanted to participate in the study using a recruitment script. The student PI gave out the consent

form to patients once they have verbally expressed interest. Once there was a total of five volunteers, names were be pulled out of a hat, randomly assigning them to either the control group or the experimental group.

Participants

- n=1 control group
- n=1 experimental group
- Inclusion
  - Must speak English fluently
  - Must have sustained a Distal Radius Fracture
  - Must be a unilateral injury
  - Must be within 6-8 weeks post injury/surgery to start the six-week culinary portion.
- Exclusion
  - Cannot have multiple upper extremity injuries.
  - Cannot be receiving therapy from anyone but Marcia Toye-Vego at Emory Musculoskeletal Institute

Intervention

Each session consisted of the same overall plan with the only changes being the recipe made and the nutritional information given out. Each recipe was specifically picked to work on activities that were difficult due to the DRF but in a safe and engaging manner. Adaptive equipment was made available at each session so that every individual's needs could be met depending on where they were at in their recovery process.

As stated above, each week, the hour and a half session consisted of the same outlined scheduled:

- 10 min: Introduction to the week
- 10 min: Measurements taken (weeks one and six)
- 5 min: Hand out materials and ingredients
- 5 min: Overview of recipe and the why
- 10 min: Nutritional education
- 50 min: Cooking the scheduled recipe.
- TOTAL TIME: 90 minutes

Assessment

Both groups had the standard clinical measurements already used at Emory for patients, which was taken at week one and week six. These included:

- Goniometry: Measuring range of motion of both wrists and fingers
- Dynamometry: Measuring strength of both hands
- Circumferential: Measuring edema/swelling of both wrists and hands
- 9-hole peg test: Measuring dexterity of both hands
- Quick DASH: Measuring ability to perform specific activities: 11 statements with five possible rating responses .

In addition, the following measures for this specific research program were be taken at week one and at week six: (Appendix 3)

- COPM: A self-report measure of importance, performance, and satisfaction for a variety of occupations/activities of daily living.
- Nutrition Survey

    - This survey has eight statements about perceived understanding regarding the effects of nutrition on physical recovery and how their injury has impacted their nutrition. The survey statements had a 4-point rating scale with 1=Totally Disagree and 4=Totally Agree with their perception of kitchen confidence and safety. Agreement indicates a negative response and disagreement indicates a positive response.
- Kitchen confidence and Safety Survey
    - This survey has 10 statements about perceived safety and confidence in performing kitchen tasks. The survey statements had a 4-point rating scale with 1=Totally Disagree and 4=Totally Agree with their perception of kitchen confidence and safety. Agreement indicates a negative response and disagreement indicates a positive response.
- Program Satisfaction Questionnaire
    - This survey has 9 statements regarding overall satisfaction with the program. Each statement is to be rated using five possible response options. The scale ranges from 1= not at all satisfied to 5= extremely satisfied.

Weekly sessions took place on Tuesday evening at 6pm in a conference room at Emory Orthopedics and Spine Center (where normal hand therapy takes place). Each week, there was a breakdown of the schedule for that individual session including education presented, recipes, specific activities performed and reasoning behind the week's goals.

This 6-week culinary program was run in conjunction with weekly hand therapy in order to translate the skills and progress done in the clinic, to the kitchen. The primary goal of this program was to promote safe and pain-free participation in the kitchen with the confidence to

independently engage in cooking post-DRF. Patients were recruited to participate in this program through Emory Orthopedic and Spine Center. Patients must have sustained a unilateral DRF in order to participate in this program. The length of this research project spanned a total of six weeks. There were two groups, a control group and an experimental group, and data was recorded at the same time for everyone. Both groups started hand therapy post injury/surgery and continued their normal weekly appointments for six weeks. The experimental group took part in a six-week culinary program in addition to their hand therapy, while the control group received their conventional hand therapy as they normally would.

CHAPTER 4: Results

Recruitment occurred in January of 2024 and data were collected in February and March of 2024. A total of five participants fit the inclusion criterion within the given timeline. Three people were in experimental and two were in control groups. However, after consent forms were signed participants were randomly assigned into groups, two individuals within the experimental group dropped out due to change in therapy location and one individual in the control group terminated communication altogether.

Participant one (experimental) was a 60-year-old Caucasian woman and participant two (control) was a 73-year-old Caucasian woman.

n=1 experimental group

n=1 control group

Research Q1 *Physical Outcome Measures*

Participant One

Out of 18 ROM measures, participant one (experimental) showed an increase in 13/18 (72%) ROM measurements, a decrease in 1/18 (5.5%) ROM measurements and 4/18 (22%) measurements that stayed the same. See Table 3 for details. This major improvement indicates that the six-week Culinary Care program potentially enabled an increase in ROM for the majority of the hand and wrist. Regarding grip strength, there was a 14 degree increase in the left (injured) and a 15 degree increase in the right (uninjured hand). This shows that both hands gained significant improvements in gross grip strength after the six-week program, with left (44lbs) and right (90lbs) hands being within the normal range for strength. Additionally, participant one posted a faster time in the 9-hole peg test with their left hand (injured) improving by 1.38 seconds and right hand improving by 0.60 seconds. This shows an increase in overall

dexterity for both hands after participating in Culinary Care. Lastly, participant one's left wrist decreased in edema by 0.4cm while their right wrist increased by 0.3cm after week six.

Participant Two

Participant two (control) showed an increase in 12/18 (66.6%) ROM measurements and a decrease in 6/18 (33.3%) ROM measurements. The measurements that showed a decrease in range of degrees were supination, pronation, ulnar deviation, radial deviation, DIP index finger, and DIP ring finger. Additionally, wrist flexion and wrist extension ROM measurements only improved by five and two degrees from week one to week six, demonstrating an insignificant change in range of improvement. Regarding grip strength, there was a seven degree increase in the left (injured) hand but no change in the right (uninjured) hand. Additionally, participant two posted a faster time in the 9-hole peg test with their left hand (injured) improving by 1.38 seconds but had a slower time in the right hand (uninjured) by 1.65 seconds. This indicates that their left-hand dexterity increased over the six-week period of hand therapy, but their right hand regressed. Lastly, participant two's left wrist decreased in edema by 0.4cm and their right hand decreased by 0.2 cm after week six.

Comparison

Results indicate that participant one showed greater improvement in total number of objective measurements with a sum of 18/24 (75%) compared to the control group with a sum of 14/24 (58%) (see *table 3*). Participant one had an increase of 14 lbs. of grip strength after the six-week cooking program, while participant two had an increase of only 7 lbs. This indicates that participant one who completed Culinary Care, showed greater ROM and strength compared to participant two who strictly attended hand therapy for the six-weeks. Regarding the 9-hole peg test, both participants showed identical improvements of their affected wrists (Left) with an

improvement of 1.38 seconds, demonstrating improvement in dexterity of their injured hand. Lastly, both participants had synonymous improvements in edema measurements with a decrease of 0.4cm in their affected wrists(left), showing that over the six-week period, the swelling of both of their wrists decreased.

Table 3 Physical Outcome Measures

		Participant 1 (Exp) Left affected		Participant 2 (Control) Left affected	
Measurements		Week 1	Week 6	Week 1	Week 6
ROM	Wrist Flexion	20	45	55	60
	Wrist Extension	35	55	64	68
	Supination	17	49	66	65
	Pronation	86	90	90	85
	Ulnar deviation	24	25	30	10
	Radial deviation	20	20	30	25
	Index finger MP/PIP/DIP	70/100/56	75/107/63	67/92/75	74/96/56
	Middle finger MP/PIP/DIP	81/101/70	90/101/84	64/92/50	75/110/74
	Ring finger MP/PIP/DIP	90/107/71	90/100/71	61/74/80	65/115(-6)/55
	Small finger MP/PIP/DIP	84/89/70	88/93/85	40/89/65	50/104(-20)/69
Grip Strength		R 75lb L 30lb	R 90lb L 44lb	R 55 L 13	R 55 L 20
9-hole peg test		R 17.6 sec L 23.62 sec	R 17.0 L 21.00	R 18.03 sec L 20.13 sec	R 19.68sec L 18.75sec
Edema Wrist		R 16.8 cm L 18.2 cm	R 17.1 L 17.8	R 15.7 cm L 16.6 cm	R 15.5cm L 16.2cm

***Green indicates improvement, yellow indicates stagnation, and red indicates regression.*

Research Q2: *Kitchen Confidence and Safety Survey*

Participant One

Survey results from week one show that participant one agreed/totally agreed with 9/10 (90%) statements and disagreed with 1/10 (10%) of the statements. At week six, participant one agreed/totally agreed with 4/10 (40%) statements and disagreed with 6/10 (60%) of the statements. This indicates that prior to the program, participant one had a very low level of confidence in the kitchen as well as a low feeling of safety when participating in cooking activities. However, after the completion of Culinary Care, her confidence and feelings of safety was six times greater than before therapy.

Participant Two

Survey results from week one show that participant two agreed with 8/10 (80%) statements and disagreed with 2/10 (20%) of the statements. At week six, participant two agreed with 1/10 (10%) statements and disagreed with 9/10 (90%) statements. This indicates that prior to the six-weeks of standard hand therapy, participant two had a very low level of confidence in the kitchen as well as low feeling of safety when participating in cooking activities. However, after the six-week period of hand therapy, her confidence and feelings of safety was nine times greater than before therapy. The only statement that participant two agreed with at week six was "I do not own my own adaptive equipment".

Comparison

When comparing the two participants, scores showed that participant two (20%) started out with twice as much confidence and feelings of safety in the kitchen compared to participant one (10%). In week six, both participants showed an increase in confidence and safety, however, participant two increased 20% more than participant one.

Figure 1

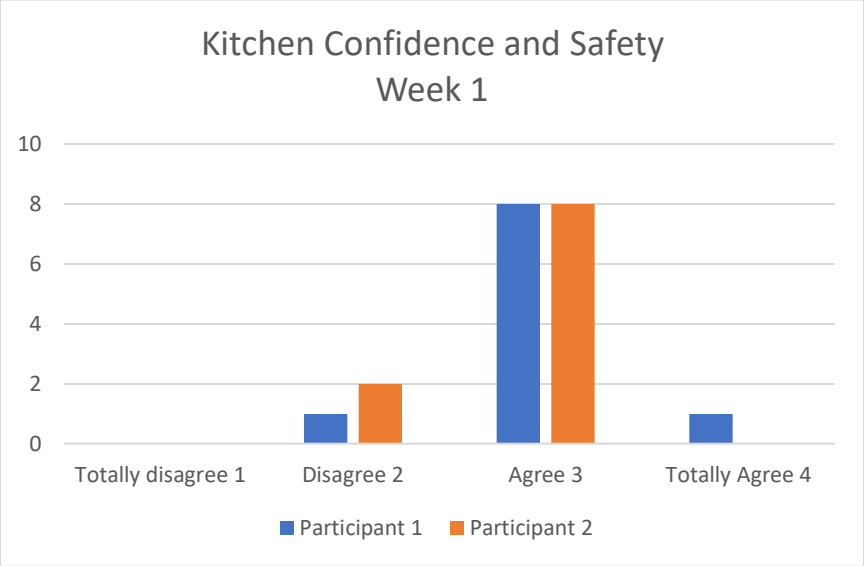
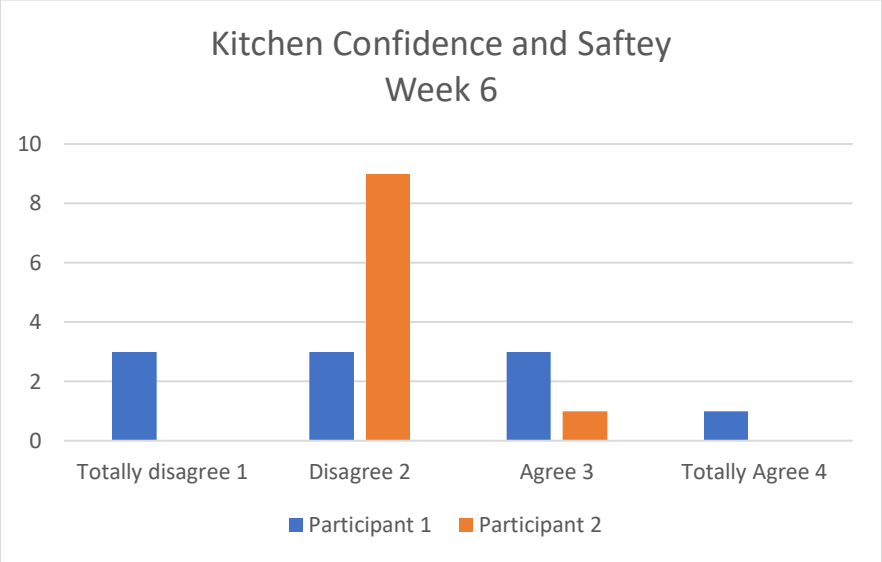


Figure 2



Research Q 3 *Nutrition*

Participant One

Survey results from week one show that participant one agreed with 4/8 (50%) of the questions and disagreed with 4/8 (50%) of the questions. Results from week six show that participant one agreed with 2/8 (25%) of the questions and disagreed with 6/8 (75%) of the questions. This indicates that after the 6-week Culinary Care program, she had an increase in the understanding of nutrition's role in recovery as well as her own ability to make nutritious meals in the kitchen post injury.

Participant Two

Survey results from week one show that participant two agreed with 2/8 (25%) of the questions and disagreed with 6/8 (75%) of the questions. Results from week six show that participant two agreed with 0/8 (0%) of the questions and disagreed with 8/8 (100%) of the questions. This indicates that after the six-week period of standard hand therapy, she had an increase her own ability to make nutritious meals in the kitchen post injury.

Comparison

When comparing the two participants, scores showed that participant two started out with 25% more confidence and understanding of their nutritional capabilities compared to participant one. In week six, both participants showed an increase in scores. However, by the end of the six-week period, participant two showed disagreement with all survey statements, indicating 100% confidence and understanding of nutrition's role in recovery, while participant one showed 75% disagreement with the survey statements, indicating that she still lacked confidence in two (25%) of the statements – "I believe that my ability to cook a nutritious meal has been impacted since my injury", and "I eat take out more often since being injured".

Figure 3

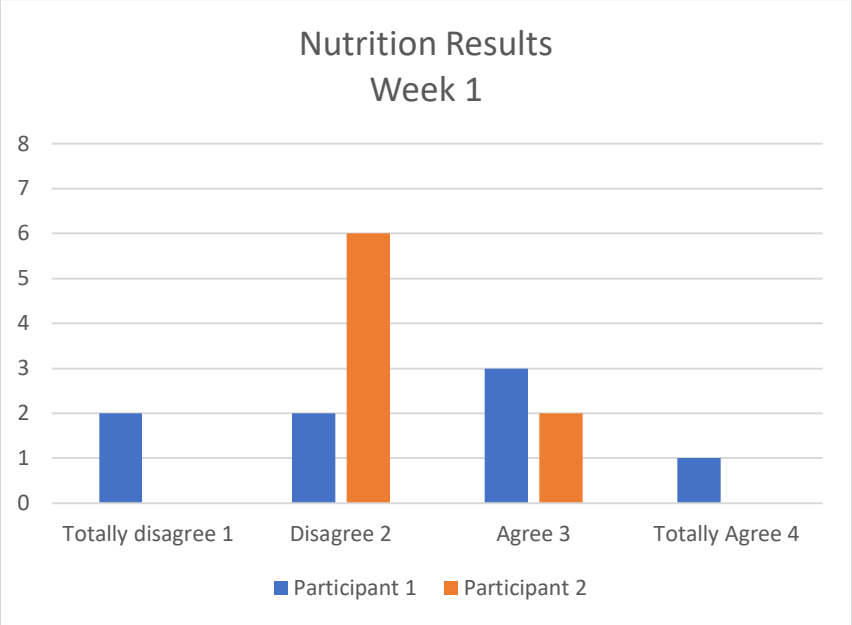
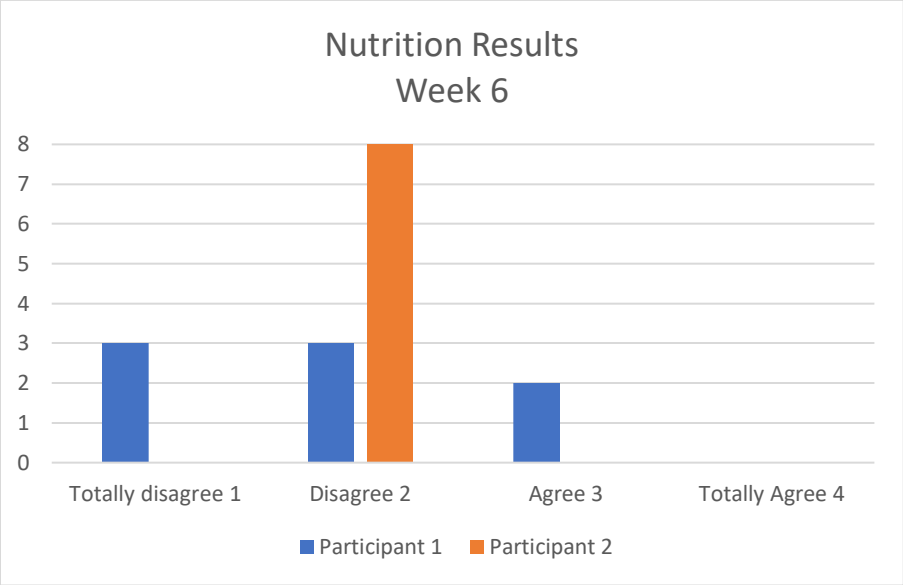


Figure 4



Q4 *Post Intervention Satisfaction Survey*

Since there was only one participant in the experimental group, there is only one post-program survey to be analyzed. Participant one expressed satisfaction with all nine categories listed in the survey regarding the six-week program. She was very satisfied with program location, program time, recipes made, and personal improvement in hand function. She was extremely satisfied with the information given out, the support from leaders, class environment, instructions for all activities and overall enjoyment.

Research Q5: *COPM*

Participant One

The COPM was administered to participant one at the start of the culinary program in order to record their most pressing occupational challenges and track their potential improvement in performance and satisfaction once the study concluded. The five occupational challenges were typing, driving, taking off clothing, cooking, and opening mail. As recorded in *table 4*, at week one, the total score for performance was 27 with an average of 5.4, and the total score for satisfaction was 17 with an average of 3.4. After participating in the six-week Culinary Care program, both scores increased significantly. At week six, the performance score rose to a total of 43 with an average of 8.6, and the satisfaction score rose to a total of 44 with an average of 8.8.

Table 4 COPM Results Participant One

Occupational Performance Problems	**Importance**	**Performance 1**	**Satisfaction 1**	**Performance 2**	**Satisfaction 2**
Typing	10	7	3	8	8
Driving	10	8	5	9	9
Taking off clothing	9	7	5	8	8
Cooking	10	3	3	8	9
Opening mail	10	2	1	10	10
Total score		27	17	43	44
Average Score		5.4	3.4	8.6	8.8

Participant Two

The COPM was administered to participant two at the start of the 6 weeks of standard hand therapy in order to record their most pressing occupational challenges and track their potential improvement in performance and satisfaction once the study concludes. The five occupational challenges were dressing, cooking, carrying bags, pushing a grocery cart, and holding stair rails. As recorded in *table 5*, at week one, the total score for performance was 37 with an average of 7.4, and the total score for satisfaction was 33 with an average of 6.6. After participating in standard hand therapy for six weeks, both scores increased. At week six, the performance score rose to a total of 45 with an average of 9.0, and the satisfaction score rose to a total of 47 with an average of 9.4.

Table 5 COPM Results Participant Two

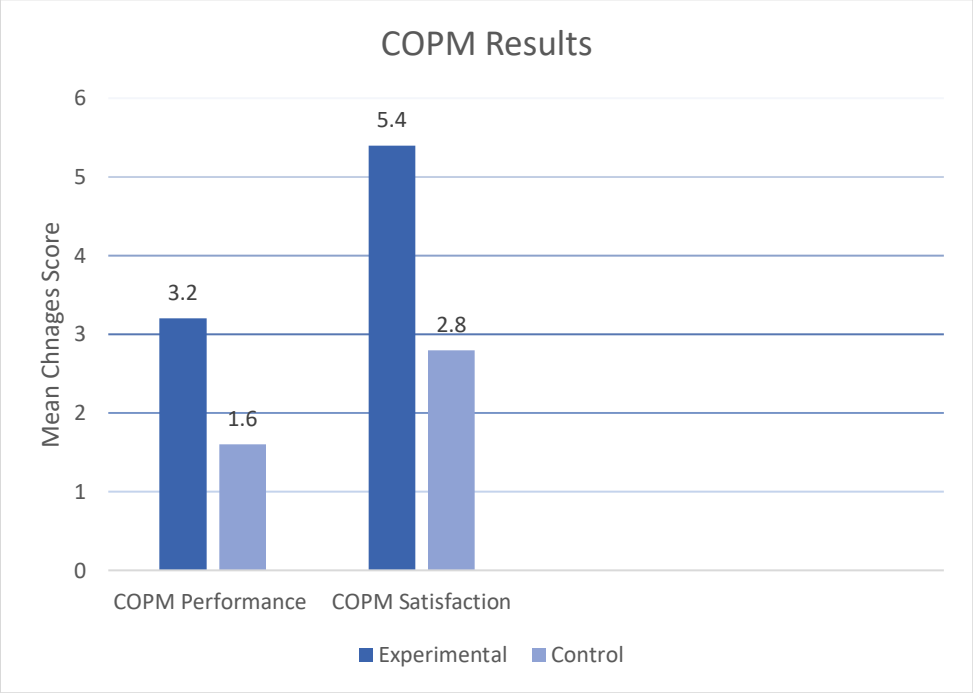
Occupational Performance Problems	**Importance**	**Performance 1**	**Satisfaction 1**	**Performance 2**	**Satisfaction 2**
Dressing	10	7	7	8	9
cooking	10	7	5	9	9
Carrying bags	10	8	7	9	9
Pushing grocery cart	8	8	8	10	10
Holding stair rails	7	7	6	9	10
Total score		37	33	45	47
Average Score		7.4	6.6	9.0	9.4

Comparison

When comparing the two participants and their scores, we see a difference in overall improvement from week one to week six for both performance and satisfaction across all occupational challenges. As shown in *table 4*, the participant in the experimental group started at an average performance score of 5.4 and increased to an 8.6, while the participant in the control group, as shown in *table 5*, started with an average performance score of 7.4 and increased to a 9.0 after the 6 weeks. Additionally, the participant in the experimental group started with an average satisfaction score of 3.4 and increased to an 8.8 while the participant in the control group had an average satisfaction score of 6.6 and increased to a score of 9.4 at week six.

According to *Figure 5*, results indicated that the experimental group demonstrated an increase in occupational performance with a rise in 3.2 points and an increase in satisfaction with a rise of 5.4 points from week one to week six. When looking at the control group, results showed an increase of occupational performance by 1.6 points and occupational satisfaction by 2.8 points between week one and week six. Therefore, the experimental group exhibited a greater increase in overall occupational performance and satisfaction compared to the control group as illustrated in *Figure 5*.

Figure 5



CHAPTER 5: Discussion and Impact

The purpose of this randomized control trial was to test whether an occupation-based cooking program would improve hand function, confidence in the kitchen, and insight into the impact of nutrition on orthopedic recovery for individuals with DRFs. Based on the Culinary Care feasibility trial, it was expected to have at least five participants based on timeline. Despite enrolling five participants, three dropped out of the clinical program As a result, my ability to draw conclusions about potential effectiveness of the program was limited by the N=1 in each condition. However, based on the feedback from the participant on improvement of physical function, reintegration into ADLs, and overall program satisfaction, it demonstrated its potential to be implemented into a clinical setting.

As a pilot study, the main goal was to establish feasibility of the program. In this first phase, validating practicality, potential challenges, and effectiveness with the program's implementation was the primary emphasis. The objective was to assess whether Culinary Care could be successfully executed within the existing parameters, while recognizing obstacles that might impede its viability along the way. Through the results of the post-program survey, it was concluded that the participant was satisfied with all program logistics throughout the 6-weeks. Additionally, scores indicated that the participant in the Culinary Care program experienced improvement in hand function as well as enjoyment throughout the entire program.

This emphasis on feasibility served as a steppingstone for larger-scale implementations. This study aimed to both establish the program's viability and also inform refinements and adaptations that may be necessary for next steps. Therefore, the findings from this pilot study were pivotal in providing insight into its practicality of the program as well as guidance for further developments regarding its integration into larger scaled environments.

Question1 *How effective is a culinary program in increasing ROM, strength, dexterity, and edema in patients with distal radius fractures?*

Results showed that participant one had notable improvements across all physical outcome measurements consisting of ROM, grip strength, dexterity, and edema. She had 75% overall physical improvement after completing Culinary Care. Not only did she experience great progress over the six weeks, but the margin of improvement for many of the measurements were considerable. Wrist flexion and supination increased by over 100% and wrist extension increased by over 50%. Additionally, all ROM measurements improved to functional ranges after the six-weeks of engaging in Culinary Care. Based on the Handexer Dynamometer typical grip strength chart (Appendix 6), a normal grip strength for a 60-year-old woman is 37.9-68.3lbs lbs. According to week one measurements, her left-hand grip strength would have been categorized as week in the Handexer Dynamometer chart. However, after completing the Culinary Care program, her grip strength increased, transitioning from the weak category to normal grip strength for her age and gender. Additionally, when analyzing grip strength, not only did we see almost a 50% increase in the left (injured) hand, but we also saw a significant increase in strength of the right (unaffected) hand. While Culinary Care targeted to help the injured hand regain function, most activities incorporated bilateral work. The grip strength results indicate that the activities completed during the program, such as squeezing, cutting, peeling, and mixing, helped both hands get stronger, not just the injured one. Recognizing an increase in strength in both hands highlights the importance of utilizing occupation-based activities which often involve bilateral engagement. Participant one also had improvements in dexterity as measured through the 9-hole peg test indicating that the 6-weeks of Culinary Care supported a greater ability to make coordinated movements with their fingers and hand to fulfill the certain activities. When

analyzing the overall physical improvements of participant one's wrist, hand, and fingers, we see significant improvements that translate to increased function in the kitchen of the injured extremity.

Participant two, who was a control, showed physical improvements in 58.3% of the measurements taken over the six weeks. Week one measurements show that participant two began the six-week period with functional range of motion in 17/18 (94%) measurements. This denotes that she started out the study with the necessary range of motion in their wrist, hand and fingers to complete all functional tasks. By the end of the study, she demonstrated improvement in 67% of the ROM measurements compared to week one indicating that the standard hand therapy received allowed for an increase in movement across all joints. However, a handful of the measurements taken at week six exhibited less than a 10% increase in ROM such as flexion with only a 9% increase and extension with a 6% increase. Additionally, week six measurements demonstrated a decrease amongst 6/18 (33.3%) ROM measurements, four of which were at the wrist joint. This indicates that once participant two reached functional range of motion, hand therapy alone was not sufficient enough to continue significant physical improvement. Furthermore, participant two exhibited an improvement in overall grip strength of the left hand from week one to week six with a 7 lb. increase. However, what's important to recognize is that there are functional norms for grip strength just as there are range of motion, and these standards are what many times guides the goals being set in therapy. Based on the Handexer Dynamometer typical grip strength chart (Appendix 6), a normal grip strength for a 73-year-old woman is between 32.4 lbs. and 54lbs. A weak grip strength for those same demographics is less than 32.5 lbs. This displays that despite the improvements of participant two's grip strength over the six weeks, she still did not reach functional grip strength, remaining in the weak category. These

data highlight how standard hand therapy may have the ability to help yield physical improvements amongst patients' recovery from injury, however as the only therapeutic method, may not have the full capacity to enable the necessary functional goals. Participant two also demonstrated improvements in dexterity as measured through the 9-hole peg test indicating that the six-weeks of hand therapy supported a greater ability to improve coordination of the fingers and hand in order to fulfill various activities.

Data showed that the participant in the culinary intervention physically improved by a greater margin from week one to week six compared to the individual in the control group. Overall, participant one had greater improvements from week one to week six amongst the ROM measurements compared to participant two. Additionally, participant one's grip strength not only doubled participant two's grip strength, but they also ended the study with functional grip strength for gender and age compared to participant two who was still a considerate amount below the standard norm. Culinary Care consisted of weekly cooking tasks which allowed for direct translation of culinary activities at home. This enabled the participant to work on their unique physical deficits post injury in the kitchen, such as range of motion, strength and dexterity, in order to safely fulfill cooking tasks. This suggests that the six-week cooking program, with which participant one took part in, facilitated more functional movement across all planes leading to increased hand function. As presented in *table 2*, participant one showed 75% improvement amongst all physical measures taken, compared to the control group which was found have 58.3% improvement. This indicated that the OBI program could lead to greater physical improvements after injury compared to the standard hand therapy.

Question 2 *How effective is a culinary program in improving functional reengagement in cooking, kitchen safety and confidence in patients with distal radius fractures?*

Participant one showed increased improvement over the 6-week Culinary Care program, demonstrating a greater percentage of confidence and safety in the kitchen after the completion of the program. This indicates that the activities completed, tasks practiced, and strategies taught throughout the program, gave participant one an increased confidence in their ability to independently complete cooking activities and feel safe doing so. More specifically, it is important to identify the answer choices from survey statements that changed from week one to week six. Survey results showed that 70% of the statements improved over the six-week program, demonstrating substantial improvement in confidence and safety in the kitchen. The statements that changed from totally agree/agree to disagree/totally disagree were: I have hurt myself in the kitchen before, I have not found ways to improve my safety in the kitchen, I am unaware of the various pieces of adaptive equipment I can use in the kitchen, I do not own my own adaptive equipment in the kitchen, I do not know how to complete activities in the kitchen safely to prevent further injury, and I do not feel confident doing everything I used to do in the kitchen after my injury. The improvement expressed through these statements after the completion of the program indicate that the activities completed, and the skills taught throughout Culinary Care gave participant one the physical abilities and the tools to safely complete cooking tasks in order to gain back the confidence to independently engage in culinary activities.

Participant two also showed increased improvement over the six-week period demonstrating a greater percentage of confidence and safety in the kitchen after the completion of standard hand therapy services. Results showed that the participant disagreed with 20% and agreed with 80% of the statements indicating very low confidence and feelings of safety in the kitchen. After the six weeks of standard hand therapy, results showed 90% disagreement and 10% agreement with the statements showing a very large increase in kitchen confidence in

safety. This increase in positive perception towards cooking and safety indicates that the physical improvement achieved through the hand therapy services enabled a greater ability to engage in cooking more safely and more confidently. Participant two did not engage in any occupation-based programs while in therapy, yet still showed significant improvements in survey scores. This is important to recognize, as it highlights the impact that ROM, strength, and dexterity, which are all three targeted in standard hand therapy, can have on re-engagement into daily occupations.

Furthermore, comparing the results of both participants and their progress throughout the six weeks, we see significant improvement from both women. When looking strictly at the percentage of increase from week one to week six, results show that participant two improved by 20% more in total from start to finish compared to participant one. This tells us that increased kitchen confidence and feelings of safety can potentially improve after taking part in hand therapy without any occupation-based services. However, due to the small sample size of one participant per group, it is difficult to conclude that hand therapy is or is not still sufficient enough on its own without any occupation-based services to improve confidence and feelings of safety in the kitchen because data is only reflective of one individual in the control group.

Question 3 *How effective is a culinary program in increasing confidence and understanding in nutrition in patients with distal radius fractures?*

Participant one showed increased improvement over the six-week Culinary Care program, demonstrating a greater percentage of knowledge of nutrition's role and confidence in their ability to cook healthier foods after the completion of the program. This indicates that the nutritional education provided taught participant one the key role of nutrition in their own physical recovery, and ways to incorporate healthier options into her meals. Additionally, this improvement demonstrates how Culinary Care gave her confidence in her abilities to cook

nutritious meals despite the challenges that her injury brought in the kitchen, by practicing the specific movements and activities, using adaptive equipment, and learning safe ways to complete each task. More specifically, it is important to identify the answer choices from survey statements that changed the most. In the statement "I do not understand the impact that nutrition has on my recovery", participant one selected "agree" at week one. By week six, their answer had changed from "agree" to "totally disagree", indicating that the nutritional education provided throughout the program gave them the knowledge to understand how nutrition can impact their own recovery process. The statement, "I believe the meals have changed since my injury" was initially agreed with at week one but changed to disagree by week six. This suggests that the deficits resulting from her injury, which had adversely affected her meals, were mitigated as their physical abilities improved, enabling a return to their usual meal creation and preparation. Analysis of the participant one's results show that Culinary Care could have the ability to enable participants to gain a deepened knowledge and confidence regarding nutrition and an increased awareness of the role it plays in their orthopedic health.

Participant two showed great improvement over the six-week period of standard hand therapy, reporting that they had 100% confidence in their ability to cook healthier meals and had deep understanding of nutrition's role in their rehabilitation. This implied that participant two fully understood the role of nutrition and no longer had any doubts regarding their abilities to cook nutritious meals in the kitchen with their injury. The standard hand therapy that she took part in had no nutritional education provided during the six weeks, yet scores regarding nutrition increased by 25%. Participant two started off the six-weeks with disagreement in all statements but two. The areas that they had confidence in prior to the six-weeks starting were regarding their own balanced diet, their satisfaction with the types of meals they cooked, their belief in the

importance of nutrition in their recovery, the impact their injury had on eating takeout, and the seriousness with which they take their nutritional health. This showed that at the start of the six-weeks they felt as though they already had the ability to manage their own nutrition with strong existing knowledge in the area. When taking a closer look at the two statements that changed over the six-weeks from agree to disagree, indicating improvement, we can start to make sense of what may have caused this shift from 75% to 100%. The two statements that improved form agree to disagree were "I believe that my ability to cook a nutritious meal has been impacted since my injury" and "I believe that the meals I make have changed since my injury". These two statements are related to the participant's ability to physically cook a healthy meal after sustaining a distal radius fracture, while the others are about nutritional knowledge and her perception of her own health status. Therefore, the two areas of improvement participant two reported were both regarding physical ability. This indicates that the physical improvements attained through the six weeks of hand therapy received enabled her to regain enough hand function to return back to the cooking and eating habits they had prior to her injury. The responses for the other six statements stayed the same from pre and posttest showing no change.

Analysis from the nutrition survey indicates that both participants one and two had an increase in their feelings of confidence and understanding in nutrition after the six-week period. Participant two expressed 100% disagreement will all survey statements at the end of the six-weeks while participant two expressed 75% disagreement with the statements. This indicates that participant two had greater overall feelings regarding nutrition and their cooking abilities before and after the six weeks despite not taking part in Culinary Care. However, analysis showed that participant two's improvement was a reflection of physical improvement from hand therapy, whereas participant one showed improvement in nutritional knowledge and understanding in

addition to physical abilities. However, due to the small sample size of one participant per group, it is difficult to conclude that hand therapy is or is not sufficient enough on its own without any occupation-based services to improve confidence and understanding in nutrition because data is only reflective of one individual in the control group. These results show the potential that Culinary Care has to bring both awareness of nutrition's role in orthopedic recovery to patients, as well as the tools for them to instill in their own kitchens.

Program Satisfaction

Results indicate that the six-week Culinary Care program was both enjoyable and satisfactory amongst all given categories. The participant who completed the program indicated that she was very satisfied with the time and location of the program in addition to the recipes made and personal improvement in hand function. She expressed extreme satisfaction with information given, support from leaders, class environment, activity instructions and overall enjoyment of the full experience. This feedback indicates that Culinary Care provided a safe and comfortable environment, was informative, educational, therapeutic, engaging and fun! Receiving overall satisfaction from the program gives a great starting point to move forward in this direction and build upon the foundation established in this capstone experience.

COPM

Participant one exhibited improvement in performance and satisfaction for all five chosen occupations from week one to week six. When first asked to give a rating of her performance level for all five activities, she averaged a score of 5.4, with a rating of 3 specifically for cooking. This indicated that she perceived her overall performance of meaningful occupations as subpar due to the limitations from her wrist fracture. When reassessed after the completion of Culinary Care, her performance rating increased by 59% ending with an average of 8.6. Furthermore, her perceived performance of cooking increased by 167% giving a score of 8 at week six. This

shows that not only did her overall performance increase across all tasks, but cooking, the specific occupation addressed in Culinary Care, improved drastically. This improvement exemplifies how Culinary Care improved her culinary abilities, while also extending its impact to bolster her proficiency in tackling other challenging tasks. This underscores the interconnected nature of physical movements, grips, and strength across various activities, suggesting that practicing one skill can catalyze improvement in others. When examining her satisfaction scores, we also see improvement over the 6-week period. Participant one's satisfaction scores averaged a 3.4 at week one and increased by 156% scoring an 8.8 at week six. Looking at satisfaction is just as important as performance scores because it can indicate whether the patient is functioning at the level they want or need to in that specific occupation. This large jump that participant one experienced in satisfaction over all five occupations indicates that the activities and tasks completed during this program helped her progress physically, not only in cooking, but in the 4 other activities listed: typing, driving, taking off clothing, and opening mail. This translation shows the potential that OBIs have on the rehabilitation from upper extremity injuries and impairments.

Participant two exhibited improvement in performance and satisfaction for all five chosen occupations from week one to week six. When first asked to give a rating of her performance level for all five activities, she averaged a score of 7.4 and gave an average satisfaction score of 6.6. When reassessed after six weeks of hand therapy, her performance rating increased by 21.6% and her satisfaction rating increased by 42.4%, ending with a performance average of 9.0 and a satisfaction average of 9.4. This increase in both performance level and satisfaction level indicates that the hand therapy she received endorsed greater physical abilities which in turn led to better functional performance and satisfaction. All of her scores were above equal to or greater

than an 8 at week six, suggesting that her physical improvements enabled a successful return to all five of her meaningful occupations.

When comparing COPM results between participants, we see various differences at both week one and week six. First, out of the 5 occupational challenges expressed by both participants, only two of the five were shared between them: cooking and dressing. This demonstrates how despite their same injury; they experienced different functional obstacles. When addressing their self-perceptions of performance and satisfaction, participant one had an average rating of 5.4 (performance) and 3.4 (satisfaction) at week one and participant two had an average rating of 7.4 (performance) and 6.6 (satisfaction). This shows a clear difference in their week one starting points, indicating that participant two was performing at a 37% higher level than participant one and had 94% higher feelings of satisfaction with their performance compared to participant one. When addressing week six, we see an increase in scores from both participants, but a greater rating jump from participant one for both perceived performance and satisfaction. This suggests that participant one felt a greater increase of improvement with her occupational challenges from week one to week compared to participant two. However, since participant two started at a higher rating for both performance and satisfaction, she had a smaller margin of improvement to experience between week one and week six. Nevertheless, it is important to note that with varying occupational challenges and ratings based on self-perception, it is difficult to compare two people's scores to one another, especially with such contrasting starting points. The qualitative nature of occupation-based outcome measures renders each individual report unique and distinct. Therefore, results defy straightforward comparison, unlike objective clinical measures such as ROM and grip strength. While we can compare general

starting points and degrees of improvement, direct comparisons remain elusive due to the nuanced nature of these outcomes.

COPM vs. DASH

The DASH, which is used in many orthopedic rehab clinics, is an outcome measure used to determine functional limitations after an injury. However, this study demonstrates that when compared to the COPM, the DASH falls short in asking the right questions in the most effective format to reach its goal. During this program the COPM was utilized as the occupation-based outcome measure to track improvement over the six weeks. Additionally, the data from the COPM was used as a comparison to the standard DASH used daily in the clinic to identify what information the COPM gathered that the DASH did not. For participant one, out of the five occupations identified in the COPM as the most challenging post injury, only one of them was partially mentioned in the DASH: use a knife to cut food. For participant two, out of the five occupations identified in the COPM as the most challenging post injury, only two of them were mentioned in the DASH: carrying a shopping bag or briefcase and using a knife to cut food. This clearly illustrates that some of the toughest occupations identified by patients after injury in the COPM, are not even listed as an option in the DASH. Since the DASH provides a list of fixed activities to rate, it immediately limits the patient's ability to include their unique occupational challenges with comprehensive detail. This makes it more challenging for their therapy to be client-centered and unique to their respective environment, culture, routine and priorities.

Further Implementation

Due to a limit in time for the capstone project, data collection was restricted to only two time points. Therefore, in the future, Culinary Care will be run over a longer period of time and with

at least one more point of data collection. It is crucial to acknowledge that a larger and more widespread dataset would significantly enhance the depth of this study. The inclusion of greater data points enables the research to capture a wider variety of patterns, trends, and insights which can enrich the overall strength of its findings. Even though the current study was constrained by temporal factors, its current research represents the foundation upon which future studies could build on to produce more comprehensive results and knowledge in this area.

Furthermore, in the future, Culinary Care will only be run with a larger sample size in order to generalize the results and prove significance as well as effectiveness. A larger sample size is needed to reach a greater variety of individuals who differ in gender, race, culture, age, and health, all of which can have an impact in recovery from an injury. Additionally, all three surveys given out in the program will be analyzed and refined in order to gather more accurate and streamlined data from all participants.

After the conclusion of Culinary Care, Marcia Toye-Vego expressed interest in being a part of the continuation of this program post-graduation as I begin my career as an occupational therapist at Emory Musculoskeletal Institute. This continued support will enable Culinary Care to flourish and grow into a program that can potentially be implemented not only at Emory, but at other hand therapy clinics across Georgia.

Long Term Impacts

The study contributes to the body of occupational therapy research by bringing to light the clear gap between the current state of hand therapy and the overall goal of functional reengagement into meaningful occupations. The current body of evidence suggests that there is a lack of OBIs within the hand therapy setting. Hence, Culinary Care is dedicated to elevating the process of upper extremity rehabilitation by bringing OBIs to the forefront, synergistically

enhancing the hand therapy services provided to patients. Culinary Care has the potential to not only bring attention to the lack of OBIs in hand therapy, but to also bring back the innovation and creativity that this subgroup of occupational therapy is lacking. While Culinary Care homed in on the culinary challenges that individuals with distal radius fractures face post injury, its long-term goal is to expand its services to a variety of injuries and impairments and their corresponding occupational obstacles. This expansion can enable therapists to look beyond anatomical improvements alone and elevate their therapy to reflect a client-centered and comprehensive care plan for each patient.

Limitations

While my study provides valuable insights into the importance of OBIs within hand therapy, it is important to acknowledge several limitations that may impact the interpretation and generalizability of our findings. First, the small sample size affected the generalizability and reliability of the findings. The study cannot be representative of the broader population, making it challenging to apply to different groups of people. The small size of the sample may also lead to greater variability in participant characteristics which can make it difficult to determine is the observed effects are due to random choice or the actual intervention. With this small sample size, it was harder to recruit a wider variety of gender, race and SES as well. This adds to the study's inability to generalize its findings to the greater population.

Another limitation of the study is the strict time frame given to run the recruitment process and the program. The 14-week timeline posed a challenge with recruiting a large enough sample for both the control and experimental group. There is no telling when people will get injured and what injury they will sustain. Therefore, having a strict period of time when

recruitment is necessary regardless of the prevalence of that injury, creates a challenge of sample size.

The reliance on self-report measures, such as the COPM, the DASH, the VAS, and the two cooking surveys, introduces the possibility of response bias and social desirability (Paulhus, 1970). Participants may not have provided entirely accurate or unbiased responses, affecting the validity of certain conclusions. Despite these limitations, our study contributes useful and valuable information to occupational hand therapy and offers a foundation for future research. Researchers should be mindful of these limitations when interpreting and building upon the current findings.

CHAPTER 6: Implementation Plan

After completing my capstone, Emory Musculoskeletal Institute remains committed to further refining this program by allowing me to continue my research and conduct further studies post-graduation as a working OT in their clinic. Goals for Culinary Care in the future are to expand its services to other orthopedic conditions such as elbow fractures, hand and finger fractures, rheumatoid arthritis and osteoarthritis. However, in the short term, the main goal is to run this study again as created and gather substantial data with a larger sample size to prove effectiveness. In order to increase the sample size, recruitment will be strategically conducted when there are at least ten distal radius fractures being treated in the clinic. The study will only be run when there are at least five participants in the experimental group and five in the control group. This will give future studies the ability to gather increased data that is both significant and generalizable to the greater population.

Future Timeline

- Two years→ Culinary Care will be run at Emory Musculoskeletal Institute but with access to patients receiving therapy from all OTs at the clinic. This will allow for a greater sample size. Additionally, the program will include other similar conditions as listed above.
- Five years→ Have a contract with a chefs' kitchen in the area to utilize for larger programs and various other skill sets (using oven, microwave, stove). This larger space will also allow for a greater number of participants. Additionally, receiving grant funding to run the program is a goal as it will give the program the financial ability to get the necessary equipment for a larger group of participants (adaptive equipment, recipe ingredients, and individual kitchen materials).

- Ten years→ The program will be run at ten plus clinics around Georgia.

CHAPTER 7: Conclusion

Occupational therapists are key players in the rehabilitation of individuals with musculoskeletal disorders of the upper extremity. It is crucial that occupational therapists understand the most effective way of helping to heal impairments while also supporting clients in their re-engagement back into purposeful occupations. Therefore, the methodology used by hand therapists needs to be one that fuses both the biomedical and occupation-based approach in order to provide care that prioritizes each patient as an entire person, not just their impairments. Therapists have the ability to motivate and encourage clients by emphasizing the connection between rehabilitation and the continuation of meaningful activities, including education, work, sleep, self-care, leisure, and social participation. The concept of occupation-based hand therapy is an approach to treatment that harmonizes the importance of occupation as a therapeutic mechanism with the value of upholding sound biomechanical principles. OBIs promote participation in daily life and functional independence, addressing the multidimensionality of hand function beyond the mere anatomical recovery. Culinary Care was created to do just that and more. Analysis of the results indicate that Culinary Care can be an effective component of hand therapy. This program not only exhibited the feasibility to be run successfully, but it also showed potential to positively impact the progression of a patient's rehabilitation process, physically, emotionally, and occupationally. Physically, it fostered engagement that led to tangible enhancements, such as improved ROM, strength, and dexterity, which are all crucial elements in hand therapy interventions. The hands-on nature of cooking activities likely contributed to these physical improvements, as they promoted grasping techniques and fine motor skills in a functional context. Emotionally, Culinary Care boosted confidence and provided a sense of accomplishment as each culinary task was completed and progress became

more and more evident. This instilled a sense of motivation for the continuation of occupational engagement in and out of the kitchen, as well as the conviction to safely try new tasks and take the education provided into their own life. Occupationally, Culinary Care offered the opportunity to engage in purposeful and meaningful activities. By incorporating real-world tasks into the interventions, Culinary Care facilitated the transfer of skills learned in the program to functional activities at home and in their environment. This occupation-based program not only holds the potential to enhance the effectiveness of therapy, but also promotes autonomy and independence in individuals' daily life. With comprehensive and holistic care remaining at the forefront of Culinary Care, we aim to prioritize each patient's uniquely meaningful occupations by providing a space to both heal physically as well as grow in confidence to regain independence.

As we bring our attention to the great demand for OBIs, it is imperative we remain aware of the most appropriate and effective occupation-based measures that pave the way for these comprehensive interventions. The COPM provides a way to gather qualitative data that gives therapists the ability to tailor care directly to the patient with functional re-engagement as the primary goal. By allowing the patient to express their priorities and give insight into the impact that their injury/impairment has had on them, the therapy they receive can be occupation-based, considering the physical, cognitive, emotional and environmental factors that influence their overall engagement. Additionally, setting goals related to meaningful activities allows both the therapist and patient to work collaboratively towards achieving the best outcomes for rehabilitation. Therefore, utilizing the COPM in addition to the preexisting measures used in the clinic, such as the DASH, can elevate hand therapy by bridging the gap between the current state of care and its overall goal of comprehensive and unique treatment.

As we look towards future endeavors, Culinary Care will remain committed to enhancement and refinement before its next study at Emory. The limitations that were recognized will be addressed and resolved before the next implementation in order to provide the best care as well as gather the most informative data post injury.

Implications:

- There is a discontinuity between the current structure of hand therapy and the core of occupational therapy.
- Hand therapy falls short in its approach to rehabilitation due to solely following the biomedical model without also including the occupation-based approach.
- Occupational therapy practitioners should incorporate more occupation-based interventions throughout their therapy sessions once the patient is medically cleared to perform those specific activities.
- The COPM should be used as the primary occupation-based measure used in the clinic by hand therapists.
- Nutrition plays a role in orthopedic recovery. Thus, therapists having the basic knowledge on the factors that may impact an individual post injury, can serve as a helpful tool for the patient.
- Hand therapy needs look beyond the anatomical structures and think more holistically in order to provide client-centered care and achieve the primary goal of helping patients return to their meaningful occupations

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Appendix 1: Learning objectives

Learning objectives (LTGs) (What you hope to learn; must fit with the GSU OT Curricular Design & Objectives) ***Include 2-4**	**Short-term objectives (STGs)** (Short-term steps to help you reach your learning objectives) ***Include 2-3/objective**	**Learning activities** (What you will do to achieve the learning objective) ***Include 2-4/objective**	**Outcome measures** (What will you produce as evidence for achieving the learning objective; the deliverables of your project)	**Timeline for completion** (When will this outcome measure be completed) **This section will be completed in the summer semester*
1.Rebecca will create a culinary program that will target • Dexterity • Edema • strength • ROM • Function • Satisfaction • Confidence	1A. Rebecca will interview clients with DRF on areas of kitchen activities that are most challenging. COPM 1B. Rebecca will come up with recipes and culinary activities being made in the program that align with targeted therapeutic goals. 1C. Rebecca will receive nutrition education to best create a nutritional guide for patients in the program. 1D. Rebecca will do necessary research on where the gap lies within the current state of hand therapy.	1a. Take information from interviews on most challenging kitchen tasks 1b. plan out the kitchen activities that align with these results. 1b. Rebecca will write the intro of her literature review to show the evidence on the gap in orthopedic hand therapy clinics.	1.Outcome measures: a) ROM measurements b) Grip strength measurements c) Edema measurements d) Dexterity measurements e) Functional ability f) Satisfaction 2.Literature review introduction	Outcome measurements will be taken in the spring. Literature review intro done by end of August
2. Rebecca will teach and incorporate assistive technology that is helpful for the	2A. Research assistive technology that matches the most challenging areas	2a. Create a document for the participant to have that lists of ATs	ii. The answers from the Pre and post survey will give info as to whether the patients feel like the assistive tech helps to	

DRF deficits presented in the kitchen in order to increase kitchen safety.	of kitchen activities. 2B. Collect 10 pieces of assistive tech for the kitchen to physically use in the program.		improve function in the kitchen.	
3. Rebecca will include nutritional education in her culinary program in order to inform patients with a DRF about the impact of nutrition on recovery.	3A. Rebecca will find a functional nutrition course to take. 3B. Rebecca will create a survey for pre and posttest. 3C. Nutritional aspects will be identified as ways to increase successful recovery and nutrition for clients.	3a. Take the functional nutrition course and take the certification exam. 3b. Create a guide to healthy eating habits for clients based on the course taken.	i. Rebecca will pass the exam and become certified as a Functional nutritionist. ii. A PowerPoint will be made and presented to the program participants.	Done by November
4. Create a standardized treatment protocol so the program can be easily recreated by another healthcare professional.	4A. Rebecca will create a timeline of when tests are being given and when measurements are taken. 4B.A schedule will be created with information on every aspect of the program that week.	4a. Make the pre and post surveys. 4b. Create a chart where all outcome measures are easily identified in an organized fashion. 4c. Create all consent forms.	i. Results from survey ii. Consent from all patients to be a part of the program. iii. Deliverable of the schedule.	Done by December
5.Create a website for the Culinary Care program	4A. Find a good platform to make a website. 4B. Choose what is going to be included in website	4a. Create website design. 4b. Create an outline for website layout.	1.A running website will be created for future implementation.	Done by May

Appendix 2: Supervision Plan

Doctoral Capstone Experience Supervision Plan			
	Student: Rebecca Cohen	Site Mentor: Marcia Toye-Vego	Faculty Mentor: Dr. Wen
Topic	**Description**	**Description**	**Description**
Roles/responsibilities	• Write up literature review with completed into and methods section • Submit IRB latest by November • Take Functional Nutrition Course and complete by end of August • Take exam for certification by Mid-September • Create nutrition PowerPoint for program • Formulate manual for entire program start to finish • Create consent forms and surveys • Compile all measurements for each patient into one organized place • Measure patients in experimental group and control group at the scheduled time points of program • Student will run 6-week program • Present at the end of the spring	• Inform the student of incoming patients with a DRF that may be a suitable candidate for program. • Give CHT to all patients throughout the 12 weeks. • Attend the 6-week program weekly with the student. • Give guidance and expertise wherever it can be helpful. • Attend the scheduled meetings for program with the student throughout the spring • Read over necessary documents given by the student	• Provide guidance on research related questions. • Keep the student aware of requirements for research deadlines, publishing work, etc. • Give feedback on lit review
Tracking Progress	• Regular feedback sessions during weekly and monthly meetings • Address goal completion each week • There will be a form for both the student and the stie mentor to fill out regarding progress and areas for improvement	• Give feedback to the student on how they are working in the clinic as well as how the weekly program is running. • There will be a form for both the student and the stie mentor to fill out regarding progress and areas for improvement	• During the monthly meetings, the student will communicate all goals achieved and current status of the project as well as literature review progress.

Communication methods	Email: rrcohen3@gmail.com Cell: 404-556-0773 Meetings are in-person. Email is a last resort for communication. Resolving Disputes: • Open communication • Active listening • Define common goals • Acknowledge contributions • Brainstorm solutions • Compromise • Document agreements • Have regular check-ins	Email: marcia.toyevego@emoryhealthcare.org Cell: 404-351-5936 Meetings are in-person. Email is a last resort for communication. Resolving Disputes: • Open communication • Active listening • Define common goals • Acknowledge contributions • Brainstorm solutions • Compromise • Document agreements • Have regular check-ins	Email: pwen@gsu.edu Meetings are via Webex.

Scheduled meetings	• Bimonthly meeting recap
	  ○ Purpose: discuss status of patients, timeline, program, etc.
	• Weekly check-ins at Emory
	  ○ Purpose: go over patient progress that week and any needed changes to schedule.
	• Student will attend Emory 3days/week to be in clinic and work with patients
		• Bimonthly meeting recap with student outside of Emory
		• Weekly meeting at Emory with student
			Monthly check-in with student to go over progress program
			• Jan: 1 mtg
			• Feb: 1 mtg
			• Mar: 1 mtg
			• April: 1 mtg
			***Add more if necessary

Project specific requirements	◊ Literature Review intro and methods +IRB submission	Read over all documents created for the program and give any suggestions for ways to improve it.	Give feedback on structure of any and all deliverables for research (IRB, lit review, manuscript, presentation)
	◊ Completion of nutrition course and certification exam		
	◊ Schedule for program	Provide hand therapy to all patients for the six weeks at Emory clinic.	
	◊ PowerPoint for nutrition with presentations for each week		
	◊ Document with all recorded measurements from six weeks	Work with the student to collect data and then aid in creating a deliverable for the program's results.	
Project timeline	December • 12/18-12/25 patients are recruited and begin CHT	December • 12/18-12/25 patients are recruited and begin CHT	

	therapy for the next 6-8 weeks. • Patients fill out all consent forms.	therapy for the next 6-8 weeks. • Patients fill out all consent forms.	
	January • Patients continue CHT and measurements are taken at each scheduled time point	January • Patients continue CHT	
	February: • 02/05: 6-week program begins for experimental group • Measurements are taken and recorded for both groups	February: • 02/05: 6-week program begins for experimental group • Measurements are taken and recorded for both groups	
	March • 03/19: Program ends • Final measurements are taken and recorded for both groups. • Surveys sent out to all participants.	March • 03/18: Program ends • Final measurements are taken and recorded for both groups. • Surveys sent out to all participants.	
	April • Continue manuscript and create presentation for deliverable		
	May • All done and graduate!		
Outcome Measures and tools	ROM • Goniometer	The student will administer these outcome measures to the patients are the scheduled time points.	
	Grip Strength • Dynamometer		
	Edema • Circumferential		
	Dexterity • Jebson Taylor		
	Perceived Occupational Performance • COPM		
	Overall Satisfaction • Nutrition Survey • Kitchen Safety Survey		

	• Program Feedback Survey		
Forms	Consent forms are created for distribution to patients	• Review consent forms made by the student and make any necessary changes.	
Organizational methods	• OneNote • Client charts in the clinic • Physical Binder	• Client Charts	• iCollege Submission • Email

Appendix 3: Surveys

Nutrition

	1 Totally Disagree	2 Disagree	3 Agree	4 Totally Agree
I believe that my ability to cook a nutritious meal has been impacted since my injury	○	○	○	○
I am unsatisfied with the types of meals I have been eating since my injury	○	○	○	○
I am not eating a balanced diet	○	○	○	○
I believe that the meals I make have changed since my injury	○	○	○	○
I do not take my nutritional health seriously	○	○	○	○
I eat takeout more often since being injured	○	○	○	○
I do not understand the impact that nutrition has on recovery	○	○	○	○
I do not believe that nutrition should be a priority in rehab for an injury	○	○	○	○

Kitchen Confidence and Safety

	1 Totally Disagree	2 Disagree	3 Agree	4 Totally Agree
I have hurt myself in the kitchen before	○	○	○	○
I feel unsafe cooking with my injury	○	○	○	○
I cannot use the same tools in the kitchen as I did before my injury	○	○	○	○
I avoid certain kitchen activities because I am scared of further injury or physically just cannot do it	○	○	○	○
I have not found ways to improve my safety in the kitchen	○	○	○	○
I am unaware of the various pieces of adaptive equipment I can use in the kitchen	○	○	○	○
I do not own my own adaptive equipment in the kitchen	○	○	○	○
I often have to ask for help with kitchen activities due to my injury	○	○	○	○
I do not know how to complete activities in the kitchen safely to prevent further injury	○	○	○	○
I do not feel confident doing everything I used to do in the kitchen after my injury.	○	○	○	○

Post Program Questionnaire

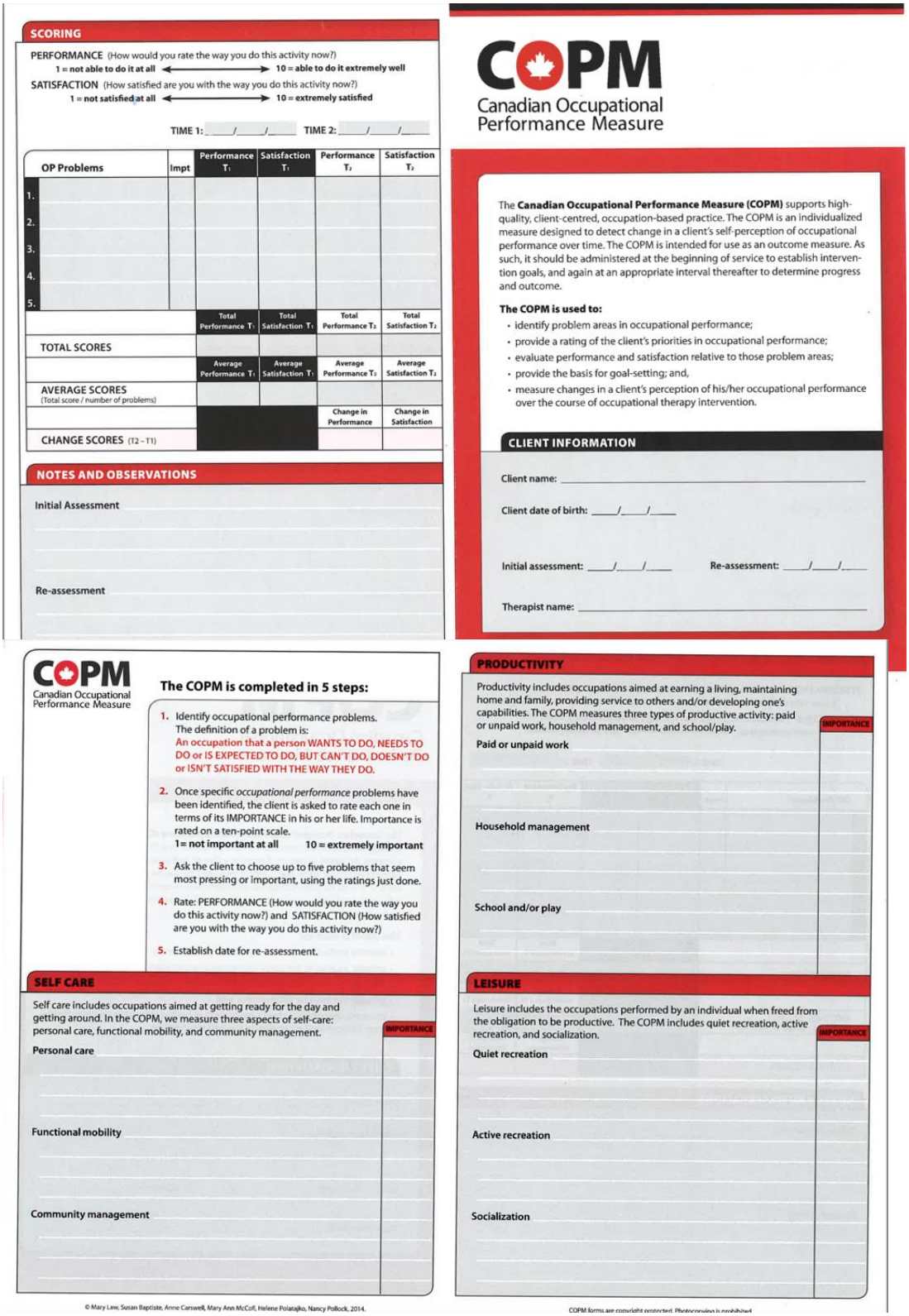
Over the last 6 weeks, you participated in a culinary program targeting improvement in hand function, kitchen safety and nutrition. Please indicate your level of satisfaction of the culinary program you took part in.

Overall satisfaction

	(1) Not at all Satisfied	(2) Slightly Satisfied	(3) Neutral	(4) Very Satisfied	(5) Extremely Satisfied
Program Location	○	○	○	○	○
Time the program was held	○	○	○	○	○
Information given throughout	○	○	○	○	○
Recipes made	○	○	○	○	○
Personal improvement in hand function	○	○	○	○	○
Support from therapists	○	○	○	○	○
Class environment	○	○	○	○	○
Instructions for all activities	○	○	○	○	○
Overall enjoyment	○	○	○	○	○

Appendix 4: Standardized Assessments

(Law et al., 2019)



SCORING

PERFORMANCE (How would you rate the way you do this activity now?)
1 = not able to do it at all ⟷ 10 = able to do it extremely well

SATISFACTION (How satisfied are you with the way you do this activity now?)
1 = not satisfied at all ⟷ 10 = extremely satisfied

TIME 1: ____/____/____ TIME 2: ____/____/____

OP Problems	Impt	Performance T_1	Satisfaction T_1	Performance T_2	Satisfaction T_2
1.					
2.					
3.					
4.					
5.					
		Total Performance T_1	Total Satisfaction T_1	Total Performance T_2	Total Satisfaction T_2
TOTAL SCORES					
		Average Performance T_1	Average Satisfaction T_1	Average Performance T_2	Average Satisfaction T_2
AVERAGE SCORES (Total score / number of problems)					
				Change in Performance	Change in Satisfaction
CHANGE SCORES (T2 – T1)					

NOTES AND OBSERVATIONS

Initial Assessment

Re-assessment

COPM
Canadian Occupational Performance Measure

The **Canadian Occupational Performance Measure (COPM)** supports high-quality, client-centred, occupation-based practice. The COPM is an individualized measure designed to detect change in a client's self-perception of occupational performance over time. The COPM is intended for use as an outcome measure. As such, it should be administered at the beginning of service to establish intervention goals, and again at an appropriate interval thereafter to determine progress and outcome.

The COPM is used to:

- identify problem areas in occupational performance;
- provide a rating of the client's priorities in occupational performance;
- evaluate performance and satisfaction relative to those problem areas;
- provide the basis for goal-setting; and,
- measure changes in a client's perception of his/her occupational performance over the course of occupational therapy intervention.

CLIENT INFORMATION

Client name: _____

Client date of birth: ____/____/____

Initial assessment: ____/____/____ Re-assessment: ____/____/____

Therapist name: _____

COPM
Canadian Occupational Performance Measure

The COPM is completed in 5 steps:

1. Identify occupational performance problems.
   The definition of a problem is:
   An occupation that a person WANTS TO DO, NEEDS TO DO or IS EXPECTED TO DO, BUT CAN'T DO, DOESN'T DO or ISN'T SATISFIED WITH THE WAY THEY DO.
2. Once specific *occupational performance* problems have been identified, the client is asked to rate each one in terms of its IMPORTANCE in his or her life. Importance is rated on a ten-point scale.
   1= not important at all **10 = extremely important**
3. Ask the client to choose up to five problems that seem most pressing or important, using the ratings just done.
4. Rate: PERFORMANCE (How would you rate the way you do this activity now?) and SATISFACTION (How satisfied are you with the way you do this activity now?)
5. Establish date for re-assessment.

SELF CARE

Self care includes occupations aimed at getting ready for the day and getting around. In the COPM, we measure three aspects of self-care: personal care, functional mobility, and community management.

IMPORTANCE

Personal care

Functional mobility

Community management

PRODUCTIVITY

Productivity includes occupations aimed at earning a living, maintaining home and family, providing service to others and/or developing one's capabilities. The COPM measures three types of productive activity: paid or unpaid work, household management, and school/play.

IMPORTANCE

Paid or unpaid work

Household management

School and/or play

LEISURE

Leisure includes the occupations performed by an individual when freed from the obligation to be productive. The COPM includes quiet recreation, active recreation, and socialization.

IMPORTANCE

Quiet recreation

Active recreation

Socialization

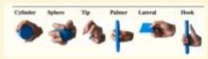
Appendix 5: Culinary Care Weekly Schedule

WEEK 1

"THE FOOD YOU EAT CAN BE EITHER THE SAFEST AND MOST POWERFUL FORM OF MEDICINE OR THE SLOWEST FORM OF POISON." -ANN WIGMORE

SCHEDULE
-Introduction
-Hand out materials
-Nutrition overview
-Introduce recipe
-What's the Why?
-COOK!
-Eat!

ESSENTIAL SKILLS/MOVEMENTS
- Functional Grips



- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

Sandwiches
Ingredients
- Bread
- Tomatoes
- Lettuce
- Onions
- Mayo and Mustard
- Turkey
- Cheese

Smoothies
Ingredients
- Fruits and veggies
- Milk
- Ice
- Chia seeds
- Protein powder
- Peanut butter

MATERIALS NEEDED
- Built up handle
- rocker knife
- blender
- can opener

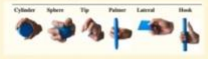
PERSONAL NOTES

WEEK 2

"TAKE CARE OF YOUR BODY. IT'S THE ONLY PLACE YOU HAVE TO LIVE." -JIM ROHN

SCHEDULE
-Introduction
-Take Measurements
-Hand out materials
-Nutrition overview
-Introduce the recipe
-What's the Why?
-COOK!
-Eat!

ESSENTIAL SKILLS/MOVEMENTS
- Functional Grips



- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

Veggie Salad
Ingredients:
- Cucumber
- Tomato
- Onion
- Carrots
- Chickpeas
- Feta/goat cheese

Fruit Salad
Ingredients:
- Apples
- Pears
- Oranges
- Grapes
- Strawberries

MATERIALS NEEDED
- Built up handle
- Press top chopper
- rocker knife
- rubber mat for plate

PERSONAL NOTES

WEEK 3

SCHEDULE
-Introduction
-Take Measurements
-Hand out materials
-Nutrition overview
-Introduce recipe
-What's the Why?
-COOK!
-Eat!

ESSENTIAL SKILLS/MOVEMENTS
- Functional Grips

- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

Charcuterie board
Ingredients
- Cheeses
- Fruits
- Jams
- Crackers
- Meats

MATERIALS NEEDED
- Built up handle
- rocker knife
- Rubber jar opener

PERSONAL NOTES

WEEK 4

SCHEDULE
-Introduction
-Hand out materials
-Nutrition overview
-Introduce recipe
-What's the Why?
-COOK!
-Eat!

ESSENTIAL SKILLS/ MOVEMENTS
- Functional Grips

- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

Build your own pizza
Ingredients
- Dough
- tomato sauce
- veggies
- cheeses
- meats

MATERIALS NEEDED
- Built up handle
- Press top chopper
- rocker knife
- rubber mat for plate
- air fryer

PEROSONAL NOTES

WEEK 5

SCHEDULE
-Conclusion of program
-Group discussion
-Hand out materials
-Introduce recipe
-What's the Why?
-COOK!
-Eat!
-Take measurements
-Post program surveys

ESSENTIAL SKILLS/ MOVEMENTS
- Functional Grips

- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

Banana bread
Ingredients
- Flour
- Oil
- water
- Eggs
- Bananas
- Zucchini
- Chocolate

Zucchini bread
Ingredients
- Flour
- Oil
- water
- Eggs
- Bananas
- Zucchini
- Chocolate

MATERIALS NEEDED
- Built up handle
- Grater
- rocker knife
- air fryer

PEROSONAL NOTES

WEEK 6

SCHEDULE
-Introduction
-Hand out materials
-Nutrition overview
-Introduce recipe
-What's the Why?
-COOK!
-Eat!

ESSENTIAL SKILLS/ MOVEMENTS
- Functional Grips

- Bilateral Coordination
- Dexterity
- finger and wrist strength
- Range of motion

RECIPE

MATERIALS NEEDED
- Built up handle
- Press top chopper
- rocker knife

PERSONAL NOTES

Appendix 6: Grip Strength Norms

(*Grip Strength Dynamometer Norms*, n.d.)

HANDEXER DYNAMOMETER

Typical Grip Strength for Healthy Individual

AGE	MALE			FEMALE		
	Weak	Normal	Strong	Weak	Normal	Strong
10-11	<27.8	27.8-49.4	>49.4	<26.0	26.0-47.6	>47.6
12-13	<42.8	42.8-68.8	>68.8	<32.2	32.2-53.8	>53.8
14-15	<62.8	62.8-97.7	>97.7	<34.2	34.2-60.2	>60.2
16-17	<71.9	71.9-115.5	>115.5	<37.9	37.9-63.9	>63.9
18-19	<78.7	78.7-122.4	>122.4	<42.3	42.3-68.3	>68.3
20-24	<81.1	81.1-124.8	>124.8	<47.4	47.4-77.8	>77.8
25-29	<83.1	83.1-126.8	>126.8	<56.4	56.4-91.3	>91.3
30-34	<79.4	79.4-123.0	>123.0	<47.4	47.4-77.8	>77.8
35-39	<78.9	78.9-122.6	>122.6	<44.8	44.8-75.2	>75.2
40-44	<78.3	78.3-121.9	>121.9	<41.7	41.7-72.1	>72.1
45-49	<76.5	76.5-120.2	>120.2	<41.0	41.0-71.4	>71.4
50-54	<72.5	72.5-111.8	>111.8	<39.9	39.9-70.3	>70.3
55-59	<67.7	67.7-106.9	>106.9	<39.0	39.0-69.4	>69.4
60-64	<66.6	66.6-105.8	>105.8	<37.9	37.9-68.3	>68.3
64-69	<62.2	62.2-97.0	>97.0	<34.0	34.0-60.0	>60.0
70-99	<47.0	47.0-77.4	>77.4	<32.4	32.4-54.0	>54.0