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A Quasi-Experimental Pilot Study Examining the Effects of Occupation-Based Hand Therapy on Clients with Hand Injuries in Occupational Therapy Practice in the Eastern Cape, South Africa

By

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Submitted in fulfilment of the requirements for the MSc. Occupational Therapy in the Faculty of Community and Health Sciences, Department of Occupational Therapy at the University of the Western Cape

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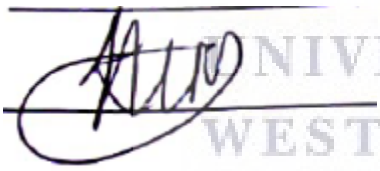
DECLARATION

I, Kayla Nero, declare that the work on which this dissertation **"A Quasi-Experimental Pilot Study Examining the Effects of Occupation-Based Hand Therapy on Clients with Hand Injuries in Occupational Therapy Practice in the Eastern Cape, South Africa"** is based on my original work, except when acknowledgements and references indicate otherwise. This dissertation is being submitted for an MSc OT Degree in the Faculty of Community and Health Sciences, Department of Occupational Therapy at the University of the Western Cape.This work has never been submitted as a part of, or in full, to any other university for examination.

Kayla Nero

Date: October 23, 2020



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The process of writing the thesis on a quasi-experimental pilot study examining the effects of occupation-based hand therapy in improving and managing hand injuries within occupational therapy has been a peculiar and intuitive journey for me as a MSc. Occupational Therapy student. Without the assistance and support of the following people and departments, this journey would not have been possible.

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ABSTRACT

Background: Occupation-based hand therapy (OBHT) is an approach to practice that integrates multiple frames of reference while remaining rooted in an occupational therapy perspective. Hand function is important for participation in daily occupations. The current focus in assessment and treatment of clients in occupational therapy remains on body structure and function which is also true in South Africa. The gap in the literature about the effects of OBHT indicates that there is a need for a study in a South African context. This research was conducted to examine the influences of an OBHT among clients with hand injuries within occupational therapy practice in a South African context. **Methodology:** In this study, a pragmatism paradigm and an embedded mixed method has been used to obtain a better understanding of the research phenomenon. This study has employed a one-group pre-test- post-test quasi-experimental research design. The setting that the study has taken place is at Nelson Mandela Academic Hospital in Mthatha with a convenient sample size of 25 patients. The data gathering methods that were utilized in the study was the Michigan Hand Outcomes Questionnaire, Disabilities of the Arm, Shoulder and Hand Questionnaire, joint range of motion assessment, questions relating to the participants' engagement in occupations, observations and medical notes. Data were analysed using the Statistical Package Social Sciences program, which has been used to compute the descriptive statistics frequencies, mean, and standard deviations. The questions relating to the participants' engagement in occupations, observations and medical notes have formed a part of the qualitative data analysis. Thematic analysis has been used to analyse the qualitative data. **Results:** The results reveal that motor skills, as well as the quality of life among clients with hand injuries, has improved after attending occupational therapy, which consisted of OBHT. Based on the results, enhancement in caring for oneself had been noted and the average participant felt more capable, confident and useful regarding their arm, shoulder or hand problem at the end of the intervention. **Conclusion:** The health conditions that were experienced by all the participants were various hand injuries including tendon injuries, nerve injuries, lacerations, amputations, arthritis, carpal tunnel syndrome and fractures. The participants experienced improvement after attending the OBHT. Recommendations of the results and future research directions are also presented.

KEY WORDS

Occupation-based Hand therapy

Hand injuries

Occupational therapy

Quasi-experimental

Pilot study

Biomechanical model

Occupation adaption model

ICF

South Africa, Eastern Cape

Nelson Mandela Academic Hospital

INTERPRETATIONS OF KEY ITEMS

Occupation-based: The term occupation-based therapy within occupational therapy is “a client-centred intervention in which the OT practitioner and client collaboratively select and design activities that have specific relevance or meaning to the client and support the client’s interest, needs, health, and participation in daily life” (Schindler, 2010).

Hand therapy: The term hand therapy in this paper refers to a type of rehabilitation executed by an occupational therapist on patients with disorders or conditions involving the hands and upper extremities (American Society for Surgery of the Hand, 2014).

Treatment approach: Treatment approach is defined as an intervention technique, which is a specific treatment method, used by occupational therapy practitioners to facilitate activities (Latham, Jette, Coster, Richards, Smout, James, Gassaway & Horn, 2006).

Improve: Enhancement or to make better (Graff, Vernooij-Dassen, Zajec, Olde-Rikkert, Hoefnagels & Dekker, 2006).

Hand injuries: Injuries to the hand and wrist. Neglect of such injuries may cause irreparable damage to the hand or wrist (McCue, Hugh Baugher, Kulund & Gieck, 1979)

Hand functioning: Hand functioning allows for individuals to perform several manual activities with their hands. Increasing hand function will improve the capacity to manage activities in daily life (Arnould, Bleyenheuft & Thonnard, 2014).

LIST OF ACRONYMS

ADLs: Activities of daily living

ANC: African National Congress

AOTA: American Occupational Therapy Association

AROM: Active range of motion

CEO: Chief Executive Officer

CTS: Carpal tunnel syndrome

DASH: Disability of the Arm, Shoulder and Hand

DIP: Distal interphalangeal

FCU: Flexi carpi ulnaris

IADLs: Instrumental activities of daily living

ICF: International Classification of Function

JROM: Joint range of motion

M: Mean

MCP: Metacarpophalangeal

MHQ: Michigan Hand Outcomes

NMAH: Nelson Mandela Academic Hospital

OA: Osteoarthritis

OBHT: Occupation-based hand therapy

OBI: Occupation-based intervention

OPD: Outpatient department

POPI ACT: Protection of Personal Information Act

PROM: Passive range of motion

ROM: Range of motion

SASHT: South African Society of Hand Therapist

SD: Standard deviation

SPSS: Statistical Package of the Social Sciences

STATS SA: Statistics South Africa

TV: Television

TVET: Technical and Vocational Education and Training

UWC: University of the Western Cape

WFOT: World Federation of Occupational Therapist

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CHAPTER ONE

INTRODUCTION

This chapter provides the background of the study, problem statement, research question, aim of the study, objectives of the study, significance as well as the outline of the study. The purpose of chapter one in the study is to guide the reader as well as to aid the reader with the understanding of why this thesis topic was explored and conducted.

1.1 BACKGROUND OF THE STUDY

One of the significant discussions in the field of occupational therapy and hand therapy is occupation-based hand therapy (OBHT) approach that is used. OBHT plays an essential role in the management of hand injuries using remediation approach in occupational therapy practice (de Klerk et al., 2016; Meier, 2019). Therefore, it is important to understand the influence of OBHT in clients with hand injuries and their outcomes. Roll and Hardison (2017) argued that occupational therapy practitioners are key health care providers for people with musculoskeletal disorders of the distal upper extremity.

It has been highlighted that OBHT values the influence of occupational engagement and participation in diverse occupations to restore function in the injured hand in order to enable clients to return to their day-to-day activities without challenges (Che Daud, Yau, Barnett, Judd, Jones & Muhammad Nawawi, 2015; South African Society of Hand Therapists [SASHT], 2015). For instance, recent studies on the importance of OBHT indicate that integration of OBHT as part of hand injury rehabilitation; physical agent modalities and therapeutic exercises tend to enhance clients' outcomes (De

Klerk, Badenhorst, Buttle, Mohammed & Oberem, 2016; Che Daud et al., 2015; SASHT, 2015). Therefore, it should be noted that an occupation-based approach does not contradict the impact and role of the biomechanical frame of reference, but instead encourages the use of occupation as a framework within which biomechanical approaches should be used (de Klerk et al., 2016). These studies accentuate the importance of incorporating occupations together with biomechanical approaches and principles in addressing the restrictions to participation that appeared to be the result of hand injuries. This implies that occupational therapists need to consider occupations as part of hand therapy.

A range of occupational therapy modalities and techniques tend to be used in the biomechanical approach, which includes splinting and physical agent modalities. However, it appears that the principal emphasis of current occupational therapy assessment and treatment for the clients with hand injuries remains on body structure and function, which is also a true reflection occupational therapy practice in a South African context (de Klerk et al., 2016). According to the South African Society of Hand Therapists (SASHT) (2015), hand therapy is considered as "…the art and science of rehabilitation of the upper limb - from the shoulder to the hand" (home page). What is not yet clear is the influence of OBHT on clients with hand injuries in the South African context. However, little is known about the combination OBHT and other familiar modalities in the therapy of clients with hand injuries.

Previous studies indicate that individuals who sustained hand injuries tend to struggle with their daily occupations (Che Daud, Yau, Barnett & Judd, 2016; Che Dau et al., 2015). This indicates that hand injuries are the most conditions, which appear to

influence individuals' occupational performance in their areas of occupation comprise basic activities of daily living (ADLs), instrumental activities of daily living (IADLs), rest and sleep, play, education, leisure as well as social participation (American Occupational Therapy Association, 2014). There are different types of hand injuries (i.e., accidents, violence, trauma, falls, human bites, mechanical, thermal, chemical, degenerative lesions, overuse or so forth) that influence engagement in areas of occupation (Che Daud et al., 2016; Mennen & Velze, 2008). Carter, Robinson, Chang and Kraft (2000) found that injuries and diseases of the upper limbs tend to have an association with disability and economic cost. However, in the literature on hand injuries, the relative importance of occupational therapy assessment and treatment has been subject to considerable debate because of its focus on body structure and function within a South African context (de Klerk et al., 2016).

1.2 PROBLEM STATEMENT

OBHT plays a vital role in hand rehabilitation of the clients with upper limbs, including hand injuries (Roll & Hardison, 2017). However, to the best of the authors' knowledge, to date few studies have explored the effects of OBHT in individuals with upper limbs conditions that involve bone, joint, general hand disorders; peripheral nerve disorders; and tendon disorders (Roll & Hardison, 2017; de Klerk et al., 2016). It has been highlighted that the hand rehabilitation of the upper limbs tends comprised splinting, positioning, exercises, engagement in activities and hand therapy (Burley, Di Tommaso, Cox & Molineux, 2018; Case-Smith, 2003; Taylor & Humphry, 1991). Roll and Hardison (2017) found that the most common treatment for conditions within the bone, joint, and general hand disorders; peripheral nerve disorders; and tendon disorders, consist of early active motion protocols and splinting. However it was found that the following protocols and their variations were found to be beneficial in

rehabilitation: passive flexion and active extension protocols (Kleinert type protocols), controlled passive motion protocols (Duran type protocols), a mixture of the Kleinert and Duran protocols, and early active motion protocols (Chesney, Chauhan, Kattan, Farrokhyar & Thoma, 2011). The application of an occupation-based method nurtures an insight and gratitude of the effect of the hand injury on the person, their activity and participation requirements and aims, within their environment (de Klerk et al., 2016). Although some research has been carried out on hand therapy, there have been few empirical investigations into the effects of OBHT within the South African context. This resonates with de Klerk et al.'s (2016) suggestion that occupational therapists should explore the influence of OBHT in relation to physical and psychological recovery. It is envisaged that OBHT could assist in improving and managing hand injuries within occupational therapy practice. In addition, the study could contribute the International Classification of Function (ICF) framework, which incorporates the health condition, the body functions and structures, restriction in activities, and limitations in participation in roles and occupations (World Health Organization, 2002; Case-Smith, 2003). Occupational therapy aims to promote maximal independence with treatment. The key goal therefore, is maximal participation in occupations of the clients' choice. de Klerk et al. (2016) state the domains of activity and participation are the fundamentals of occupational therapy services, and it is consequently our responsibility as occupational therapists to make certain that hand therapy practice is occupation-based. My angle on this matter is therefore to promote the use of occupation-based practice within therapy, which will identify whether OBHT helps in improving the outcome of hand injuries and the management thereof. The results of the findings will then aid other therapists to make informed decisions within hand

therapy practice. There are relatively few research studies on OBHT in practice to improve and manage hand injuries. However, studies on OBHT are rare to find in literature. So far, however, there has been little discussion about the use of OBHT in a South African context. Roll and Hardison (2017) states that very limited studies have explored occupation-based interventions in conditions within bone, joint, and general hand disorders; peripheral nerve disorders; and tendon disorders of the distal upper extremity. Amini (2011) conducted a study on the effectiveness of occupational therapy treatment approaches in rehabilitation of persons with work-related forearm, wrist, and hand injuries and her findings revealed that the utilisation of occupation-based activities has reasonable yet restricted evidence to defend its effectiveness. de Klerk et al., (2016) states that there is a necessity to explore OBHT to explore the relationship between physical and psychological recovery as well as the legitimacy of using the approach to enhance the quality of life.

1.3 RESEARCH QUESTION

Does occupation-based hand therapy improve hand functioning in areas of occupation among clients with hand injuries?

1.4 AIM

The aim of the study was to examine the influences of OBHT in hand functioning with regards to areas of occupation among clients with hand injuries within occupational therapy practice in a South African context.

1.5 OBJECTIVES OF THE STUDY

The objectives of the present thesis are:

- To describe the participants' socio-demographic characteristics
- To assess whether OBHT has effects on hand functioning (motor skills) among clients with hand injuries
- To explore influences of OBHT on hand functioning which directly relates to the quality of life of clients with hand injuries

1.6 SIGNIFICANCE

The purpose of this embedded mixed method was to examine the effects of OBHT among clients with hand injuries. The study has provided evidence to advance occupational therapists' knowledge of OBHT in the management of individuals with hand injuries in occupational therapy practice. The contribution of this study is evident, as the resulting outcomes can be capitalized as guidelines to treat hand injuries in occupational therapy. In addition, the findings should make an important contribution to the field of hand therapy in a South African context.

It is envisaged that the study about OBHT will provide evidence and information needed for improvement and management of hand injuries within occupational therapy in a South African context. This will aid the profession of Occupational Therapy with suggestions of different treatment approaches and guidance on making an informed clinical decision in practice. The terms evidence-based practice, research application, and knowledge conversion accentuate the formation, discussion, and utilisation of information from research findings and other sources, together with co-workers,

clinical experience, books, and clients, to encourage a shift in practice and advise clinical decision making (Thomas & Law, 2013).

1.7 OUTLINE OF THE STUDY

CHAPTER ONE: INTRODUCTION

This chapter provides an overview of OBHT, the biomechanical approach, as well as an understanding of hand rehabilitation within a South African context. The background of the study, problem statement, research question, aim of the study, objectives of the study, and significance is also discussed in this chapter.

CHAPTER TWO: LITERATURE REVIEW

This chapter provides a detailed explanation of hand rehabilitation, hand injuries, occupations, OBHT, as well as the theoretical framework used. A comprehensive description of the outcome measures used is also contained within this section.

CHAPTER THREE: METHODOLOGY

The methodology includes the research paradigm, research approach and the research design. In addition, the study setting, participant selection and recruitment, as well as the data collection tools and methods used to collect the data for the study, are included. The section also gives an overview of the data gathering procedure, the process of data analysis, and the validity and reliability. The ethical implications related to the study have been included in this section.

CHAPTER FOUR: RESULTS

This chapter presents the results of the study, including the demographics, outcome measures, correlations of the outcome measures, as well as the qualitative results.

CHAPTER FIVE: DISCUSSION

This chapter delivers an interpretation of the results, including the incorporation of these findings with literature. The attainment of the research objectives is also discussed in this chapter.

CHAPTER SIX: CONCLUSION

The concluding chapter summarises all previous chapters, presents the most significant and crucial developments, and provides recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2 INTRODUCTION

The previous chapter covered the background of the study, and the second chapter presents the procedure followed to review and access the literature for this study. Therefore, chapter two deals with the literature related to hand injuries. Furthermore, the reviewed literature comprises the influences of hand injuries on quality of life, health and well-being, hand therapy and rehabilitation, the importance of occupations in occupational therapy, and OBHT. Additionally, the theoretical frameworks and models, as well as the outcome measures that guided the current study, are covered.

2.1 PROCEDURE FOR LITERATURE REVIEW

Concerning the procedure for the literature review, the researcher was guided by the problem statement, research question, aim and objectives of the study. The researcher used the google scholar, and the UWC library to access the search engines to acquire published journal articles and books. The keywords (i.e., occupation-based hand therapy; hand injuries; occupational therapy; quasi-experimental; pilot study; biomechanical model; occupation adaption model; ICF; South Africa, Eastern Cape; Nelson Mandela Academic Hospital) of the study were used in the search engines.

2.2 HAND INJURIES

In elucidating hand injuries, there are six general categories of hand injuries that affect the hands and upper limbs of individuals. There are different types of hand injuries comprising of lacerations, fractures and dislocations, soft tissue injuries and amputations, infections, burns and high pressure (Tarr & Davis, 2019). According to Carter et al. (2000), injuries and diseases of the upper limbs have a considerable influence on the population because of their high frequency of occurrence, which results in most circumstances association with disability and economic cost. It has been discovered that the forearm and hand are part of the defensive mechanism, often extended to absorb the influence of the trauma, with a slight preference for the dominant hand (Carter et al., 2000). Concerning the current study, the hand injuries and conditions that influence upper limbs included traumatic injuries, which consists of burns, lacerations, fractures, amputations, crushing injuries, and cumulative trauma disorders, such as tenosynovitis, carpal tunnel syndrome (CTS), and osteoarthritis (OA). Additionally musculoskeletal conditions which consist of injuries to muscles, tendons, joints, cartilage, and nerves were considered.

A laceration is a wound that is created by the ripping of soft body tissue (Sharkey & Fanton, 1998). This sort of wound is frequently asymmetrical and rough. A laceration wound is frequently tainted with bacteria and debris from whatsoever object produced the cut. Lacerations may be produced by injury with a piercing entity or by impact injury from a blunt object or force (Abdelazim, 2015)).

A burn is damage to the body's tissues instigated by electricity, chemicals, heat, sunlight, or radiation. Injuries from hot liquids and steam, building fires and flammable liquids and gases are the most frequent reasons of burns (Srivastava & Durgaprasad, 2008). Burns are categorised as first-, second-, or third-degree, dependent on how

deep and severe they breach the skin's outside. First-degree burns (superficial) affect only the epidermis or external layer of skin. The burn location is red, agonising, dry, and with no swellings. Mild sunburn is an example. Long-term tissue injury is rare and usually consists of an increase or decrease in the skin shade (Palmieri & Greenhalgh, 2002). Second-degree burns (partial thickness) encompass the epidermis and part of the dermis layer of skin (Orgill, 2009). The burn location looks red, blistered, and might be swollen and tender. Third-degree burns (full-thickness) abolish the epidermis and dermis and might go into the subcutaneous tissue (Blais, Parenteau-Bareil, Cadau & Berthod, 2013). The burn location might look white or charred. Fourth-degree burns similarly damage the underlying bones, muscles, and tendons. There is on no account sensation in the location since the nerve endings are destroyed (Toon, Maybauer, Arceneaux, Fraser, Meyer, Runge & Maybauer, 2011).

A fracture is a broken bone (Wilson, 1976). It could array from a thin crack to a complete break. Bones could fracture crosswise, lengthwise, in several places, or into numerous pieces. Most fractures occur when extra force or pressure is directed to the bone than it can support. Therefore, fractures commonly result from car accidents, falls, or sports injuries (Court-Brown, Garg & McQueen, 2001). Other reasons include low bone density and osteoporosis, which results in weakening of the bones. In the condition that the broken bone ruptures the skin, it is called an open or compound fracture (Quinn & Macias, 2006).

A crush injury take place when force or pressure is exerted on a body part (Smith & Greaves, 2003). This kind of injury most frequently happen when part of the body is pressed between two heavy objects. If a body part is caught between two objects in

motion or under the influence of a high magnitude force, the body parts could be severely injured in the accident owing to the squeeze and rubbing.

Amputation is surgery to take out the entire or part of an arm or leg (Kim & Kim, 2012). It might be performed to heal or cure injury, disease, or infection. It might also be performed to eradicate tumours from bones and muscles. The most frequent motive for amputation is decreased blood flow (Miyajima, Shirai, Yamamoto, Okada & Matsushita, 2006). This occurs when arteries come to be narrowed or damaged. Other reasons one may require this procedure include injuries, for instance severe burn or accident, or cancer in a limb (Pooja & Sangeeta, 2013). Amputation might also be performed for severe infections that do not react to antibiotics or other treatment. In certain cases, it may be performed due to frostbite (Imray, Grieve, Dhillon & Caudwell, 2009).

Tenosynovitis, peritendinitis, and epicondylitis are soft-tissue diseases of the upper limb that are predominantly bothersome to people whose jobs entail and mandate dexterousness, persistent and strenuous use of the hands and upper limbs. Tenosynovitis is categorised as "repetition strain injury," which is a word used to describe and define several soft-tissue conditions of the upper limbs (Kurppa, Viikari-Juntura, Kuosma, Huuskonen & Kivi, 1991).

Hall, Lee, Fitzgerald, Byrne, Barton and Lee (2013), states that carpal tunnel syndrome, which is abbreviated as CTS, is the most frequent nerve entrapment. Carpal tunnel syndrome results from the median nerve being compressed in the carpal tunnel of the wrist and characteristically presents with paraesthesia in the thumb, index, middle, and radial half of the ring finger. Other signs and symptoms are inclusive

of disturbed sleeping patterns, pain, loss of functional grips, and reduced finger dexterity.

Osteoarthritis, which is abbreviated as OA, is a common disorder that is age-related, affects the joint range of motion and can cause deformity (Anderson & Loeser, 2010). OA is a chronic degenerative disease and considered by many to be an unavoidable result of growing old (Anderson & Loeser, 2010). Loss of the articular cartilage and degradation is a central feature and is on occasion attributed to “wear and tear” (Anderson & Loeser, 2010). OA is the most frequent joint disorder in the world and one of the most frequent foundations of pain and disability in the elderly. The hand is the appendicular joint most frequently affected by osteoarthritis in the ageing population (Anderson & Loeser, 2010). In their study, Sellam and Berenbaum (2013) argue that obesity; together with ageing and injury tend to be the main risk factors for osteoarthritis. Weight-bearing joints and the hands can be affected by obesity-related osteoarthritis (Sellam & Berenbaum, 2013). Current trends in literature highlight that osteoarthritis is a disease that can be distinguished grounded on the risk factors involved and the pathophysiological means fundamental to the joint damage which are considered as ageing, obesity, genetic factors, or injury (Sellam & Berenbaum, 2013).

When the median nerve is damaged at the wrist level, it results in paralysis of the thenar muscles, inability to abduct and pronate the thumb and a sensible insufficiency of the radial three and a half digits, which influence grip and pinch power. The hand displays an outwardly rotated thumb into the plane of the palm and a wasted thenar eminence. The median nerve is located precisely volar of the superficial flexor tendons and near to the radial artery. Related flexor tendon and vascular injury is frequent to median nerve injury (McAllister, Gilbert, Calder & Smith, 1996). An ulnar nerve injury

or traumatization is associated with significant sensory loss, profound weakness and an awkward hand. Sensation is absent over the dorsal side of the little finger and ulnar half of the ring finger. In proximal injuries, there is also sensory damage in the dorso-ulnar side of the palm. Moreover, the consequence of ulnar nerve paralysis is a severe muscle difference ruining the delicate mechanical structure of the hand and greatly affecting the grip function (Omer, 1988). Profound deficiencies happen in the 'intrinsic minus' hand with damage of the interossei, thenar, hypothenar, and adductor pollicis muscles. The look of the hand is indicative of the muscles comprised in the injury. The appearance of the digits of the hand will be as follows, the fourth and fifth fingers are hyperextended at the metacarpophalangeal (MCP) joint but in flexion at the distal interphalangeal (DIP) joint. The thumb is abducted and the second and third fingers are extended with slight flexion of the DIP joint. Grounded on their close association with the nerve, associated injury to the ulnar artery and the flexor carpi ulnaris (FCU) tendon is frequent (Kozin, Porter, Clark & Thoder, 1999). Below is a figure found in Jaquet (2004) illustrating the parts of the hands that are innervated by the median and ulnar nerves.

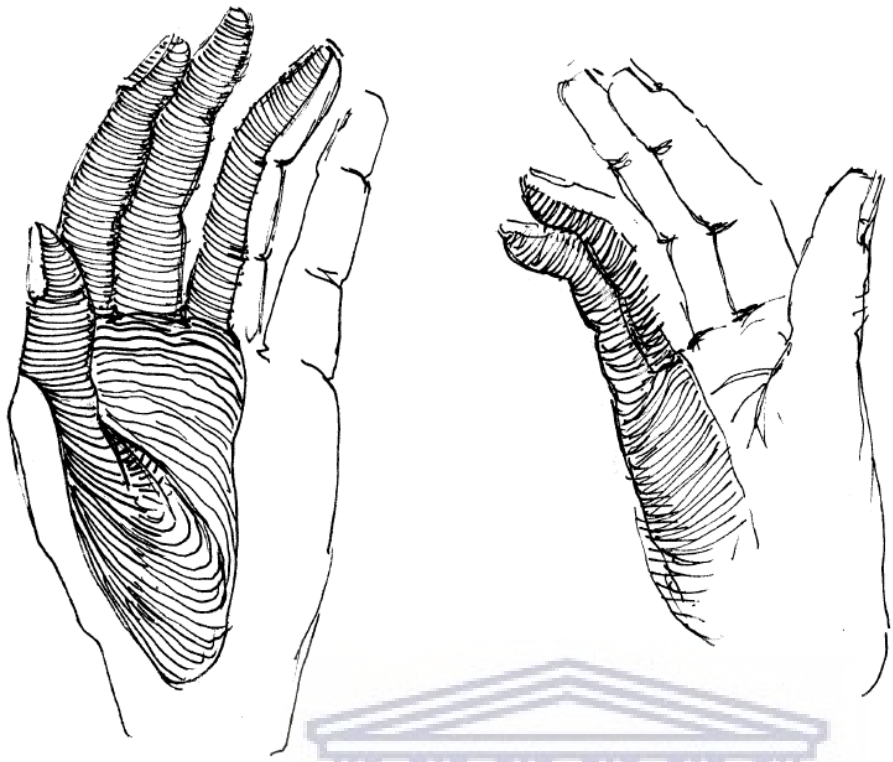


Figure 2. Sensory innervation by median nerve. **Figure 3.** Sensory innervation by ulnar nerve.

Figure 1: Parts of the hand that is innervated by the median and ulnar nerves

(Jaquet, 2004)

According to Kleinert and Verdan (1983), the radial nerve is also a joint sensory and motor nerve. The level of injury will indicate whether patients are incapable to extend the elbow joint, the wrist joint (dropping hand) and the fingers. This is also a incapacitating injury, as it results in a person not being able to flex the fingers adequately enough using their muscle strength to grip an object due to muscle difference. Sensory damage is essentially found on the dorsum of the hand and fingers (Kleinert & Verdan, 1983).

The extensor mechanism of the hand can be divided into eight zones which are shown in the figure below. The even-numbered zones are found over bones, and the odd-numbered zones are found over joints (Kleinert & Verdan, 1983).

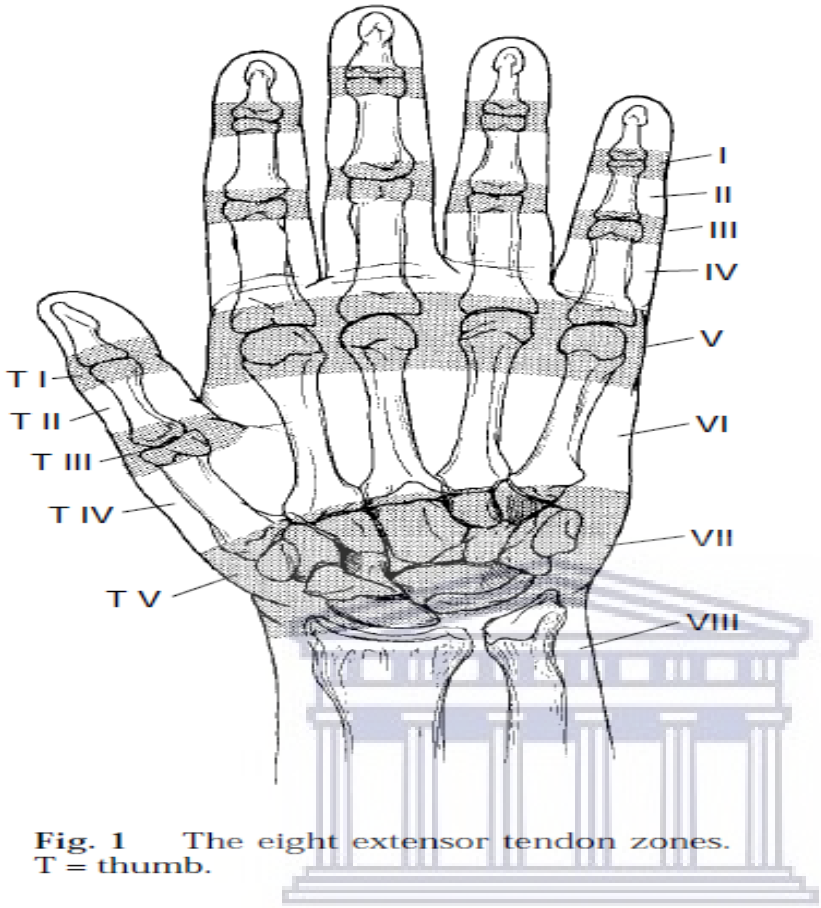


Fig. 1 The eight extensor tendon zones.
T = thumb.

Figure 2: Eight zones of the extensor mechanism (Newport, 1997)

Two-thirds of all extensor tendon injuries are related with concomitant injury to bone, skin, or joint. Dynamic splinting for extensor injuries has been found to advance outcomes compared with static splinting. A complete laceration or injury of the extensor tendon will inhibit full MCP extension. An incomplete extensor laceration could be excruciating or may present with incomplete MCP extension (Newport, 1997).

The most severe of all lesions of the peripheral nerves is a brachial plexus injury. Brachial plexus injuries are found to be common. According to Birch (2015), if surgeons refuse the habit of procrastination a high amount of patients can reach restoration of glenohumeral control, wrist extension and elbow flexion,

thoracoscapular control, with normal sensation within the median area of the hand and the relief of pain (Birch, 2015).

2.3 INFLUENCES OF HAND INJURIES ON QUALITY OF LIFE, HEALTH AND WELL-BEING

Occupational therapy was created in the early 20th century (Law, Steinwender & Leclair, 1998). Occupational therapy was aimed at using the method of participation and engagement in daily occupations to improve functioning and the health of soldiers who sustained injuries in World War I and with people with mental health disabilities. Law et al. (1998) found that the elimination of occupations results in decreased health, physiological changes and increased stress. Therefore, it is evident that everyday occupations are a vital part of everyday life ranging from functional to physiological outcomes. Withdrawal or changes in occupation for a person have a significant influence on a person's self-perceived health and well-being (Law et al., 1998). The World Health Organization states that participation has a positive effect on health and well-being (Law, 2002). Occupational therapy is fundamentally aimed at improving health and well-being through occupation. Studies have found that children with disabilities engage and participate in fewer household tasks, social engagements and active recreation activities than compared with children without disabilities. Adults and older adults with disabilities engage and participate in restricted participation occupations and social isolation and engage in more passive activities. Disability affects persistent engagement and participation in occupations in all age groups. An important link subsists between disability severity and social isolation. Disability and the presence thereof has been discovered to result in engagement and participation

in less varied occupations, includes less social relationship, is located more at home and includes fewer active recreation (Law, 2002).

Reilly (1962) discusses a core hypothesis "that man, through the use of his hands as energized by mind and will, can influence the state of his own health" which suggests an essential connection between occupation, engagement in occupation and health and well-being. Humans engage and participate in occupations which are self-directed and self-initiated that is beneficial to the person or contributes to others around them. These activities of daily living (ADL) are labelled by our culture as work, leisure, play, rest, creative recreations, and other ADL that enable us to adapt to environmental demands. Engagement in occupation enables humans to acquire experience. When a human is allowed to develop a skill, this can result in the humans affecting the state of their own health. Yerxa (1998) mentions that "the human spirit for occupation, developed through aeons of time in evolution, unfolding through development, and actualized through daily learning, needs to be nurtured to contribute to the health, quality of life, and survival of persons and society." Therefore, when a person (including those with impairments) is enabled with skills to assist them in engaging and participating in occupations, which are their valued goals in their environment, it would contribute to their health and well-being.

Hemmingsson and Jonsson (2005) discovered that the idea of participation has become a vital role in rehabilitation, health care and occupational therapy. Participation in occupations is the basis for occupational therapy. It is suggested that engagement and involvement in occupations are carefully connected to life satisfaction, health and human development. The connection is optimistic as meaningful occupations offer prospects for personal development, mastery, and for

satisfaction. The connection is pessimistic when it entails the person to face occupational risk factors such as occupational deprivation (Hemmingsson & Jonsson, 2005). Persson, Erlandsson, Eklund and Iwarsson (2001) argues that the purpose for engaging and participating in an occupation can be a source for meaning, however, at the same time the purpose can develop from the meaning one makes out of a situation. Spirituality is an important source for finding meaning. Engaging and participating in meaningful occupations results in more considerable therapeutic gains. Adding meaning to occupations was also found to improve performance (Persson et al., 2001). Ideal experiences in daily life importantly add to quality of life and meaning. Considering the meaning of an occupation as observed and perceived by the person, is vital for being able to shed light on the true nature of the occupation. Working is the main occupation for adults as it considered to be a basic part of everyday life; therefore, work is of vital importance for people to practice and achieve their identity. Work occupations assist in meeting social needs but also assist humans financially. Persson et al. (2001) describe work to be "production-focused occupations that have to be performed in order to support us, directly or indirectly, is classified as work occupations".

Work is essential for human beings, and often disability causes people not being able to return to their work which then harms their health and well-being. This also causes the individual to be faced with occupational deprivation. The elimination of occupations such as work and not engaging in work results in decreased health, physiological changes and increased stress. Bear-Lehman (1983) discusses that participation in occupations, level of ADL and financial need is closely linked to the return to work status. The human hand is carefully linked with caring for oneself and others independently and with adaptive skills, therefore, a hand injury may negatively impact

a person's life goals, the struggle for a better job, a person's financial security, and the happiness of the family (Bear-Lehman, 1983). The loss of hand function through injury may not only be terrifying but often establishes a predicament by intimidating economic security and ego. This also dramatically alters an individual's self-perception. An individual then requires adaptation to cope with the stress, endure the pain and to reconstruct a new self-image. The predictable insight would be that occupational therapy affects activities of daily living, which affect return to work (Bear-Lehman, 1983).

2.4 HAND THERAPY REHABILITATION

In explaining hand therapy, it is known that within hand therapy rehabilitation, the approaches for treatment include massage, sensory re-education, tendon gliding exercises, splints and therapeutic activities (Burley, Di Tommaso, Cox & Molineux, 2018; Case-Smith, 2003; Taylor & Humphry, 1991). Goats (1994) highlighted that therapists are concerned about encouraging healing, restoring normal function succeeding injury and achieving ideal performance of their clients.

In relation to massage, it has been found that massage tends to assist with the processes of arterial and venous blood flow, the blood clotting process, oedema, lymphatic drainage and the properties of connective tissue and muscle (Goats, 1994). Furthermore, massage is used to relieve pain and promote relaxation (Goats, 1994).

Concerning sensory re-education, rehabilitation techniques after nerve injury and repair include re-education of sensation of the hand, which involves specific sensory exercises (Dellon, Curtis & Edgerton, 1974). Kalron, Greenberg-Abrahami, Gelav, and Achiron (2013), state that the main beliefs of sensory re-education training comprise

of repeated presentation of directed intolerant tasks (examples of these are; defining weight and texture of materials or objects positioned in the affected hand); advancement from easy to more difficult intolerances; observant exploration of stimuli with blocked vision; and use of anticipation experiments and feedback on noticeable sensory features of the stimuli.

In describing tendon-gliding exercises, Wehbe (1987) states that tendon gliding exercises allow the flexor tendons to glide to their maximum potential, which can facilitate therapeutic activities. Tendon gliding exercises provides the maximum range of motion at each finger joint, which is beneficial for stiff hands.

Splinting is one of the modalities that are for treatment in hand injuries is accepted as standard practice for rehabilitation (Fess & McCollum, 1998). The single accessible therapeutic approach that directs controlled gentle forces to soft tissues for adequate periods of time to encourage tissue remodelling without triggering detrimental microscopic disruption of cellular structures (Fess & McCollum, 1998). Wise and correct utilisation of splinting methods as part of treatment intervention is crucial to attaining the most efficacious clinical results. The use of therapeutic activities is valuable in therapy in an occupational therapy perspective. Therapeutic activity compensates for disability by utilizing the residual abilities to complete desirable activities with acceptable results (Allen, 1987).

2.5 IMPORTANCE OF OCCUPATIONS IN OCCUPATIONAL THERAPY

In explaining the importance of occupation in occupational therapy, Nelson (1997) highlighted that the core technique of treatment in occupational therapy is occupation, which is considered as a therapeutic method. Furthermore, WFOT (2010) defines occupation as “everyday activities that people do as individuals, in families and with

communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to and are expected to do". The use of occupation in treatment have been implemented across the history of the profession as the common core but with different approaches and interventions. Nelson (1997) indicated that "our service of occupational therapy is so sound because the idea of therapeutic occupation is so basic: The human being can attain enhanced health and quality of life by actively doing things that are personally meaningful and purposeful, in other words, through occupation." Occupational therapists are unique in a way where they are determined to help people help themselves through their own active efforts. Occupation in the profession is considered to be the relationship between an occupational performance and an occupational form. Occupational performance is defined as the doing. Occupational form is defined as the process of doing something or the format of how it is done. Occupational performance and form can be objective and subjective. Objective as the occupational therapist can observe it. However, occupation also has subjective, experiential components that are not directly observable. Meaning and purpose are the subjective features of occupation. Meaning allows the person to interpret the occupational form actively. Occupation affects the world around the person; therefore, the effect is called impact. A person can alter their nature by engaging in an occupation, which is considered, as another dynamic of occupation. This process is called occupational adaptation. Active occupation, or doing, can result in changes in the person's cognitive abilities, sensorimotor abilities, and psychosocial abilities. Occupations challenge us to engage in constant adaptations that constitute life. The occupational therapy profession has confidence that a person has the ability to influence the quality of his or her life through occupation

(Nelson, 1997). Disability results in and has been found to lead to participation in less diverse occupations, which consists of fewer social relationships, occupations that are located more at home, and it includes less active recreation. Participation in occupations is the practice of how everyone searches for meaning in life (Law, 2002). 4There are differences between activity and occupation in the field of occupational therapy, which form part of the fundamental elements of the profession. Occupation is described as a person's individually created one-time experience within an exclusive context (Pierce, 2001). In contrast, activity is described as a more general, culturally shared idea about a category of action (Pierce, 2001). Occupational therapy defines occupation and activity as when being practised, it holds therapeutic power for recovery, and it gives meaning to human life. An occupation has a form, a rate, a beginning and an ending, a shared or individual characteristic, a cultural importance to the person, and an unlimited amount of other perceived contextual qualities (Pierce, 2001). Occupations are "things that people do to occupy life for an intended purpose, such as paid work, unpaid work, personal care, care of others, leisure, recreation, or subsistence" (Christiansen & Townsend, 2010, p. 421). Hocking (2005) defined occupations as the ordinary things people do in their everyday lives that occupy time and that safeguard survival, well-being, and adaptation to the environment. Therefore, occupational therapy emphasises on allowing and encouraging individuals and groups to partake and engage in everyday occupations that are important to them, provide fulfilment, and involve them in everyday life with others.

2.6 OCCUPATION-BASED HAND THERAPY

In occupational therapy, OBHT is considered as the use of occupations in therapy to improve patients' health and well-being (Amini, 2004). However, this core basis of occupational therapy has been absent in the treatment of patients in various settings

(Molineux, 2004). It was found that during the past years, the application of occupation-based approaches in hand therapy has been scarce due to the dominant biomedical approaches being applied in treatment (Toth-Fejel, Toth-Fejel & Hedricks, 1998). However, the biomedical approach and OBHT can be used together as the occupation-based approach certifies that the fundamental therapeutic aim for splinting remains that of enabling a patient with either current or future occupation other than just the regular providing of a splint (McKee & Rivard, 2004).

The core of occupational therapy is when an occupation is used as the fundamental approach in practice and includes both occupation as an intervention modality, as well as a the desired outcome of intervention. Hocking (2005) defined occupations as the conventional and unexpected things people do in their everyday lives that occupy time and that certify survival, well-being, and adaptation to the environment. Assessing a patient adequately, looking at the referral letter as well as any other data aids the occupational therapist and patient in developing strategies to meet the patients' demands and making therapy client-centred.

According to Schindler (2010), when occupational therapists work together with their patients to create or choose activities that have specific importance, relevance or meaning to the patient and that are constant with the patients' interests, participation in daily life, health-related goals, then the occupational therapist is essentially being client-centred. Occupational therapy has been described as "the therapeutic use of everyday life activities (occupations) with individuals or groups for the purpose of participation in roles and situations in home, school, workplace, community, and other settings" (AOTA, 2008, p.673). Occupational therapy is grounded on the focus on human engagement in appreciated occupations for promoting health and well-being.

Mulligan, White and Arthanat (2014) state that occupational therapists have a distinctive picture of their patients as occupational beings. Therefore, this allows the occupational therapist to comprehend the various ways that engaging in occupations positively influence health outcomes and aids an individual in achieving their potential (Mulligan et al., 2014). A study was conducted where the participants stated that they felt that occupation-based treatments were helpful as they naturally motivated and provided a sense of ownership and expertise in the occupations with which they are accustomed to (Colaianni & Provident, 2010). Occupation-based models have been established to direct and guide occupational therapy practice (Lee, 2010).

Occupational therapy uses occupation-based therapy or occupation-based intervention (OBI) to enable patients to reach their full range of enablement, to promote better occupational inclusion and justice as well as the use of occupations and activity for impairment reduction. American Occupational Therapy Association (AOTA, 2008), states that an OBI is a kind of occupational therapy intervention in which a client participates in a client-focused or centred occupations that are in line with identified goals. Occupation-based therapy does not indicate that a patient participates in occupations selected or directed by the patient who compliments their identified goals; however, occupation-based therapy indicates that therapy should enable the engagement in or performance of an occupation that a patient wants to, is expected, or needs to do. Occupation-based practice is complex and is aimed at the accommodation, health and well-being, impairment reduction, skill acquisition, adaptation, social reconstruction to allow for and result in improved occupational engagement or performance (Polatajko & Davis, 2012). OBHT is defined as a treatment approach that equalises or balances the worth of occupation as a therapeutic tool and the importance of upholding ordinary biomechanical principles

(Amini, 2004). OBI supports the core belief of occupational therapy as it allows the individual to participate in valued occupations (Amini, 2004). OBI is a combined, all-inclusive and client-centred approach to therapeutic practice, where the main goal is to achieve short and long term occupational goals established by the individual in combination with the therapist that replicate the individual's values, desires, wants and needs (Amini, 2004; Fitzpatrick & Presnell, 2004). OBI takes into an account an individual as an entirety, where their physical, cognitive, psychosocial, spiritual and environmental difficulties associated with their disorder or injury are focused in therapy (Amini, 2004). OBI is grounded on an examination of occupational factors that are causal to the onset and worsening of a condition, and re-engagement in occupations that an individual desires to do or needs to do is the chief aim of therapy (Grice, 2015; Doble & Santha, 2008; Fisher, 2014). The OBI treatment method also includes activity modifications as well as task and environmental adaptations to support people in adjusting to their performance restrictions (Preissner, 2010).

There are many benefits in using OBI as a means of a treatment approach in therapy as it is documented in the literature. The OBI treatment approach enables a holistic method; it facilitates individuals to achieve their functional goals and conserves their life roles (Amini, 2011). Subsequently, this improves their well-being in terms of physical, social, psychological, emotional and occupational (Doble & Santha, 2008; Colaianni & Provident, 2010). Allowing individuals to participate in their daily occupations also generates a feeling of autonomy, enjoyment, accomplishment and self-determination during their entire treatment process (Fisher, 2014; Hemmingsson & Jonsson, 2005).

The OBI process is made up of three aspects. According to Shea and Jackson (2014), an OBI uses occupation during the entire course of the occupational therapy therapeutic process of (1) assessment, (2) intervention, and (3) measurement of outcome.

(1) Occupation-based assessment and goal setting

The assessments that the current study incorporates are the Michigan Hand Outcomes Questionnaire, Disability of the Arm, Shoulder and Hand, demographic information, joint range of motion screening and questions relating to the participants' engagement in occupation. The outcome measures were aimed at finding information on the participants' ability to engage in ADL's, recreational activities, social activities, pain, work, sports and musical instruments. According to Kitis, Celik, Aslan and Zencir (2009), the DASH consists of two components: the function, symptom, social role component and the optional high-performance sport/music or work component.

According to Horng, Lin, Feng, Huang, Wu and Wang (2010), the MHQ is a questionnaire comprised of a total of 70 –item Likert scale precisely associated to the hand that is characterised below the following six domains: (1) overall hand functioning; (2) activity of daily living; (3) pain; (4) work performance; (5) aesthetics; and (6) patient satisfaction with hand functioning.

The demographic information was obtained to find out general information on the participants of the study. The questions relating to the participants' engagement in occupation was aimed at finding out which occupations the participants took part in before and after their injuries, how well they participated in these occupations as well as what caused their health condition (hand injuries). This, however, led to the researcher obtaining information on the participants' meaningful occupations, which

were disrupted by their hand injuries. This process assisted in goal setting based on the findings of the assessments.

In accordance with the ICF, assessments ought to always be client-centred, functionally oriented and occupationally directed (Grice, 2015). Assessment of performance should be practically assessed in all features of the individuals' life comprising of their personal management, work, leisure, as well as their rest/sleep activities (Grice, 2015). Sequentially, to obtain a precise understanding of occupational performance, the assessment ought to be done by observing the individual engage in their daily tasks within their physical and social contexts (Grice, 2015; Law, 2002). Furthermore, this assists the therapist to recognise and find resources that are obtainable within the individuals' context, and which resources could be used during the intervention process (Fisher, 2014).

During the process of assessing occupations, it is essential for the therapist to look into all the fundamental internal and external elements such as personal, bodily and environmental elements that are either strengthening or restricting performance (Fisher, 2014). Therefore, in turn for the assessment to be client- centred, the patient as well as their family should acknowledge strengths and difficulties associated with occupational performance, and information collected from the assessment should explain the contextual elements that affect this performance (Grice, 2015). However, after the assessment of occupational performance is accomplished, the therapist works closely together with the patient to detect and highlight occupational goals that they would like to address in the intervention (Fisher, 2014). The therapist ought to support and nurture the individual as much as possible to focus on a range of problems

within their self-care, work and leisure occupations in order for a balance of occupation to be achieved (Doble & Santha, 2008).

(2) Occupation-based intervention

Generally, the aim of treatment when involving an OBI approach is for the individual to be engaged in meaningful occupations which leads to the individual experiencing a sense of well-being (Fisher, 2014; Doble & Santha, 2008). Participation and engagement in occupation are also the therapeutic means that is utilized to obtain this goal (Fisher, 2014). During the intervention stage, therapists should practice theories labelled by four models, namely the compensatory, educational, acquisitional and restorative model, sequentially to improve therapeutic outcomes (Fisher, 2014). Daud, Yau, Barnett, Judd, Jones and Nawawi (2016) stated that involvement and participation in daily occupations and day to day activities aids in restoring function in individuals with injured hands and offers a program to practise selected meaningful occupations. Cederlund, Ramel, Rosberg and Dahlin (2010) states that following a hand injury, the patients might experience complications to perform daily occupations, decreased hand function, and reduced health-related quality of life. Occupational well-being is improved when individuals' occupational requirements, including their requirements for agency, affirmation, accomplishment, coherence, companionship, pleasure, and renewal, are met continuously. Occupational therapists can play an important role in facilitating clients to create or re-orchestrate their occupational lives, so they are capable to meet their occupational needs more constantly (Doble & Santha, 2008). Hannah (2011) states that timely involvement and independence in meaningful activities certifies that significant roles are conserved, which optimistically impacts self-esteem, identity, motivation, *locus of control*, and *outlook*.

The first model that therapist should include in the intervention stage is the compensatory model. The compensatory model assists patients to acquire and practice the use of adaptive methods such as compensatory strategies, adaptive equipment, assistive devices in addition to environmental and activity modifications when engaging and participating in their everyday occupations (Amini, 2011; Fisher, 2014). Ergonomic interventions comprising workplace modifications and preventative processes such as the implementation of correct postures are also applied to inhibit further disablement or disability (Calvo-Cerrada, Martínez & Dalmau, 2012). This process leads to individuals performing their everyday activities during all phases of tissue healing (Amini, 2011). The therapist should incorporate joint protection principles, energy conservation principles, work simplification and adult handling principles as the participants uses compensatory strategies, adaptive equipment, assistive devices as well as environmental and activity modifications when participating in their daily occupations. Compensatory strategies allow the participants to be able to participate in problem-solving and decision-making.

The second model that therapist should include in the intervention stage is the educational model. The educational model highlights the significance of participation in occupations and assists the therapist to make recommendations associated with how patients can advance their occupational performance (Fisher, 2014). During the education method, therapists should incorporate adult learning principles to generate a feeling of collaboration, shared power and partnership among the patient and therapist.

The third model that therapist should include in the intervention stage is the acquisitional model. Acquisitional occupation or occupational skills teaching involves

training the patient-specific skills such as joint protection and energy conservation principles to conquer functional deficiencies so that they can simplify these skills and apply it to all their activities performed in their everyday lives (Jack & Estes, 2010; Fisher, 2014; Hammond & Freeman, 2004). Therapists should utilize occupation as a means of treatment by urging patients to bring their own tools and equipment to the treatment session so that they can practice the occupation during therapy as well as at home (Che Daud et al., 2016).

Lastly, the fourth model that therapist should include in the intervention stage is the restorative model. The restorative model urges patients to actively perform and engage in their daily occupations in order to assist and encourage problem-solving strategies and conquer functional restrictions (Fisher, 2014).

(3) Occupation-based re-evaluation

The current study made use of a pre- and post-test, which enabled the researcher to do a pre- and post-assessment. This will be discussed further in chapter three of the study. This process allowed the researcher to compare pre- and post-assessment results to see whether the current OBHT intervention programme was successful. The rationale of re-evaluation is to assess whether patients have enhanced their quality and satisfaction in terms of their occupational performance and whether they have attained their occupational goals. The identical assessments should be utilised when re-evaluating occupational performance so that assessment outcomes are truthfully and precisely compared (Fisher, 2014). This regulates whether the intervention plan was effective or whether a new treatment plan should be applied to attain the patients desired goals (de Klerk et al., 2015; Fisher, 2014).

2.7 THEORETICAL FRAMEWORKS AND MODEL

This section presents the theoretical frameworks that guided the study is framed within the International Classification Framework (ICF), Biomechanical frame of reference and Occupational adaption model.

2.7.1 THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING

The International Classification of Functioning (ICF) promotes uniform language in health and health-related conditions (WHO, 2002). The ICF is a classification of health and health-related domains. The health condition that the current study is focusing on is hand injuries. The domains in the ICF assist in depicting and explaining alterations or deviations in body function and structure. Due to the participants with hand injuries, this leads to alterations and deviations in body function and structure as the health condition inhibits or alters body function. This depicts and explains what a person with a health condition can do in a standard environment, along with what they do in their usual environment. The domains are organised from the body, individual and societal perspectives. This uses two lists: a list of body functions and structure, and a list of domains of activity and participation. In the ICF framework, the word functioning relates to all body functions, activities and participation. However, the word impairments relates to activity limitation and participation restrictions. Due to the participants' hand injuries, impairment is present. This impairment would cause the participants to adapt in their usual environments to function in activities and participation. This is where the occupational adaption model comes into play, as the participants have to adapt to occupations in their usual environment due to their impairment.

ICF also lists environmental factors that interrelate with all these components. ICF has an optimistic view as it emphasises health and functioning other than focusing on disability. ICF contributes to scientific research by offering a framework or structure for interdisciplinary research in disability and for making findings of research comparable. Below is a figure illustrating the domains of the ICF framework and how all the components interrelate (WHO, 2002).

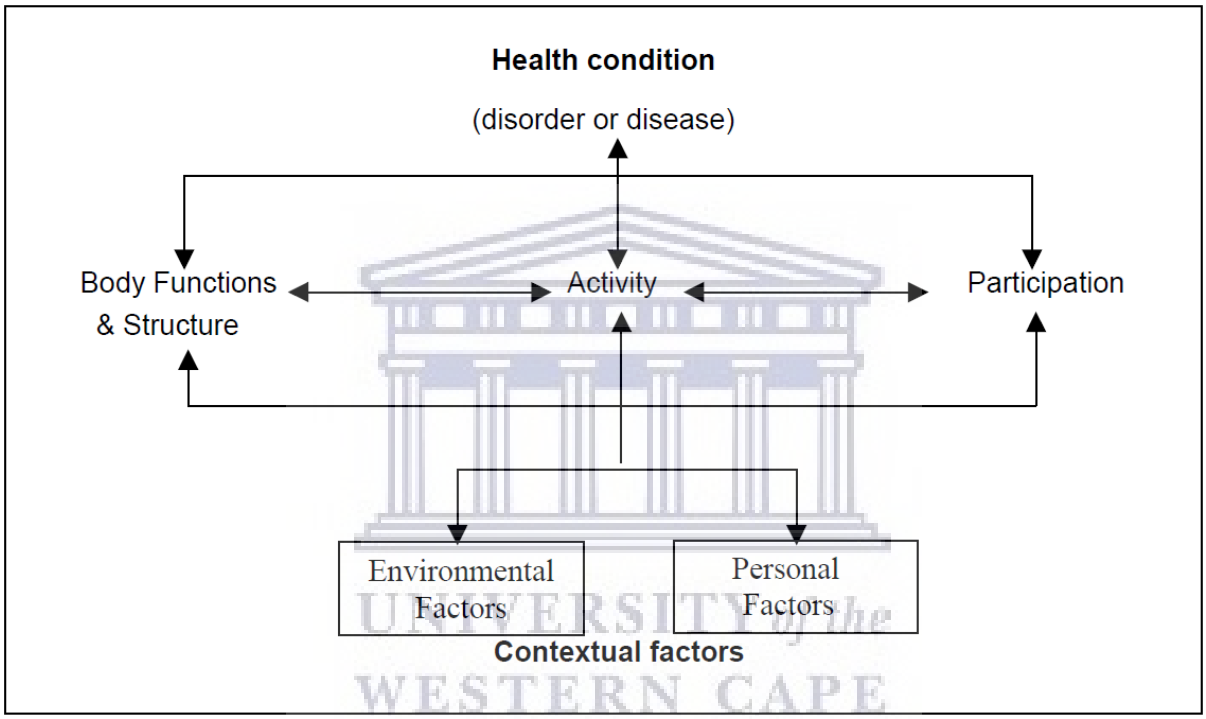


Figure 3: Domains of the ICF framework

As the figure above illustrates, in ICF, disability and functioning are regarded as the results of interrelations between the health circumstances (diseases, disorders and injuries) and relative influences, which are the contextual factors. The contextual factors contain environmental factors and personal factors. Examples of environmental factors are legal and social structures, terrain, climate, architectural characteristics and social attitudes. Examples of personal factors are age, social background, profession, overall behaviour pattern, gender, coping styles, education,

past and current experiences, character, and so forth which influences how disability is perceived and experienced by the individual. As highlighted by Jette, Haley and Kooyoomjian (2003), the ICF defined “body functions and structures” as physiological purposes of body systems or anatomical features such as organs, limbs and their components. “Activity” is considered as execution of specific tasks or actions that an individual engages in, while “participation” is envisioned as encompassing involvement in a life situation and societal roles.

The figure categorizes the three levels of human functioning, as classified in ICF: functioning is viewed at the level of body or body part, the whole person, and the whole person in a social context. On the other hand, disability contains dysfunction at one or more of these same levels: impairments, activity limitations and participation restrictions (WHO, 2002). ICF contributes to scientific research by offering a framework or structure for interdisciplinary research in disability and for making findings of research comparable. ICF is used to understand the clients’ health condition and its influence on participation as well as body functions and structures related to biomechanical aspects.

2.7.2 BIOMECHANICAL MODEL IN HAND THERAPY

Within the profession of occupational therapy, the services rendered were primarily offered under the biomechanical frame of reference. The biomechanical model includes range of motion (ROM), muscles strengthening exercises, and mobility activities (Jackson & Schkade, 2001). Additionally, the biomechanical frame of reference stress the importance of protecting the surgical interventions; wound healing, reducing present oedema, and providing scar management; and achieving

and preserving active range of motion (AROM) as well as passive range of motion (PROM) within patients (Jack & Estes, 2010).

Hypertrophic scarring was found to be reduced by the use of silicone gel sheeting which is one of the biomechanical approaches (O'Brien & Pandit, 2006). Scar massage was found to reduce pain and itching from scars related to burns and to lessen anxiety and depressed moods (Amini, 2011). The biomechanical model contains the concept of endurance (Pemberton & Cox, 2011).

Orthotic intervention that is commonly known as splinting in occupational therapy has been practised in the profession since at least the mid-20th century (McKee & Rivard, 2004). Splints or an orthosis are devices which are constructed for patients for many reasons including prevention or correction of deformities, relieve pain, protect against injury, promote healing, stabilize or immobilize and assist function. Splints can be applied to any body part, including the head, neck, back, shoulder, elbow, hand, hip, knee, ankle and foot. The core point of a splint when constructed and designed thoughtfully while being client-centred can assist the patient with protection and joint stabilization, relieving pain and allow the patient to engage and participate in meaningful occupations (McKee & Rivard, 2004).

Splints are constructed for patients to promote and improve their occupational performance and engagement in purposeful activities. However, it should be noted that occupational performance is often compromised by disease, acute injury, surgical intervention, cumulative trauma, degenerative changes or congenital anomaly (McKee & Rivard, 2004). Therefore, an orthosis is constructed and designed for patients to improve their occupational performance and to promote optimal healing of tendons,

ligaments, joint capsules and bones; and to prevent deformity or injury (McKee & Rivard, 2004).

When services are rendered in occupational therapy primarily under the influence of the biomechanical model, the musculoskeletal system is often referred to as a precision engine, which entails that all organs, systems, and cells work together, and in itself with flawless synchronization. In a different study, Lederman (2010) states that when all the systems work together in synchronization, the body (joints and body masses) is in some anatomically ideal relationship to each other. Muscles are in anatomical-physiological-functional equilibrium with motoneurons firing synchronously in perfect harmony. Diseases, injuries or damages are considered to be problems that result in disturbance of the harmonious relationship (Lederman, 2010).

Rehabilitation model is often used with patients in rehabilitation settings (Jackson & Schkade, 2001). The rehabilitation model initially starts with the assessment of patients physical body parts, such as the head, trunk and extremities. This assessment establishes the patients' strengths and weaknesses, which affects functional abilities for basic activities of daily living (Jackson & Schkade, 2001).

Occupational therapy remains a profession that promotes the importance of a client-centred approach in the process whereby the patients' goals are considered to guide intervention. However, main therapy goals are enabling the patients to build on their current strengths and to overcome deficits. This is possible with the altered or modified environment that may promote the use of assistive devices issued to facilitate engagement in ADL. In occupational therapy, both rehabilitation and the biomechanical models are often used in combination enhance patients' therapy

(Jackson & Schkade, 2001). These models enable occupational therapists to incorporate activities and exercises to decrease shortfalls in the patient's occupational performance (Jackson & Schkade, 2001).

In highlighting the theoretical models used in occupational therapy practice, Craig, Robertson and Milligan (2004) indicate that compensatory and biomechanical models are the most used in physical health care settings. Therefore, the structure, according to the ICF in this study, would be the upper limb and the health condition is the hand injuries. However, by incorporating the biomechanical model with the ICF, this would allow wound healing, reducing oedema, and providing scar management, which will improve the body function as AROM and PROM, will be achieved and preserved. The biomechanical model is used for prevention or correction of deformities, relieve pain, protect against injury, promote healing, stabilize or immobilize and assist function, which is aimed at improving occupational performance. Due to the health condition, which are hand injuries, the participants' occupational performance will be decreased. The occupational adaption model will be incorporated to improve the occupational performance by adapting the participants' occupations so that they are still able to participate in meaningful occupations, thus, increasing occupational performance.

2.7.3 OCCUPATION ADAPTION MODEL

In a study by Jackson and Schkade (2001), they stated that "the Occupational Adaptation model offers an explanation for an adaptation process that proposes occupation both as the means through which adaptation occurs and the end for which functional adaptation is desirable" (p. 532). Occupational adaption is a common process that results in ability or functioning in occupation. Disease, injury or trauma may disturb the process and may lead to abnormal adaptive responses to day to day

occupational encounters. In the Occupation Adaption Model, the occupational therapist assists the patient to restore the functional internal adaption process. When a patient engages with or participates in valued occupational activities, this will result in the patient most likely experiencing the re-establishment of a functional adaption process. An adaptive response leads to a patient retaining a superior relative mastery in their occupational activities. Relative mastery is calculated by three principles: efficiency, effectiveness, and satisfaction. Occupational Adaptation does not discount the biomechanical and rehabilitation philosophies for therapeutic intervention. However, the main emphasis of intervention is positioned on the patient's unique chosen occupational role, participation in monitoring and assessing the outcomes of the therapy process and affecting the adaptation outcome (Jackson & Schkade, 2001). The occupational adaptation model offers a foundation for patient care irrespective of the setting and speaks to the importance of a more client-centred and holistic approach by developing and nurturing a client-therapist relationship. The client-therapist relationship enables the facilitation of the patient's adaptation and ownership of intervention aims and development (Jack & Estes, 2010).

In another study, Schkade and Schultz (1992) state that "occupation provides the means by which human beings adapt to changing needs and conditions, and the desire to participate in occupation is the intrinsic motivational force leading to adaptation" (p. 532). This means that a client-centred approach to the engagement in occupations will allow the patient to be motivated to participate in occupations leading to adaption. In order to achieve the most significant effect on occupational adaptation, the tasks, techniques, activities, and methods of treatment should be focused on occupational activity that encourages satisfaction for the patient and the society

(Schultz & Schkade, 1992). Therefore, when a patient sustains a hand injury, the patient will have to adopt a new process to participate in desired occupations successfully. If the patient cannot participate in desired occupations, the patient will face activity restrictions and participation limitations as according to the ICF. The occupational adaption model makes use of a client-centred approach which is in line with the ICF theory. Due to the participants sustaining a hand injury, their health condition decreased their occupational performance which led to limitations in activity and participation. The occupational adaption model improves the participants' limitations to activity and participation by encouraging engagement in desired occupations through adaption. This leads to improving health, well-being, quality of life and human development. The biomechanical model is used in conjunction with the ICF, and the occupational adaption model as the biomechanical model affects the adaption outcome as its main aims is for prevention or correction of deformities, relieve pain, protect against injury, promote healing, stabilize or immobilize and assist function which is aimed at improving occupational performance.

2.8 OUTCOME MEASURES USED IN THE CURRENT STUDY

In relation to the outcome measures, this section deals with the Michigan Hand Outcomes Questionnaire and the Disability of the Arm, Shoulder and Hand.

2.8.1 MICHIGAN HAND OUTCOMES QUESTIONNAIRE DESCRIPTION

2.8.1.1 Description of the MHQ

The MHQ mainly consists of a 70-item disability/symptom Likert scale (a scale used to represent people's attitudes to a topic). The MHQ ask about the participants' views regarding their hands and their health. The questionnaire is aimed at finding out information on the bilateral hands and wrists. The first part of the questionnaire

referred to the function of the hand and wrist, the second part focused on the ability of the hands to do tasks, the third part referred to how the participants did their everyday work, the fourth part focused on pain in the hand and wrist, the fifth part focused on the appearance of the hand and wrist, and the sixth part referred to the participants' satisfaction of the hand and wrist. According to Horng, Lin, Feng, Huang, Wu and Wang (2010), the MHQ is a questionnaire comprised of a total of 37 questions precisely associated to the hand that is characterised below the following six domains: (1) overall hand functioning; (2) activity of daily living; (3) pain; (4) work performance; (5) aesthetics; and (6) patient satisfaction with hand functioning. McMillan and Binhammer (2009), agrees and state that the MHQ is a hand-specific questionnaire for patients or individuals with hand conditions. The authors furthermore states that the MHQ consists of 57 items, it differentiates between the left and right hands over six areas comprising overall hand function, activities of daily living, pain, work performance, aesthetics, and patient satisfaction with function (McMillan & Binhammer, 2009). The MHQ has been used in distal radius fracture, carpal tunnel syndrome, reconstruction, and arthroplasty in rheumatoid arthritis (McMillan & Binhammer, 2009).

2.8.1.2 Purpose of the MHQ

The MHQ was developed for the assessment of result for various hand disorders (Sambandam, Priyanka, Gul & Ilango, 2008). The Michigan Hand Outcome Questionnaire (MHQ) is a deep-rooted evaluation for patients with RA and extensively used in clinical trials (Dritsaki, Petrou, Williams & Lamb, 2017). The MHQ is suitable for use in RA diagnosis due to the all-inclusive data collected on functional capabilities as well as patient satisfaction, pain and hand appearance. The MHQ has been

employed to evaluate disability and it is frequently an outcome measure for clinical trials in RA (Dritsaki et al., 2017). The MHQ evaluates patient perception of hand function, appearance, pain, and satisfaction. However, the MHQ is not only used for RA, but it is also envisioned for people with hand or wrist conditions or injuries (Dritsaki et al., 2017). It can be utilised to measure a patient's overall hand function or can be used to evaluate fluctuations in hand function over time (Dritsaki et al., 2017).

2.8.1.3 2.7.1.3 Validity and reliability of the MHQ

Chung, Hamill, Walters and Hayward (1999) states that responsiveness is a significant property of an outcome questionnaire. It can be well-defined as the aptitude of an instrument to encapsulate necessary fluctuations in a patient's health status over time (Chung et al., 1999). Chung et al. (1998) did a study on reliability and validity testing of the Michigan Hand Outcomes Questionnaire and found that the MHQ is a reliable and valid instrument for measuring hand outcomes. The MHQ can be utilised in a clinic setting with nominal trouble to patients. The questions in the MHQ have endured rigorous psychometric testing, and the MHQ is a favourable instrument for the assessment of outcomes succeeding hand surgery. The reliability and validity of the MHQ have previously been established (Lamb, Williamson, Heine, Adams, Dosanjh, Dritsaki, Glover, Lord, McConkey, Nichols, Rahman, Underwood & Williams, 2015).

2.8.2 THE DISABILITY OF THE ARM, SHOULDER AND HAND

2.8.2.1 Description of the DASH

The DASH questionnaire enquires about the participants' symptoms as well as their ability to do certain activities. The DASH questionnaire is made up of 30 questions. The questions were aimed at finding information on the participants' ability to engage in ADL's, recreational activities, social activities, pain, work, sports and musical

instruments. According to Kitis, Celik, Aslan and Zencir (2009), the DASH consists of two components: the function, symptom, social role component and the optional high-performance sport/music or work component. The items ask about the extent of difficulty in engaging in various physical activities resulting from the arm, shoulder or hand problem (21 items), the extent of each of the symptoms of pain, activity-related pain, tingling, weakness and stiffness (five items), as well as the limitations impacting on social activities, work, sleep and self-image (four items). The DASH also comprised of two non-compulsory four-item scales regarding the ability to perform sports and/or to play a musical instrument, and the ability to work. Each item had five reply selections, stretching from ‘‘no difficulty or no symptom’’ to ‘‘unable to perform activity’’ or ‘‘very severe symptom’’, and is scored on a 1-to-5 point scale (Kitis et al., 2009). McMillan & Binhammer (2009), is also of the opinion that the DASH is a 30-item questionnaire utilized to assess disability for any disorder or injury affecting the upper limb by evaluating the severity of symptoms and effort in completing specific tasks. An IsiXhosa version of the DASH is currently available.

2.8.2.2 Purpose of the DASH

The DASH was intended to be utilized in several conditions of the upper limb (MacDermid & Tottenham, 2004). The DASH has been applied with a varied diversity of shoulder, hand, elbow and wrist difficulties. The DASH is considered a useful instrument for assessing patients in a general upper limb practice regardless of diagnosis. It does not comprise items on the aspect of the hand (Luc, 2008). The utilization of the DASH has been rising promptly in clinical trials and other studies of upper limb disorders, and it is now accessible in numerous languages (Gummesson, Ward & Atroshi, 2006). The justification following the use of one outcome measure for

various upper limb disorders is that the upper limb is a functional unit. Therefore, the DASH would be suitable because of its property of being mainly an evaluation of disability. The DASH can identify and distinguish small and large fluctuations in disability over time after surgery in patients with upper limb musculoskeletal disorders (Gummesson, Atroshi & Ekdahl, 2003).

2.8.2.3 Validity and reliability of the DASH

The DASH validity, reliability, and responsiveness have been reported for a variety of upper extremity conditions (De Smet, 2004; Gummesson, Atroshi & Ekdahl, 2003; Navsarikar, Gladman, Husted & Cook, 1999). Kitis et al. (2009) found that the DASH is a reliable and valid instrument to measure functional disability.

2.8.3 OUTCOME MEASURES FOR THE STUDY

The MHQ, as well as the DASH, relates to health, quality of life and well-being as part of occupational functions. Both outcome measures evaluate overall hand functioning, activities of daily living, pain, work performance and the social role components. This concur with the aim and objectives of the present study, as the study was aimed at examining the influences of OBHT in hand functioning with regards to areas of occupation among clients with hand injuries within occupational therapy practice. All the measurements assessed by the outcome measures have a direct impact on the occupational function, which leads to health, quality of life and well-being. Hand injuries limit occupational function; therefore, the MHQ and DASH are suitable to be used to evaluate the severity of limitations in occupational function due to hand injuries. El-Daly, Ibraheim, Rajakulendran, Culpan and Bates (2016) found that patient administered tools are commonly used by healthcare providers as a means of assessing health-related quality of life and function at any given time in intervention.

The complexity of patient administered tools can differ and when combined with varying degrees of adult literacy, error can be introduced if patients fail to understand questions. Furthermore, El-Daly et al. (2016) states that it is unclear to what degree patient administered tools can be read and understood by most patients (readability). Therefore, to our authors' understanding, the effects of the readability regarding patient administered tools have not been evaluated yet (El-Daly et al., 2016).

2.9 SUMMARY

It is known that within hand therapy rehabilitation in occupational therapy, the approaches for treatment are massage, sensory re-education, tendon gliding exercises, splints and therapeutic activities. There are different types of hand injuries comprising of lacerations, fractures and dislocations, soft tissue injuries and amputations, infections, burns and high pressure. Injuries and diseases of the upper limbs have a considerable influence on the population because of their high frequency of occurrence, which results in most circumstances to disability and economic cost.

In occupational therapy, occupations denote to the everyday activities that people do as individuals, in families and with communities to occupy time and bring a sense of meaning and purpose to life. Occupations contain things that people need to, want to and are expected to do. Occupational therapy emphasises on allowing individuals and groups to participate and engage in daily occupations that are important to them, provide fulfilment, and involve them in everyday life with others. Occupational therapy is based on the use of occupations in therapy to improve patients' health and well-being. However, this core basis of occupational therapy has been absent in the treatment of patients in various settings. Elimination of occupations results in

decreased health, physiological changes and increased stress. Therefore, it is evident that everyday occupations are a vital part of everyday life ranging from functional to physiological outcomes. The OBI process is made up of three aspects (1) assessment, (2) intervention, and (3) measurement of outcome.

In this study, two outcome measures were used, which consist of Michigan Hand Outcomes Questionnaire and The Disability of the Arm, Shoulder and Hand. This study is framed within the International Classification Framework (ICF), Biomechanical frame of reference and Occupational adaption model.

CHAPTER THREE

METHODOLOGY

3 INTRODUCTION

Chapter three describes the research paradigm, research approach and the research design, which have been used within the study. In addition, this chapter has presented the study setting, participant selection and recruitment as well as the data collection tools and methods used to collect the data for the study. Furthermore, the study also gives an overview of the data gathering procedure, which the researcher used to gather the data. The process of data analysis, validity and reliability has been further discussed in this chapter. The ethical implications related to the study have been taken into consideration.

3.1 RESEARCH PARADIGM

In this study, a pragmatism paradigm has been used. A paradigm guides research efforts, its purpose is to reaffirm itself to the elimination of other paradigms and to express the theories it already established (Feilzer, 2010). According to Morgan (2014), a pragmatism paradigm disturbs the traditions of older approaches founded on the philosophy of knowledge, while providing favourable new directions for understanding the nature of social research. Mixed methods as a research community have a solid trend to emphasize the how-to aspects of research; however, this encapsulates only a portion of the significance of pragmatism, which essentially places more importance on questions about why to research a given way. According to Denzin (2012), classic pragmatism is not a methodology in isolation. It is a principle of

meaning, a theory of truth. Feilzer (2010) states that pragmatism when viewed as a different paradigm, bypasses the touchy issues of truth and reality and therefore accepts that philosophically there are singular and multiple realities that are exposed to empirical analysis and positions itself toward explaining practical problems in the ‘‘real world’’. In that case, pragmatism allows the researcher to be unrestricted of mental and practical constrictions obliged by the ‘‘forced-choice dichotomy between post-positivism and constructivism’’ (Creswell & Plano Clark, 2007, p. 27), and researchers do not have to ‘‘be the prisoner of a particular research method or technique’’ (Robson, 1993, p. 291).

Morgan (2007) states that the pragmatic approach is to depend on a type of abductive reasoning that travels back and forth between induction and deduction- initially translating observations into theories and then evaluating those theories through action. From a pragmatic viewpoint, the solitary way to assess those interpretations is through action. Therefore, one of the most significant shared uses of abduction in practical reasoning is to advance a method of analysis that evaluates the findings of earlier inductions through their ability to forecast the workability of yet to come lines of behaviour. Morgan (2007) furthermore states that this specific form of the abductive process is somewhat acquainted with researchers who combine qualitative and quantitative methods in a consecutive manner where the inductive results from a qualitative approach can assist with inputs to the deductive goals of a quantitative approach, and vice versa.

Any involved and practising researcher has to work back and forth amid several frames of reference, and the classic pragmatic highlights the importance of an intersubjective approach that captures a duality, which is subjectivity or objectivity

(Morgan, 2007). Intersubjectivity also embodies the sensible response to matters of being incomparable. Morgan (2007) further explains that in a pragmatic approach, there is no difficulty with proclaiming both that there is a single “real world” and that all individuals have their unique understandings of that world. Preferably than considering incommensurability as an uncompromising barrier among shared experiences, pragmatists treat issues of intersubjectivity as a critical element of social life (Morgan, 2007).

Morgan (2007) highlights that researcher cannot merely adopt that our methods and our research approach make our outcomes either context-bound or generalizable, however, researchers need to explore the aspects that affect whether the knowledge we achieve can be transmitted to other settings. Morgan (2007) states that the typical pattern is evaluating whether the results from one specific program evaluation have effects for the use of similar programs in other contexts. This encouragement of transferability thus ascends from a dependably pragmatic emphasis on what people can do with the information they produce and not on nonconcrete arguments about the probability or impracticality of generalizability (Morgan, 2007). Therefore, researchers always need to ask how much of our current knowledge could be operational in a new area of settings and environments, as well as what our justification is for making any such claims. Morgan (2007) concludes by stating that an emphasis on abduction, intersubjectivity, and transferability generates a variety of innovative prospects for thinking about typical methodological matters in the social sciences.

3.2 RESEARCH APPROACH

An embedded mixed-method has been used to obtain a better understanding of the research phenomenon. While designing a mixed-methods study, three issues need consideration: priority, implementation, and integration (Creswell, Plano Clark, Guttman & Hanson, 2003).

Priority: Priority refers to which method, either quantitative or qualitative, is given more emphasis in the study (Creswell et al., 2003). In this current study, quantitative data has been given priority as the research question is aimed at finding out whether OBHT improves hand functioning in areas of occupation among clients with hand injuries. This has been done by using the pre and post-test methods which gathered the outcomes using quantitative methods. The qualitative data has been embedded to provide supportive information on the effects of OBHT on hand injuries.

Implementation: Implementation discusses whether the quantitative and qualitative data collection and analysis come in categorisation or chronological stages, one following another, or in parallel or concomitantly (Creswell et al., 2003). The data has been collected and analysed using the convergent strategy where quantitative and qualitative data are collected and analysed concurrently and independently. In the study, the researcher has conducted the questionnaires, range of motion tests and questions relating to the participants' engagement in occupations concurrently and independently.

Integration: Integration discusses the phase in the research process where the mixing or connecting of quantitative and qualitative data take place (Creswell et al., 2003). In this study, the outcomes of the quantitative and qualitative have been integrated during the discussion of the outcomes of the entire study. The researcher in this study has

conducted an embedded mixed-method research as it allowed the researcher to attain more complex information through the research. Almalki (2016) states that the embedded design perceives one method of enquiry being applied in a supportive secondary role, which empowers researchers and readers to make sense of the study in its totality. This method is used in quantitative experimental designs where only a limited quantity of qualitative data is necessary (Almalki, 2016). Quantitative Research establishes statistically significant conclusions about a population by studying a representative sample of the population (Creswell, 2003). The results of the study were aimed, using deductive logic, to answer the research question, which was: Does Occupation-based hand therapy improve hand functioning in areas of occupation among clients with hand injuries?? Deductive research begins with a theory and a hypothesis, which guides data collection and analysis. The qualitative data have been collected at two-time point's pre and post-intervention. This has assisted the researcher in understanding and exploring the participants' subjective feelings of their prior level of functioning before the intervention and after the intervention to compare the qualitative results to conclude whether OBHT has improved their hand injuries.

3.3 RESEARCH DESIGN

The current study has employed a one-group pre-test- post-test quasi-experimental research design with the qualitative data collected playing a supplemental role within the mixed methods design. Quasi-experimental approaches that include the formation of a comparison group are most often used when it is not possible to randomize individuals or groups to treatment and control groups (White & Sabarwal, 2014). The absence of a control group led the researcher to use only one group of clients with hand injuries to observe the changes based on pre-test- post-test. Nonetheless, this

study was a pilot study where all the participants received the same intervention as part of an experimental protocol, which guided to preliminary data collection in two phases.

3.4 CONTEXT OF THE STUDY

Nelson Mandela Academic Hospital is situated in Mthatha, Eastern Cape, which was formerly known as the Transkei. Mthatha is neighbouring a little town called Qunu, which was home to the former South African president Nelson Mandela. According to Hamann and Tuinder, (2012), in 1990, the 71-year-old Nelson Mandela was released from prison, which was announced by President F. W. de Klerk. The release of Nelson Mandela was followed by years of negotiations to end Apartheid. The talks concluded in South Africa's first democratic elections in 1994. The ANC party won the elections in 1994, which resulted in Nelson Mandela, becoming the new president of the country. The Eastern Cape Province is the second largest province in South Africa after the Northern Cape. The Eastern Cape Province covers an area of close to 169 000 sqkm. The province's inhabitants make up 13.5% of South Africa's total population. The population is 87.6% African, 7.5% Coloured, 4.7% White and less than 0.3% Indian. The home language of the majority of the Eastern Capes population is isiXhosa. Fifteen percent of the over 20-year-olds in the province cannot read or write. Regardless of progress in the providing of housing and essential services by the government since 1994, the Eastern Cape still has some of the highest rates of poverty and unemployment in the country. It has been reported that 72% of the Eastern Capes population was living below the poverty line, which was recorded in 2004 (Hamann & Tuinder, 2012).

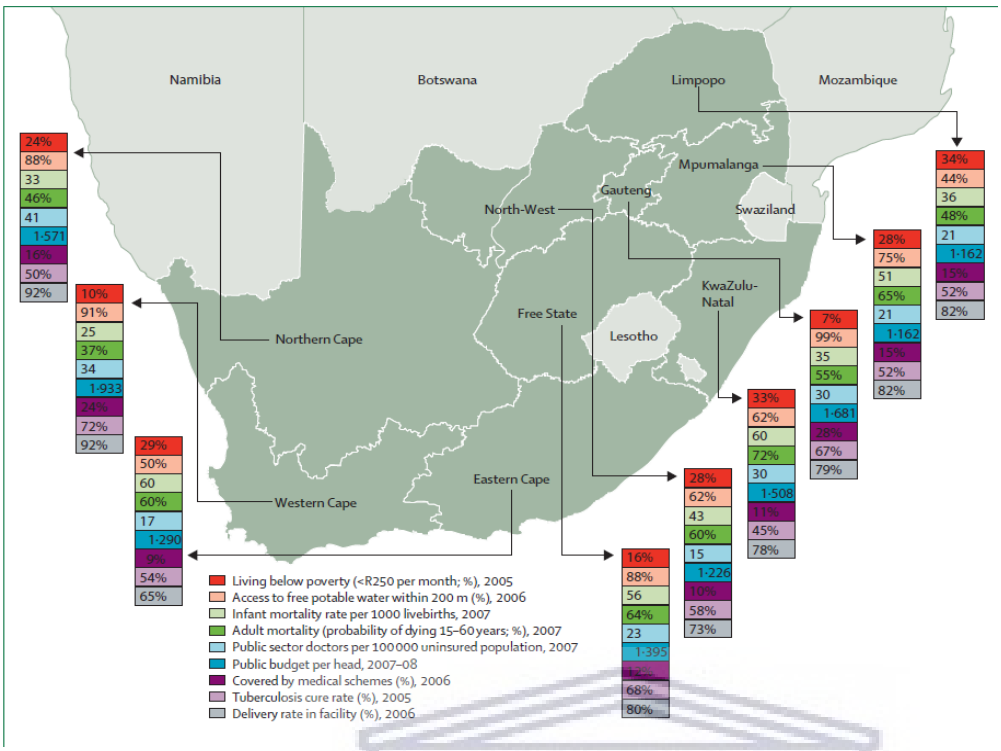


Figure 4: The Eastern Cape is the third most province with people living below the poverty line

Above Coovadia, Jewkes, Barron, Sanders and McIntyre (2009) display in the figure that the Eastern Cape is the province with third most people living below the poverty line.

According to Hamann and Tuinder (2012), the rate of unemployment in the province by the middle of 2010 was 27.7%. The unemployment rate between Whites was 4% compared to 30% and 31% for Africans and Coloureds correspondingly. The social security system provides a diversity of grants to qualifying individuals. During 2007, 30.5% of all households in the Eastern Cape received social grants. In the former Transkei, only 37% of people get piped water to their dwelling, and 31% of the population relies on natural sources of water. The provincial typical for households without sanitation is at 30% high, and on average, only 49% of the province is

electrified (Hamann & Tuinder, 2012). According to STATS SA (2016), 1367 people are unemployed amongst a total working population of 4129 in the Eastern Cape Province, which is shown in the table below.

Table *1*: Unemployment amongst the working population in the Eastern Cape

Table 2.3: Labour force characteristics by province and metro (continued)

	Jan-Mar 2015	Apr-Jun 2015	Jul-Sep 2015	Oct-Dec 2015	Jan-Mar 2016	Qtr-to-qtr change	Year-on-year change	Qtr-to-qtr change	Year-on-year change
	Thousand	Thousand	Thousand	Thousand	Thousand	Thousand	Thousand	Per cent	Per cent
Eastern Cape									
Population 15–64 yrs	**4 098**	**4 106**	**4 115**	**4 124**	**4 129**	**5**	**31**	**0,1**	**0,8**
Labour force	**1 929**	**1 927**	**1 937**	**1 945**	**1 914**	**-31**	**-15**	**-1,6**	**-0,8**
Employed	1 358	1 366	1 372	1 411	1 367	-44	9	-3,2	0,7
Unemployed	572	561	565	534	547	13	-25	2,5	-4,3
Not economically active	2 168	2 179	2 177	2 179	2 215	36	47	1,7	2,2
Discouraged work-seekers	425	419	426	376	510	134	85	35,7	20,0
Other	1 743	1 761	1 751	1 803	1 705	-98	-38	-5,4	-2,2
Rates (%)									
Unemployment rate	29,6	29,1	29,2	27,4	28,6	1,2	-1,0		
Employed/population ratio (absorption)	33,1	33,3	33,3	34,2	33,1	-1,1	0,0		
Labour force participation rate	47,1	46,9	47,1	47,2	46,4	-0,8	-0,7		
Eastern Cape – Non-metro									
Population 15–64 yrs	**2 816**	**2 823**	**2 829**	**2 836**	**2 841**	**5**	**25**	**0,2**	**0,9**
Labour force	**1 063**	**1 077**	**1 078**	**1 127**	**1 090**	**-37**	**26**	**-3,3**	**2,5**
Employed	759	784	781	822	789	-33	30	-4,0	3,9
Unemployed	305	293	298	305	301	-4	-4	-1,3	-1,2
Not economically active	1 753	1 746	1 751	1 709	1 751	42	-2	2,5	-0,1
Discouraged work-seekers	423	407	423	363	479	116	55	31,9	13,1
Other	1 330	1 338	1 328	1 346	1 273	-74	-57	-5,5	-4,3
Rates (%)									
Unemployment rate	28,6	27,2	27,6	27,1	27,6	0,5	-1,0		
Employed/population ratio (absorption)	26,9	27,8	27,6	29,0	27,8	-1,2	0,9		
Labour force participation rate	37,8	38,2	38,1	39,7	38,4	-1,3	0,6		

Due to rounding, numbers do not necessarily add up to totals

(STATS SA, 2016)

South Africa has high rates of incidences of crime occurring due to poverty, which results in disability. According to Møller (2005), South Africa has high crime rates by international standards, and one of the biggest challenges in the second decade of democracy in South Africa is fighting crime. However, findings suggest that the negative influence of crime issues on achieving a good life are overshadowed by issues of racial inequalities and poverty (Møller, 2005). According to Coovadia et al. (2009), violence and injuries amount to a further cause of premature deaths and disability. Racial and gender discrimination, the demolition of family life, the migratory labour system, vast income inequalities, and life-threatening violence have all formed part of South Africa's concerning past, and all have inevitably affected health and health services. The black population has been disadvantaged in the face of general

white affluence, which is one of the most critical influences on the health of South Africa. In the past overcrowding, low wages, malnutrition, stress and inadequate sanitation has resulted in the health of the black population to depreciate. Income differences have also had a key effect on the problems of crime and violence.

It has been suggested that unemployment has been worsened by low educational completion, and a dysfunctional education system is a persistent legacy of apartheid (Coovadia et al., 2009). Wegner, Flisher, Chikobvu, Lombard and King (2008) reported that in South Africa, a significant worry in adolescent health and education is school dropout, which is defined as leaving school before finishing a given grade in a given school year. Adolescents who dropped out of school had advanced rates of cigarette and alcohol usage compared with those still in school. Often enough, these leisure activities such as smoking and the use of alcohol results in conflict amongst these adolescents, which then leads to violence and sometimes physical and mental disabilities. Positive leisure opportunities provide adolescents with positive youth development. Engaging in leisure activities provide adolescents with a background for developing identity, motivation, autonomy, and self-regulated behaviour. Additionally, leisure gives opportunities for personal improvement and socialisation, and allows adolescents to grow important skills such as decision-making and planning (Wegner et al., 2008). However, if an adolescent does not engage in these positive leisure experiences, they will continue engaging in negative leisure, which will result in them not enriching themselves and finding a job to better their lives. Wegner et al. (2008) found that adolescents living in a socially impoverished area of South Africa had restricted opportunities to engage in leisure activities due to the absence of leisure means within the environment, and many adolescents spent their time sitting around

in groups outside and on the streets because they had nothing else to do. These activities of leisure boredom also result in crime and violence as the adolescence are bored, unemployed and need money to survive and participate in these leisure experiences such as alcohol use and smoking. Below is a figure is taken from the paper of Coovadia et al., (2009) which indicates that the OR Tambo district, which Mthatha is situated in, is one of the most deprived sections in the Eastern Cape regarding socioeconomic status.

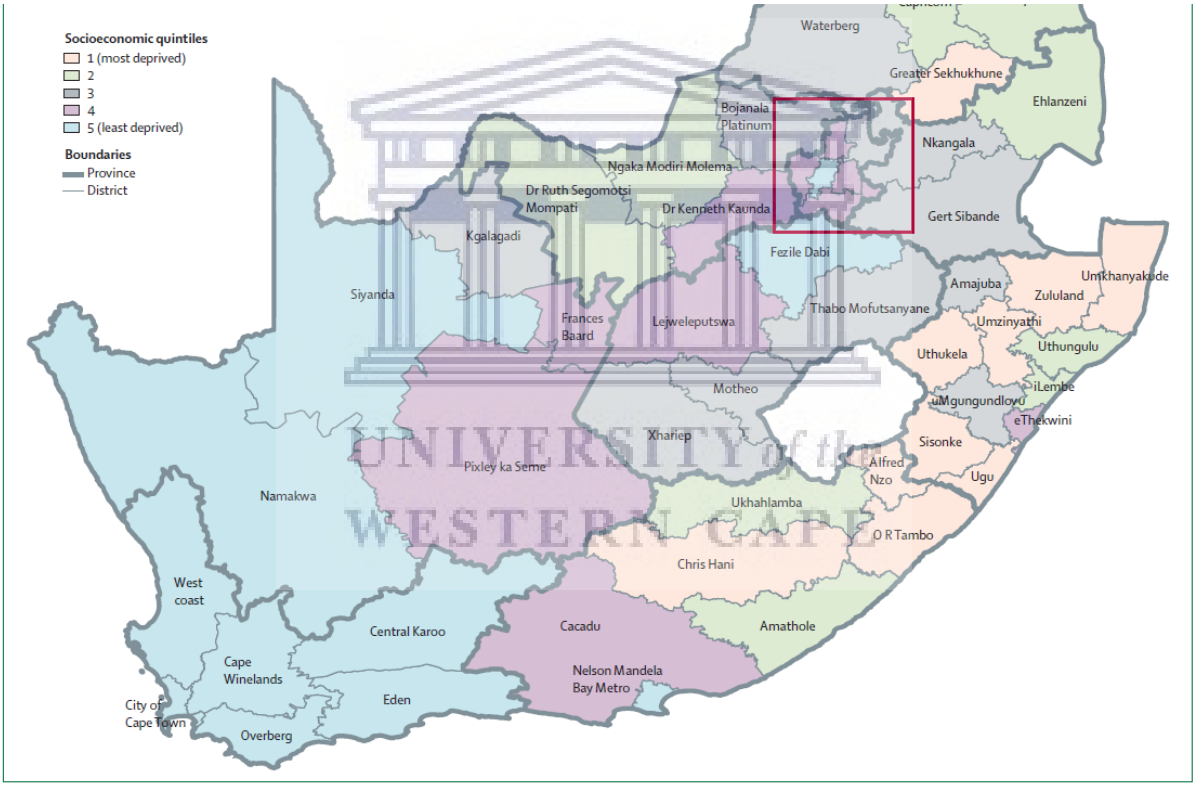


Figure 5: OR Tambo district level on socio-economic status

Jewkes, Levin and Penn-Kekana (2002) revealed that domestic, as well as intimate partner violence, is widely being noticed as a public health problem and linked with injuries and various other physical and mental health problems in South Africa. It was found that violence is often used to exercise power in conflict situations (Jewkes et al.,

2002). Violence is a part of South African society. For many people violence is the initial approach for resolving conflict, which was practised during the apartheid era, which stemmed from state-sponsored violence. Forms of violence have been described as a range between threatening to beat, pushing, slapping, assaulting with fists, hitting with a stick and other objects, stabbing with a knife, violent rape, shooting, or 'persuading' a woman to have sex (Jewkes et al., 2002). Many of the physical disabilities that stem from violence and crime incidences at Nelson Mandela Academic Hospital results in various types of hand injuries.

In 1994, the ANC published a health plan, which was a post-apartheid model for the health system change. The public health system was converted into a combined, inclusive national service, motivated by the need to amend historical injustices and to provide essential health care to disadvantaged (particularly rural) people (Coovadia et al., 2009). According to Bateman (2010), the Eastern Cape has the country's lowest public health spending and one public sector doctor to every 5 882 people, and the highest poverty levels which make up the country's second-lowest ratio. Because many of the population in the Mthatha are unemployed and live in the outlying rural areas surrounding Mthatha, it makes it difficult for the people to seek medical attention as they do not have money to travel to the hospital in Mthatha. Bateman (2010) states that one of the main problems for the patients in the mostly rural province is the travel distances to Nelson Mandela Academic Hospital. de Klerk et al. (2016) attempted to explain that as occupational therapists we practice in a varied and diverse nature of the social, physical and attitudinal environments and the patient population served, limit the potential for the delivery of routine occupational therapy services. It was found that in some locations, the ineffective application of health policies, envisioned for

improved service delivery continues. The shortage of suitable clinicians in health care settings also obstructs sufficient service delivery (de Klerk et al., 2016). However, limitations in the South African context such as time, shortage of staff, patients defaulting treatment due to travel distances and lack of money, and resources limits the application of the OBHT approach.

3.5 STUDY SETTING

The study has been conducted at Nelson Mandela Academic Hospital in Mthatha. It is a 512-bed tertiary hospital, which is used as a teaching hospital and provides a variety of services to the population, which include occupational therapy. The home language of the majority of the Eastern Cape population is isiXhosa; however, many of the people residing in this province cannot read or write (Hamann & Tuinder, 2012). Jewkes et al. (2002) state that domestic violence is widely being noticed, as a public health problem that linked with injuries and various other physical and mental health problems in South Africa. Issues that influence the patients attending follow-up visits at the hospital is due to it being a largely rural province (Bateman, 2010).

3.6 PARTICIPANT SELECTION AND RECRUITMENT

A convenient sampling method has been used to select participants from the clients who presented with hand injuries and seeking hand rehabilitation in the occupational therapy department at the Nelson Mandela Academic Hospital. According to Etikan, Musa and Alkassim (2016), the sampling method technique used in a study depends on the type, nature and purpose of the study. When participants for a study are recruited because of the close contiguity to a researcher, specifically, the ones that are easier for the researcher to access, the researcher is making a convenience sampling (Etikan et al., 2016). Hence, in the current study, the researcher opted to use

convenient sampling, as the participants in the study were patients of the hospital, which were referred to the occupational therapy department for hand rehabilitation. Thus, making the participants recruited easier for the researcher to access as they were referred to the occupational therapy department for hand rehabilitation.

Convenience sampling is one of nonprobability methods used to select participants who meet the criteria of the proposed study such as easy accessibility, geographical proximity, availability at a given time, and the willingness to participate are included for the study (Etikan et al., 2016). Therefore, the inclusion criteria for the current study were clients who have sustained a hand injury and were referred to occupational therapy for rehabilitation, which were males and females, and all races.

The clients with old hand injuries and those who sustained head injuries, which resulted in a loss of function of the upper limbs, were not recruited to participate in the study. The reason for excluding clients with old hand injuries was that the results of the study could not be accurately measured with OBHT as time of rehabilitation after a hand injury plays an important role with regards to the outcome of the clients' hand functioning post hand injury. Clients who sustained head injuries were excluded from the study as this was not the focus of the study and this could also bring up different issues regarding quality of life. The focus of the study were on the hand conditions mentioned in the literature review. The treatment session was set at one of the treatment rooms in the occupational therapy department to decrease stress, ensure confidentiality and to provide the participant with privacy. By setting the treatment sessions in a neutral, clinical environment, the replicability of the study has been reached, which would assist if the study were to be repeated (Myers & Shaw, 2004).

The researcher in the current study is also the occupational therapist who works at the hospital aforementioned who performed the study with the participants.

Permission has been obtained from the CEO of NMAH to recruit the patients from the hospital. This led the researcher to engage in a face-to-face approach to recruit clients who were referred for occupational therapy services after they sustained hand injuries. A sample size of 25 patients was recruited after they received information about the purpose of the study. 25 patients were recruited for the study as resources were limited and the researcher was the only occupational therapist carrying out the study with the participants. The main resource that was limited was time as seeing 25 patients on a weekly basis was a lot for one occupational therapist among other work. Hence, the reason why 25 participants were selected for the study. New patients with hand injuries are referred to the occupational therapy department on a daily basis. However, the researcher has stopped recruiting participants for the study once the sample size of 25 participants have been reached. The participants who were recruited had participated in treatment sessions that were set at one of the treatment rooms in the occupational therapy department to decrease stress, ensure that their confidentiality and privacy were respected as part of human dignity. By setting the treatment sessions in a neutral, clinical environment, the replicability of the study has been reached, which would assist if the study were to be repeated (Myers & Shaw, 2004).

3.7 DATA GATHERING PROCEDURE

The research entailed a pre-questionnaire, post-questionnaire as well as pre and post-assessment of joint range of motion using a finger and hand goniometer. Furthermore, two outcome measures, known as the Michigan Hands Outcome Questionnaire (MHQ) and Disabilities of the Arm, Shoulder and Hand (DASH), were used as part of

the assessments, which was done before and after the intervention. The licenses for using the outcome measures are presented (Appendix 2). Joint range of motion (JROM) assessment, which was also done before and after the intervention (Appendix 3), questions relating to the participants' engagement in occupations (Appendix 4), observations and medical notes.

Outline of the treatment sessions:

Week 1: The pre-assessments (MHQ, DASH and JROM), interviews and consent forms of all participants were done on the initial session.

Week 2- 11: All the participants have received 10 weeks of supervised hand therapy and a home program. Each of the 10 sessions was one hour long where the participants had received 20 minutes of therapeutic exercises and 30 minutes OBHT. Each session started with warm water baths (10 minutes) to prepare the participants for therapeutic exercises and active mobilisation. Kovács, Pecze, Tihanyi, Kovács, Balogh and Bender (2012) found that warm tap water baths assist in the improvement of hand functioning. After each session, the participants were educated regarding their home program. The home program was for the participant to practice precisely what was learnt in the therapy session every day at home until they come for the next week's session. The home program has been monitored employing a checklist, which has been issued to each participant after his or her therapy session. The participants were required to tick each day when they have completed the OBHT at home (Appendix 5). The checklist has also been translated to IsiXhosa. The sessions have been structured as follows: a warm water bath (10 minutes) followed by therapeutic exercises. The therapeutic exercises will be passive mobilisation (5 minutes), passive assisted

mobilisation (5 minutes), active mobilisation (5 minutes) and strengthening exercises (5 minutes) using a *theraband*/*theraputty*. Thereafter the participants participated in the OBHT. The OBHT consisted of sorting money (10 minutes), tying shoelaces and buttons (10 minutes), and washing dishes as well as drying the dishes (10 minutes). The OBHT selected for the participants were relevant as these were the occupations that the participants engaged in daily.

Week 12: The post-assessments (MHQ, DASH and JROM) and interviews were done on the last session, which was in week 12.

The MHQ and DASH were stored in the participants' occupational therapy file where it was safe and easily accessible to the researcher. This has always ensured confidentiality. The questions relating to the participants' engagement in occupations was conducted on the first session as well as the last session (12th session) which has assisted the researcher in discovering the qualitative results of the study. The questions relating to the participants' engagement in occupations has been recorded on a voice recorder. The use of a translator has been used for the participants that can only speak isiXhosa as the researcher could not understand isiXhosa. The translator was one of the occupational therapists who was able to speak isiXhosa. The DASH and the MHQ have not been translated to isiXhosa as many of the participants were not able to read and write. However, an IsiXhosa version of the DASH is currently available. Therefore, the use of a translator was more beneficial as the translator can read and write the participants' responses on the questionnaires. The translator and researcher verified the responses of the participants by asking the question and then asking the question again with repeating their answer back to the participant for verification. The same process has been followed for the participants that could

understand English, but the researcher was reading and writing the participants' responses. The observations have been used to develop the objective results of the study as the researcher has been continuously observing the participants throughout the study. The observations have been written down in the participants' occupational therapy file, which was stored in the occupational therapy department, which allowed the researcher to keep track of all the participants adequately. The participants have been seen in the occupational therapy department and have been seen for 12 sessions, where they received occupational therapy treatment. Patients have been seen once a week; therefore, the findings of the study have been found over a period of twelve weeks per participant. However, the participants did not all initiate their occupational therapy intervention at the same time, which cause the data collection to run for 8 months. Participants were seen in the occupational therapy department on Monday, Tuesday, Wednesday and Thursday. The equipment that has been used in the study was equipment that was found within the occupational therapy department. The results of the study may also be a basis for other researchers to further the study and for Occupational Therapists to use within their hands-therapy treatment.

3.8 DATA COLLECTION

In this study, data were collected with an assisted-administered questionnaire, which was adapted from other studies of hand injuries and outcomes measures (Horng et al., 2010; Shauver & Chung, 2013; Poole, 2011). The questionnaire comprised three sections, namely, part one: demographic characteristics, part two: measurement tools (DASH scale and Michigan scale), and part three: patients' feelings on engagement in occupations.

3.8.1 Part one: Demographic characteristics

The demographic information has been obtained regarding the participants' age, gender, hand dominancy, race, marital status, education level, occupation, household income status and type of hand injury. Race has been divided into African, White, Coloured and Indian. Marital status has been divided into single, married, divorced and separated. Level of education has been categorised into primary school, high school and tertiary level. Household income has been included in this study, as this affected the rate of recovery and can be used to compare hand injury recovery rates in future studies. The demographic information has been changed to suit a South African context.

3.8.2 Measurement tools

3.8.2.1) DASH

The Disabilities of the Arm, Shoulder, and Hand (DASH) measurement instrument was used to assess participants with hand injuries as well as their ability to engage in certain activities. The DASH questionnaire is made up of 30 questions. The questions were aimed at finding information on the participants' ability to engage in ADL's, recreational activities, social activities, pain, work, sports and musical instruments. According to Kitis et al. (2009), the DASH consists of two components: the function, symptom, social role component and the optional high-performance sport/music or work component. The items ask about the extent of difficulty in engaging in different physical activities resulting from the arm, shoulder or hand problem (21 items), the extent of each of the symptoms of pain, activity-related pain, tingling, weakness and stiffness (five items), as well as the limitations impacting on social activities, work, sleep and self-image (four items). The DASH also comprised two non-compulsory

four-item scales regarding the ability to perform sports and/or to play a musical instrument, and the ability to work. Each item had five response selections, stretching from ‘‘no difficulty or no symptom’’ to ‘‘unable to perform activity’’ or ‘‘very severe symptom’’, and is scored on a 1-to-5 point scale (Kitis et al., 2009). The DASH has been reported by various researchers to have high content validity, and internal consistency and the test-retest reliability was found to be excellent for the overall DASH (Tongprasert, Rapipong, & Buntragulpoontawee, 2014; Kitis et al., 2009; Atroshi, Gummesson, Andersson, Dahlgren, & Johansson, 2000).

3.8.2.2) Michigan hand outcomes questionnaire (MHQ)

The MHQ mainly consisted of a 70-item disability/symptom Likert scale (a scale used to represent people's attitudes to a topic). The MHQ involved the participants’ views about their hands and their health. The questionnaire aimed at assessing participants’ bilateral hands and wrists function. According to Horng et al. (2010), the MHQ is a questionnaire comprised of a total of 37 questions precisely associated to the hand that is characterised below the following six domains: (1) overall hand functioning; (2) activity of daily living; (3) pain; (4) work performance; (5) aesthetics; and (6) patient satisfaction with hand functioning. The first part of the questionnaire referred to the function of the hand and wrist. In addition, the second part of the MHQ focused on the ability of the hands to do tasks. In the third part of the MHQ, it focuses on how the participants performed their routine work. Furthermore, the fourth part of the MHQ focused on the pain in the hand and wrist. In the fifth part of the MHQ, the focus is on the appearance of the hand and wrist. The last part involved the participants’ satisfaction with their hand and wrist. Many studies have been done where it was found that the MHQ is an internally consistent, valid, and reliable hand function questionnaire

(Arwert, Keizer, Kromme, Vlieland, & Meesters, 2016; Dritsaki et al., 2017; Meireles, Natour, Batista, Lopes, & Skare, 2014).

The tools were originally designed to be self-administered, however, due to the low literacy levels in the setting the tools were administered using a translator. However, previously El-Daly et al. (2016) mentioned that it is unclear to what degree patient administered tools can be read and understood by most patients. Therefore, having a translator translate the questions of the tools in a language that the patients are comfortable and familiar with made it easier for the participants. The MHQ was chosen in this study as it is found to show good measurement properties for a variety of hand conditions (Wehrli, Hensler, Schindele, Herren, & Marks, 2016). The DASH was also chosen in this study as it is found to have good psychometric properties when used with participants with musculoskeletal conditions (Dalton, Lannin, Laver, Ross, Ashford, McCluskey, & Cusick, 2017). The data that has been found through the MHQ, DASH, JROM and observations have been analysed using a statistical computer program. The JROM was measured using a goniometer which measures how much movement a participant has through each joint. In this study, the independent variable was the intervention, and the dependent variable was the measure of improvement of the hand injury.

1) The third section was comprised of the participants being asked to make comments about their engagement in occupations. The questions were formed by the researcher and supervisor having a meeting and discussing what qualitative data would be relevant to address in the study. The questions were formed by the researcher and supervisor looking at the aim, research question

and objectives of the study and paraphrasing it to form questions for the participants to answer.

3.9 DATA ANALYSIS

3.9.1 QUANTITATIVE DATA ANALYSIS

Statistical Package for the Social Sciences (SPSS) software 26 has been used for quantitative data analysis (SPSS, Inc., Chicago, IL, USA). The researcher cleaned and coded the data in preparation for data analysis. The researcher computed the descriptive statistics frequencies, mean, standard deviations. Subsequently, the inferential statistics were calculated to establish whether there were changes in DASH and MHQ using the nonparametric Spearman correlations. The correlation coefficients have been interpreted based on the small (0.10-0.29), moderate (0.30-0.49) or large (0.50-1.0) (Schouffoer, van der Giesen, Beaart-van de Voorde, Wolterbeek, Huizinga & Vliet Vlieland, 2016). The questions relating to the participants' engagement in occupations, observations and medical notes have formed a part of the qualitative data analysis.

3.9.2 VALIDITY AND RELIABILITY

The study has been reliable, as the researcher has assessed the participants MHQ scores and DASH. Reliability is the capability of separate researchers to come to comparable conclusions using the identical experimental strategy or participants in a study to dependably produce the same measurement (De Vaus & De Vaus, 2001). The DASH and the MHQ mutually evaluate physical health and pain symptoms. Social and emotional health is measured more widely by the DASH. On the other hand, the MHQ assess the left and right hand and has six separate subscales. The DASH is

designed for upper limb disorders, and the MHQ is designed to focus on the hand and wrist. The study has been valid as the results found in the study can be applied to generalised patients with hand injuries as this study aimed to describe the outcomes of the use of OBHT in improving and managing hand injuries in therapy. The main goal of hand therapy was to maximise the patients' level of participation in life; therefore, the DASH and the MHQ matched the study as the instruments assisted in measuring how much the patients level of participation in life has improved. The MHQ measured aesthetics, could assess the left and right hand separately and contained questions relating specifically to the hand. The DASH was suitable for any type of upper extremity injury and was widely accepted, promoting the exchangeability of results in clinical evaluation and research. Validity discusses the capability of an instrument to measure what it is supposed to measure (Lakshmi & Mohideen, 2013). Internal Validity refers to how well the study was created and run, precise measurement of variables, and the researcher's amount of confidence that the alteration in the dependent variable was affected by the independent variable (McDermott, 2011). External Validity is a study's ability to have the results generalized to the population (McDermott, 2011). The internal consistency has been considered to be good when the Cronbach's α was between 0.70 and 0.95. Cronbach's α was used to check the reliability of the study. Internal consistency is typically a measure based on the correlations between different items on the same test, which in this study was the DASH and MHQ. It measured whether several items that propose to measure the same general construct produce similar scores.

3.9.3 QUALITATIVE DATA ANALYSIS

In describing the qualitative data analysis, the researcher opted for thematic analysis to "systematize and increase the traceability and verification of the analysis" (Nowell,

Norris, White & Moules, 2017, p.1). The steps in qualitative analysis included: (1) preliminary exploration of the data by reading through the transcripts and writing memos; (2) coding the data by segmenting and labelling the text; (3) using codes to develop themes by combining similar codes; (4) connecting and interrelating themes; and (5) constructing a narrative (Creswell, 2002). According to Braun and Clarke (2006), thematic analysis is a procedure used to identify, analyse and to report themes within the data collected. The deductive approach method has been applied where the ICF framework has been used to direct and organize the findings of the study. The following steps described the process of qualitative analysis:

Step one entailed the researcher to become familiar with the data collected. It was vital for the researcher to engage with data, which entailed repetitive, active reading of the data. The researcher has embarked on the process of note-taking, which assisted with the process of generating codes. The researcher then read all the transcripts of all the participants of the study. This process aided in the researcher becoming familiar with the data. This has also allowed the researcher to unconsciously group similar data together.

Step two has required the researcher to encode the information that is considered necessary to the research question. Codes aided in recognising detailed fundamental data, which has emerged as interesting to the researcher. This process has enabled the development of themes, which has been required for the next step of thematic analysis. From step one, the researcher has been able to manually, group similar data within various word documents, one-word document per code. These codes have been achieved as the researcher has colour coded the transcripts, with each colour representing a specific code. Once all transcription data have been placed within a

specific code, each code has been named. These naming of the codes has led to the categories of the study. Each category of the study has contained codes, which are similar and relatable to each other.

Step three has entailed the researcher to establish main and sub-themes that have resulted through using the codes. However, it was crucial not to discard of any information as the following step involved the researcher reviewing whether the themes were necessary to be linked, improved or removed.

Step four has required the researcher to evaluate the themes. At this particular stage, the themes have been polished in order for the essential themes to have become evident.

Step five has required the researcher to name the themes; thereafter, the researcher has defined the themes. During this phase, the researcher has been obligated to recognize the principal of each theme, which comprised of identifying the features of the data that all the themes captured. The researcher needed to not only paraphrase the data but also needed to be able to expand on the reasons as to why these themes were interesting. Each theme has needed to be examined in-depth, which has assisted each theme to be in concert with each other.

Step six entailed the researcher to conclude and evaluate each theme which then resulted in the thesis discussion. It was crucial that the discussion included evidence, which was concise, and to the point while avoiding repetition and offering, an invigorating read.

3.10 TRUSTWORTHINESS OF THE QUALITATIVE ANALYSIS

Trustworthiness denotes to the reliability and accuracy of the data found in the focus groups. According to Babbie and Mouton (2002), trustworthiness denotes to the concept, which certifies objectivity in qualitative research designs. Babbie and Mouton identified these strategies, namely: credibility, dependability, and confirmability within qualitative research (Kennedy & Julie, 2013). Below summarizes the strategies that were used to ensure that trustworthiness was maintained within the study (Mthobeni & Peu, 2013).

3.10.1 CREDITABILITY

Credibility relates to the truth of the data or the participant understandings and the interpretation and representation of them by the researcher. The researcher expressing his or her experiences as a researcher and confirming the research findings with the participants tend to improve credibility (Cope, 2014). The strategies that were implemented during the process of creditability are discussed below.

Prolonged engagement: the questions relating to the participants' engagement in occupations were asked in two separate sessions. The researcher printed out copies of the questions for each participants' hospital file prior to the intervention. The intervention sessions took place in the occupational therapy department. The treatment table and chairs in the occupational therapy department were used. The researcher cleaned and tidied the treatment rooms before the intervention. The intervention sessions were an hour long. The intervention session consisted of the researcher, participant, and the translator. The researcher informed and asked the translator prior to the interventions if it was possible for them to translate in the sessions. The researcher charged the voice recorder before the intervention session.

The researcher debriefed with the supervisor after all the intervention sessions to discuss the progress of the study.

Triangulation: questions relating to the participants engagement in occupations, medical notes and observations were used for multiple data sources.

Peer debriefing: the researcher had continual meetings with the supervisor to discuss the progress of the study.

3.10.2 DEPENDABILITY

Dependability discusses the constancy of the data over comparable settings. This can be attained when another researcher approves with the decision trails at each stage of the research process (Cope, 2014). The strategies that were implemented during the process of dependability are discussed below.

Descriptive data: The data recorded within the questions relating to the participants' engagement in occupations were recorded and transcribed verbatim. The researcher has had meetings and discussions with the supervisor to discuss the data collection and results to reach an agreement of the findings. Since the researcher is also the occupational therapist in the setting it resulted in the same person collecting data and administering the intervention. This, however, could lead to potential bias. Potential bias in this study was controlled by the researcher recording the initial and last session with a voice recorder. This recording was given to the supervisor to double check that no potential bias was done during these sessions. All sessions were also recorded on notes which was also given to the supervisor. Prior to the intervention sessions, the researcher reserved a treatment room in the occupational therapy department amongst her colleagues for the study to take place. The researcher used VLC, where she adjusted the speed of the recording to slow so that she could type while listening

to the voice recording. The researcher typed out the voice recordings in Microsoft office.

3.10.3 CONFIRMABILITY

Confirmability discusses the researcher's capability to determine that the data represent the participants' responses and not the researcher's prejudices or perspectives. The researcher can establish confirmability by unfolding how conclusions and interpretations were established and demonstrating that the findings were resulting directly from the data (Cope, 2014). The strategies that were implemented during the process of confirmability are discussed below.

Audit trail: The research supervisor has checked the quality and trailed the development of the study. The researcher met up with her supervisor to present the category and theme names so that the supervisor could give the approval to start writing up chapter four.

3.10.4 TRANSFERABILITY

Transferability denotes to findings that can be realistic to other settings or groups (Cope, 2014). The strategies that were implemented during the process of transferability are discussed below.

Descriptive data: Data saturation was achieved during the data collection.

Purposive sample: The researchers have purposively selected participants that met the inclusion criteria of the study. The researcher printed out a permission letter for the CEO of the hospital in order to use the patients of the hospital in the study. The researcher also got permission from the Eastern Cape Department of Health for the study to take place at the hospital. The researcher visited the doctors in the out-patient

department to inform them of the study and to ask them to refer patients to occupational therapy department that would benefit from the intervention.

3.11 ETHICS STATEMENT

Ethical approval was sought from the Biomedical Research Ethics Committee in the University of the Western Cape (BM18/7/21) (Appendix 1). The participants have been made aware of the study beforehand, and they have decided whether or not they wanted to participate in the study as explained in the information sheet which has ensured autonomy and beneficence (Appendix 6). Furthermore, the participants have been informed that the results of the study will be kept confidential, and their names will not be mentioned in the study as part of anonymity as highlighted in the POPI Act 2018. Therefore, the participants have signed an informed consent, which indicated that they wanted to take part in the study (Appendix 7). Prior to signing the informed consent, the researcher read what was written on the informed consent and the translator translated what the researcher read to the participants which allowed the participants to understand what they were signing and being aware of what they were giving consent to. The participants who were unable to sign or write their names on the informed consent were asked to sign with an “X”. The researcher has ensured that the quality and integrity of the study was always honoured. According to Dantzker and Hunter (2011), using integrity is where the researcher accepts the findings of the study and reports them as discovered from the participants. The researcher has store all the data collected for the study on the researchers’ laptop and will be protected with a password for a period of 5 years. The researcher has ensured the participants who took part in the study, did so voluntarily, and they were able to withdraw at any time without any repercussion. In case of any emergency, the participants have been referred to the necessary departments, which have been the OPD clinic, or the social

worker, which has ensured nonmaleficence. In terms of justice, it would be reasonable for the participants to obtain the benefit of the research conducted. Therefore, participants were receiving treatment weekly instead of monthly to assist in improving their hand injuries and ensuring justice. After all, the participants would have been referred to occupational therapy for the treatment of their hand injury and would have been booked on a monthly basis.

CHAPTER FOUR

RESULTS

4 INTRODUCTION

Chapter four presents the results of the quantitative and qualitative phases of the current study.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

Twenty-five participants with hand injuries participated in the pre-tests while 11 who were part of the post-test surveys, as presented in Table 2. The researcher placed both the pre-tests as well the post-tests of the MHQ in one sheet on the SPSS and this is why the number of participants is displayed as 36 (25 pre-test and 11 post-test). The DASH pre- and post-tests were placed on two different sheets on the SPSS, hence, 25 participants for the DASH.

Table 2: Socio-demographic characteristics of the participants

Variable	Frequency	Percentage
Gender		
Female	6	16.7%
Male	30	83.3%
Ages		
20 – **29**	17	47.3%
30 – 39	11	30.6%
40 – 49	4	11.2%
50 – 60	4	11.2%
Race		
African	36	100%
Marital status		
Single	23	63.9%
Married	13	36.1%
Hand dominancy		
Right	30	83.3%
Left	6	16.7%
Level of education		
Less than high school	19	52.8%
High school/TVET	11	30.6%
Diploma	3	8.3%

Degree	3	8.3%
Household income		
R1 – R800	7	19.4%
R800 – R1600	7	19.4%
R1601 – R3201	9	25%
R3201 – R6400	6	16.7%
R6401 –R12800	3	8.3%
R12800 – R12801	2	5.6%
High income	2	5.6%

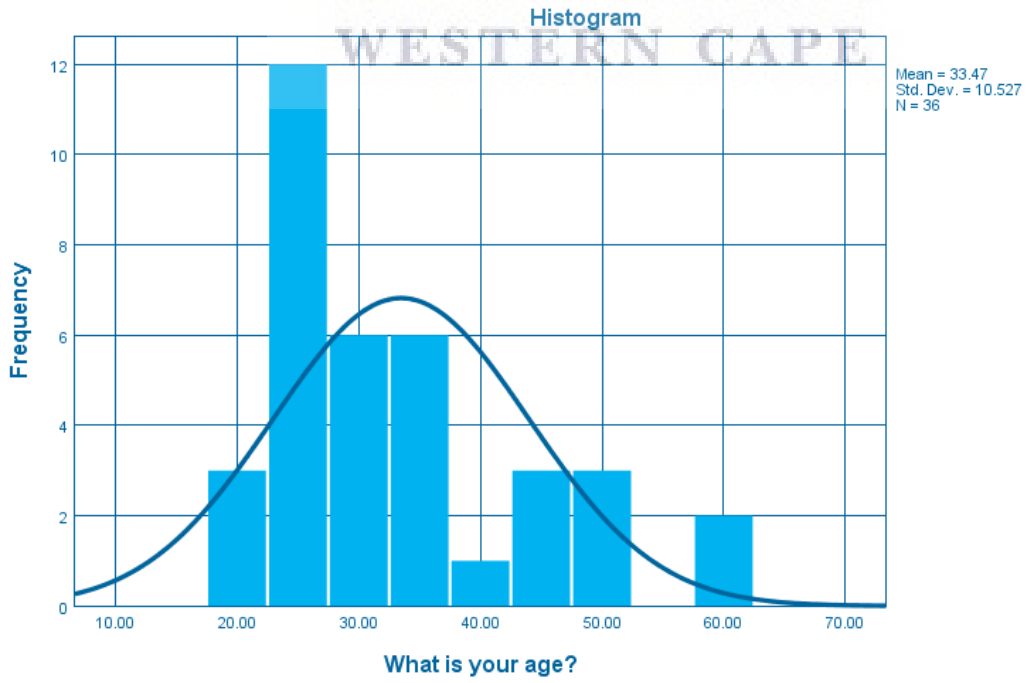
The participants' ages ranged between 20 and 60, with the majority being between the ages of 20 and 40. The majority of the participants were male (83.3%), and 16.7% of the participants were female. This indicates that hand injuries were more common amongst males. Majority of the participants (100%) who participated in the study were African. This suggests that the majority of people living in Mthatha are African and using public health services. Participants were given four options when asked about their marital status. The four options were: single, married, divorced or separated. Two-thirds of the participants (63.9%) were single, and 36.1% of the participants were married. This indicates that the majority of the participants were single. Since the majority of the participants were young adults, there is a link between marital status and age, as well as marital status and gender. Majority of participants who participated in the study were right-hand dominant. Three participants (8.3%) were unemployed before their hand injuries. Less than half of the participants, 47.2% were unemployed after they sustained their hand injuries. Majority of the participants in the study had a low level of education, as they did not complete high school. More than half of the participants (52.8%) indicated that their highest level of education was less than high school graduate. Some of the participants (30.6%) indicated that their highest level of education was high school graduate or TVET. 8.3% of the participants indicated that their highest level of education was a diploma. 8.3% of the participants indicated that

their highest level of education was a degree. This shows that the majority of the participants in the study had a low level of education, as they did not complete high school. Majority of the participants came from low earning household incomes. 25.0% of the participants indicated that their household income for the month was approximately between R1601-R3201. 19.4% of the participants indicated that their household income for the month was between R1-R800. This indicates that the majority of the participants came from low earning household incomes. The participants were either right-handed, or left-handed. 83.3% of the participants were right-handed, and 16.7% of the participants were left-handed. This illustrates that the majority of participants who participated in the study were right-hand dominant.

4.1.1 PARTICIPANTS' AGES

The participants' ages ranged between 20 and 60. The mean age of the participants was 33.47 years with a standard deviation of 10.37, as presented in Figure 6.

Figure 6: Participant ages



4.1.2 PARTICIPANTS' JOB BEFORE HAND INJURIES

Concerning the participants' job before hand injuries, it was noted that the participants used to engage in a variety of jobs that assisted them with the source of income. The types of jobs that the participants engaged in before they sustained hand injuries are presented in Table 3. The table below indicates that three participants (8.3%) were unemployed before their hand injuries (Table 3). The more common jobs amongst the participants were taxi drivers (11.2%) and mechanics (8.3%).

Table *3*: Participants' jobs before hand injuries

Job	Frequency	Percentage
Bodyguard/scholar	1	2.8%
Brick maker	1	2.8%
Builder	2	5.6%
Car mechanic	3	8.3%
Car polisher	2	5.5%
Counsellor	1	2.8%
Domestic worker	2	5.6%
Doorman for BNB	2	5.6%
Electrical work	1	2.8%
Fencing	1	2.8%
Housekeeper BNB	1	2.8%
Housewife	1	2.8%
Logistic and installation	2	5.6%
Medical doctor	2	5.6%
Packer	1	2.8%
Porter	1	2.8%
Scholar	2	5.6%
Taxi driver, mechanic	1	2.8%
Taxi driver	2	5.6%
Taxi driver, roofing, mechanic	1	2.8%

Tiling and ceilings	1	2.8%
Unemployed	3	8.3%
Welder	1	2.8%
Welder, made window frames	1	2.8%

4.1.3 PARTICIPANTS' CURRENT JOBS AFTER HAND INJURIES

Participants were asked to describe the type of jobs that they are currently doing after they sustained hand injuries. Less than half of the participants (47.2%) indicated that they were unemployed after they sustained their hand injuries (Table 4). More than half of the participants (50.4%) were employed after their hand injuries, and 5.6% of the participants were taking a break from their jobs after their hand injuries.

Table 4: Participants' current jobs after hand injuries

Variable	Frequency	Percentage
Builder	2	5.6%
Counsellor	1	2.8%
Currently taking a break	2	5.6%
Did not go back to work	1	2.8%
Doorman for a BnB	1	2.8%
Dropped out of school	1	2.8%
Housewife	1	2.8%
Logistics and installations	1	2.8%
Mechanic (light duties)	1	2.8%
Medical doctor	2	5.6%
Packer	1	2.8%
Porter	1	2.8%
Scholar	2	5.6%
Taxi driver	2	5.6%
Unemployed	17	47.2%

4.2 TIME TAKEN AFTER SURGERY BEFORE RETURNING TO WORK

Regarding the time taken after surgery before returning to work, it was noted that less than half of the participants (52.8%) did not return to work. However, six participants (16.7%) indicated that they returned to work three months after the surgery. Nearly, 13.9% of the participants stated that they returned to work immediately after the surgery (Table 5).

Table 5: Time taken to return to routine jobs after surgery

Variable	Frequency	Percentage
2 months	1	2.8%
3 months	6	16.7%
7 days	1	2.8%
After a week	1	2.8%
After two weeks	1	2.8%
Did not return to work	19	52.8%
Dropped out of school	1	2.8%
Immediately	5	13.9%
Unemployed	1	2.8%

4.2.1 TIME TAKEN TO RETURN TO THE SAME JOB AS BEFORE THE HAND INJURY

Regarding the time taken to return to the same job as before the participants sustained their hand injuries. It was noted that 52.8% of the participants did not return to work. Nearly 16.7% of the participants indicated that it took them three months to return to the same job they were doing before their hand injuries. However, 11.1% of the participants indicated that they returned to same jobs they were doing with immediate effect (Table 6).

Table *6*: Time taken to return to the same job as before the hand injury

Variable	Frequency	Percentage
2 months	1	2.8%
2 weeks	1	2.8%
3 months	6	16.7%
7 days	1	2.8%
After a week	1	2.8%
Did not return to work	19	52.8%
Dropped out of school	1	2.8%
Immediately	4	11.1%
No surgery was done	1	2.8%
Unemployed	1	2.8%

4.3 RESULTS FROM THE MHQ AND DASH

The two questionnaires asked the participants about their views on their hands and their health. Participants were asked questions and were expected to mark their answer 1-5. Options 1-5 were labelled, and participants were expected to select a number between 1-5, which suited them the best. Questionnaires were administered before and after intervention with the participants. Mean scores and standard deviations are reported to summarise the results. A higher score of the means indicates a lower level of agreement from the participants, and a lower score of the means indicates a higher level of agreement from the participants.

4.3.1 RESULTS FROM THE MHQ

Section 1 of the MHQ referred to the function of the participants' hands/wrists during the past week. The questions related to both right and left hands/wrists. Table 7 represents the pre and post questionnaire results regarding the function of the participants' right and left hands/wrists. The table below represents the participants' functioning of their left and right hands/wrists (Table 7). Participants were asked

questions on the left of the table and were expected to mark their answers from 1-5, where 1= very good, 2= good, 3= fair, 4= poor and 5= very poor. The table displays the pre- and post-questionnaire means and standard deviations. The post questionnaire had a smaller standard deviation compared to the pre-questionnaire, which indicates that the participants had a more consistent reaction to the intervention received.

Table 7: Hands/wrists function

Items	Pre-test X±SD	Post-test X±SD
How well did your right-hand work?	2.96±1.85	1.63±1.02
How well did your right fingers work?	2.68±1.74	1.54±0.93
How well did your right wrist work?	2.44±1.69	1.73±1.27
How was the strength in your right hand?	2.72±1.79	2.09±1.38
How was the sensation in your right hand?	1.96±1.24	1.27±.90
How well did your left-hand work?	2.80±1.73	1.64±1.03
How well did your left fingers move?	2.56±1.58	1.55±.93
How well did your left wrist move?	2.40±1.71	1.64±1.21
How was the strength in your left hand?	2.76±1.69	1.64±1.30
How was the sensation in your left hand?	2.16±1.31	1.37±.92

The average item mean value for section 1 was pre-questionnaire 2.54 (SD= 1.63) and post-questionnaire 1.60 (SD= 1.08). 'How was the sensation in your right hand?' had the lowest pre- and post-questionnaire mean (M= 1.96; SD= 1.24) and (M= 1.27; SD= .90). This lowest mean score in the pre- and post-questionnaire indicates that the participants mostly felt like sensation in their right hands were not considered as a problem to them. The highest mean value was for item 'how well did your right-hand

work?' in the pre-questionnaire (M= 2.96; SD= 1.85) and in the post-questionnaire 'how well did your right-hand work?' scored (M= 1.63; SD= 1.02). This indicates that participants felt like there was an improvement in the way their right hands worked after they have received the occupational therapy intervention as the post-questionnaire mean value is lower compared to the pre-questionnaire. 'How well did your left-hand work?' scored (M= 2.80; SD= 1.73) in the pre-questionnaire and in the post-questionnaire (M= 1.63; SD= 1.02). This result shows that the participants considered an improvement in the way their left hand worked after the occupational therapy intervention. In the pre-questionnaire, 'how was the strength in your left hand?' scored (M= 2.76; SD= 1.69) and the post-questionnaire (M= 1.63; SD= 1.28). There is a lower mean score in the post-questionnaire compared to the pre-questionnaire, which shows that the participants believed that the strength in their left hand has improved. 'How was the strength in your right hand?' scored (M= 2.72; SD= 1.79) in the pre-questionnaire and in the post-questionnaire 'how was the strength in your right hand?' scored (M= 2.09; SD= 1.37). This result indicates that participants felt like there was some improvement in the strength of their right hand as the post-questionnaire results are lower compared to the pre-questionnaire results.

Section 2 of the questionnaire referred to the participants' ability to perform specific tasks during the past week- the questions related to both right and left hands as well as both of their hands. Table 8 represents the pre and post questionnaire results regarding the participants' ability to perform specific tasks.

Table *8*: Ability to perform specific tasks during the past week

Items	Pre-test X±SD	Post-test X±SD
How difficult was it to turn a knob with your right hand?	2.52±1.87	1.55±1.04
How difficult was it to pick up a coin with your right hand?	2.20±1.76	1.73±1.42
How difficult was it to hold a glass of water with your right hand?	2.08±1.66	1.27±.90
How difficult was it to turn a key in a lock with your right hand?	2.36±1.82	1.73±1.42
How difficult was it to hold a frying pan with your right hand?	2.44±1.89	1.73±1.42
How difficult was it to turn a knob with your left hand?	2.72±1.88	1.55±1.29
How difficult was it to pick up a coin with your left hand?	2.52±1.85	1.55±1.29
How difficult was it to hold a glass of water with your left hand?	2.48±1.83	1.36±1.21
How difficult was it to turn a key in a lock with your left hand?	2.76±1.96	1.45±1.21
How difficult was it to hold a frying pan with your left hand?	2.92±1.98	1.45±1.21
How difficult was it to open a jar with both of your hands?	3.40±1.41	1.55±.82
How difficult was it to button your shirt with both of your hands?	2.92±1.68	1.64±1.03
How difficult was it to eat with a knife/fork with both of your hands?	3.44±1.80	2.45±1.75
How difficult was it to carry a grocery bag with both of your hands?	3.52±1.45	1.81±1.25
How difficult was it to wash dishes with both of your hands?	3.40±1.63	1.45±.93
How difficult was it to wash your hair with both of your hands?	2.76±1.69	1.45±.93
How difficult was it to tie shoelaces/knots with both of your hands?	2.80±1.61	1.64±1.03

The above table represents the participants' ability to perform certain tasks during the past week. Participants were asked questions on the left of the table. They were expected to mark their answers from 1-5, 1= not at all difficult, 2= a little difficult, 3= somewhat difficult, 4= moderately difficult and 5= very difficult. The average item mean

value for section 2 was pre-questionnaire 2.77(SD= 1.75) and post-questionnaire 1.60 (SD= 1.18). 'How difficult was it to hold a glass of water with your right hand?' scored the lowest mean score (M= 2.08; SD= 1.65) in the pre-questionnaire. In the post-questionnaire, 'how difficult was it to hold a glass of water with your right hand?' scored slightly less than the pre-questionnaire (M= 1.27; SD= 0.90), which indicates that improvement was noted. The highest mean value was for item 'how difficult was it to carry a grocery bag with both of your hands?' in the pre-questionnaire (M= 3.52; SD= 1.44) and the post-questionnaire 'how difficult was it to carry a grocery bag with both of your hands?' score (M= 1.81; SD= 1.25). This indicates that participants felt like there was an improvement in the difficulty of carrying a grocery bag with both of their hands after they have received the occupational therapy intervention. 'How difficult was it to eat with a knife/fork with both of your hands?' scored (M= 3.44; SD= 1.80) in the pre-questionnaire and (M= 2.45; SD= 1.75) in the post-questionnaire. This result indicates that participants considered an improvement in the difficulty of eating with a knife/fork with both of their hands. 'How difficult was it to wash dishes with both of your hands?' scored (M= 3.40; SD= 1.63) in the pre-questionnaire, and the post-questionnaire (M= 1.45; SD= .93). There is a lower mean score in the post-questionnaire compared to the pre-questionnaire, which shows that the participants believed that the difficulty in washing dishes with both of their hands improved after the intervention.

Section 3 of the questionnaire refers to how the participants did their everyday work (including housework and schoolwork) in the past four weeks. Table 9 represents the pre and post questionnaire results regarding the participants' performance in their routine work in the last four weeks.

Table 9: Participants' performance in their routine work over the past four weeks

Items	Pre-test X±SD	Post-test X±SD
How often were you unable to do your work because of problems with your hand?	2.16±1.14	3.27±1.56
How often did you have to take it shorten your workday because of problems with your hand?	2.28±1.21	3.73±1.35
How often did you have to take it easy at work because of problems with your hand?	2.28±1.17	3.55±1.29
How often did you accomplish less in your work because of problems with your hand?	2.12±1.01	3.27±1.42
How often did you take longer to do the tasks in your work because of problems with your hand?	2.00±0.96	3.09±1.30

The above table represents the participants' performance in their regular work over the past four weeks. Participants were asked questions on the left of the table and were expected to mark their answers from 1-5, 1= always, 2= often, 3= sometimes, 4= rarely and 5= never. The average item mean value for section 3 was pre-questionnaire 2.16 (SD= 1.09) and post-questionnaire 3.38 (SD= 1.38). 'How often did you take longer to do the tasks in your work because of problems with your hand?' scored the lowest pre-questionnaire mean (M= 2.00; SD= .95). In the post-questionnaire, 'how often did you take longer to do the tasks in your work because of problems with your hand?' scored (M= 3.09; SD= 1.30). This result indicates that the participants felt that after they have received the occupational therapy intervention, they did not have to take as long at work to do their work tasks as compared with before they received the occupational therapy intervention. 'How often did you have to shorten your workday

because of problems with your hand?' scored (M= 2.28; SD= 1.20) in the pre-questionnaire. In the post-questionnaire, 'how often did you have to shorten your workday because of problems with your hand?' scored (M= 3.72; SD= 1.34). This result indicates that the participants noted improvement in the post-questionnaire and felt as if they did not have to shorten their workdays often anymore.

Section 4 refers to how much pain the participant had in their hands/wrists during the past week. The questions related to both right and left hands/wrists. Table 10 represents the pre and post questionnaire results regarding the participants' amount of pain felt in their hands/wrists.

Table *10*: Pain during the past week

Items	Pre-test X±SD	Post-test X±SD
How often did you have pain in your right hand?	3.64±1.68	4.27±1.01
Please describe the pain you had in your right hand?	2.91±1.14	2.25±1.26
How often did the pain in your right hand interfere with your sleep?	3.91±1.38	5.00±.00
How often did the pain in your right hand interfere with your daily activities (such as eating and bathing)?	3.09±1.38	4.75±.50
How often did the pain in your right hand make you unhappy?	2.82±1.54	4.25±1.50
How often did you have pain in your left hand?	3.20±1.76	4.45±.93
Please describe the pain you had in your left hand?	3.36±1.22	1.67±.58
How often did the pain in your left hand interfere with your sleep?	2.86±1.56	5.00±.00
How often did the pain in your left hand interfere with your daily activities (such as eating or bathing)?	2.29±1.07	4.33±1.15
How often did the pain in your left hand make you unhappy?	2.36±1.08	4.33±1.15

The above table represents how much pain the participant had during the past week. Participants were asked questions on the left of the table and were expected to mark their answers from 1-5, the five options for question 1, 3, 4, 5, 6, 8, 9, and 10 were as follows: 1= always, 2= often, 3= sometimes, 4= rarely and 5= never. The five options for question 2 and 7 were as follows: 1= very mild, 2= mild, 3= moderate, 4= severe and 5= very severe. The average item mean value for section 4 was pre-questionnaire 3.04 (SD= 1.37) and post-questionnaire 4.03 (SD= 0.80). 'How often did the pain in your left hand interfere with your daily activities (such as eating or bathing)?' scored the lowest mean value in the pre-questionnaire (M= 2.28; SD= 1.06). In the post-questionnaire, 'how often did the pain in your left hand interfere with your daily activities (such as eating or bathing)?' scored (M= 4.33; SD= 1.15). This score indicates that the participants believed that the pain in their left hand subsided during their daily activities after they have received the occupational therapy intervention. 'How often did the pain in your left hand interfere with your sleep?' scored (M= 2.28; SD= 1.06) in the pre-questionnaire. In the post-questionnaire, 'how often did the pain in your left hand interfere with your sleep?' scored (M= 5.00; SD= .00). This score indicates that after the occupational therapy intervention, none of the participants felt like the pain in their left hand interfered with their sleep. Question 2, 'please describe the pain you had in your right hand?' scored (M= 2.90; SD= 1.13) in the pre-questionnaire. In the post-questionnaire, 'please describe the pain you had in your right hand?' scored (M= 2.25; SD= 1.25). This result indicates that the participants felt improvement in the level of pain they felt in their right hands after the intervention has taken place. Question7, 'please describe the pain you had in your left hand?' scored (M= 3.35; SD= 1.21) in the pre-questionnaire. In the post-questionnaire, 'please

describe the pain you had in your left hand?' scored (M= 1.66; SD= .57). Therefore, question 7 results indicate that there was improvement found in the level of pain felt in the participants' left hand after the intervention.

Section 5 refers to the appearance of the participant's hand during the past week. The questions related to both right and left hands. Table 11 represents the pre and post questionnaire results regarding the participants' appearance of their right and left hand during the past week.

Table *11*: Appearance of right and left hand during the past week

Items	Pre-test X±SD	Post-test X±SD
I am satisfied with the appearance of my right hand.	2.25±1.73	1.82±1.25
The appearance of my right hand sometimes made me feel uncomfortable in public.	3.72±1.67	3.91±1.45
The appearance of my right hand made me feel depressed.	3.84±1.40	4.09±1.30
The appearance of my right hand interfered with my normal social activities.	4.12±1.13	4.18±1.33
I am satisfied with the appearance of my left hand.	2.92±1.73	1.55±.93
The appearance of my left hand sometimes made me feel uncomfortable in public.	3.68±1.41	4.27±1.01
The appearance of my left hand made me feel depressed.	3.68±1.41	4.55±.69
The appearance of my left hand interfered with my normal social activities.	3.68±1.38	4.55±.69

The above table represents the appearance of the participants' right and left hands during the past week. Participants were asked questions on the left of the table and were expected to mark their answers from 1-5, 1= strongly agree, 2= agree, 3= neither

agree nor disagree, 4= disagree and 5= strongly disagree. The average item mean value for section 5 was pre-questionnaire 3.52 (SD= 1.48) and post-questionnaire 3.61 (SD= 1.08). 'The appearance of my right hand made me feel depressed.' scored in the pre-questionnaire (M= 3.84; SD= 1.40) and the post-questionnaire (M= 4.09; SD= 1.30). This result indicates that the participants felt less depressed in the post-questionnaire when asked whether the appearance of their right hand made them feel depressed. 'I am satisfied with the appearance of my right hand.' scored in the pre-questionnaire (M= 2.52; SD 1.73) and the post-questionnaire (M=1.81; SD= 1.25). This result indicates that the participants felt more satisfied with the appearance of their right hand after they have received the occupational therapy intervention. 'The appearance of my left hand interfered with my normal social activities.' scored in the pre-questionnaire (M= 3.68; SD= 1.37) and the post questionnaire (M= 4.54; SD= .68). This result indicates that the average participant felt as if the interference of the appearance of their left hand regarding social activities has improved in the post-questionnaire.

Section 6 refers to the participants' level of satisfaction with their hands/wrists during the past week. The questions related to both right and left hands. Table 12 represents the pre and post questionnaire results regarding the participants' level of satisfaction regarding their hands or wrists during the past week.

Table *12*: Level of satisfaction of right and left hands/wrists

Items	Pre-test X±SD	Post-test X±SD
During the past week, were you satisfied with the overall function of your right hand?	2.68±1.89	1.55±1.21
During the past week, were you satisfied with the motion of the fingers in your right hand?	2.52±1.78	1.45±1.21
During the past week, were you satisfied with the motion of your right wrist?	2.32±1.75	1.73±1.62
During the past week, were you satisfied with the strength in your right hand?	2.68±1.89	1.55±1.21
During the past week, were you satisfied with the pain level of your right hand?	2.40±1.85	1.82±1.60
During the past week, were you satisfied with the sensation of your right hand?	2.12±1.69	1.64±1.21
During the past week, were you satisfied with the overall function of your left hand?	3.04±1.88	1.45±.93
During the past week, were you satisfied with the motion of the fingers in your left hand?	3.00±1.85	1.55±1.21
During the past week, were you satisfied with the motion of your left wrist?	2.48±1.87	1.82±1.60
During the past week, were you satisfied with the strength in your left hand?	3.12±1.94	1.55±1.21
During the past week, were you satisfied with the pain level of your left hand?	2.92±1.85	1.45±.93
During the past week, were you satisfied with the sensation of your left hand?	2.28±1.57	1.27±.47

The above table represents the participants' satisfaction with their right and left hands/wrists during the past week. Participants were asked questions on the left of the table. They expected to mark their answers from 1-5, 1= very satisfied, 2= somewhat satisfied, 3= neither satisfied nor dissatisfied, 4= somewhat dissatisfied and 5= very dissatisfied. The average item mean value for section 6 was pre-questionnaire 2.63 (1.817) and post-questionnaire 1.56 (1.20). 'During the past week, were you

satisfied with the overall function of your left hand?' scored in the pre-questionnaire (M= 3.04; SD= 1.88) and the post questionnaire (M= 1.45; SD= .93). This result indicates that the average participant felt as if they felt more satisfied with the overall function of their left hand in the post-questionnaire results. 'During the past week, were you satisfied with the strength in your left hand?' scored in the pre-questionnaire (M= 3.12; SD= 1.94) and the post-questionnaire (M= 1.54; SD= 1.21). This result indicates that the participants believed that the strength in their left hand improved after they have received the occupational therapy intervention. 'During the past week, were you satisfied with the motion of the fingers in your left hand?' scored in the pre-questionnaire (M= 3.00; SD= 1.84) and the post-questionnaire (M= 1.54; SD= 1.21) which indicates that the participants felt improvement in the motion of the fingers in their left hands after they have received the occupational therapy intervention.

4.3.2 CORRELATIONS OF THE MHQ

In this section of the results, the correlations that were found to be statistically significant are presented.

Table 13: Correlations between personal factors

Demographic factor	Spearman's rho	p-value
Family income and Highest level of education	.562	.000
Education and Marital status	-.494	.002
Marital status and age	.383	.021

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations were computed among two MHQ scales on data for 36 participants. The correlation between the approximate family income and the participants' highest level of education was found to have a strong positive correlation and to be statistically significant (r_s = .56, n= 36, p< .01). The strong positive correlation implies that the two variables being tested are moving in the same direction. This assumes that an increase in approximate family income is associated with an increase level of education. The moderate negative correlation between the participants' highest level of education and their marital status implies that the two variables being tested are moving in opposite directions. This means that an increase in the level of education is associated with a decreased marital status. The moderate positive correlation between marital status and age implies that the two variables being tested are moving in the same direction. This assumes that an increase in marital status is associated with an increase in age.

Table 14: Correlations between personal factors and MHQ's item (n=36)

Correlations	*Spearman's rho*	*p-value*
Family income and Satisfaction with the motion of the rights wrist	-.329	.050
Highest level of education and Satisfaction with the appearance of right hand	-.492	.002
Highest level of education and Satisfaction with the motion of the fingers of the right hand	-.505	.002
Marital status and Satisfaction with the motion of the fingers of the right hand	.329	.050

Gender and Appearance of the right-hand causing feelings of depression	-.355	.034
Gender and Appearance of the right-hand causing interference with regular social activities	-.377	.023
Age and Appearance of the right-hand causing feelings of being uncomfortable in public	-.341	.042
Age and Appearance of the right-hand causing interferences with normal social activities	-.333	.047

*. Correlation is significant at the 0.05 level (2-tailed).

The calculation of the relation between family income and satisfaction with the motion of the right wrist is depicted in Table 14. The results shows that Spearman coefficient (r_s) =-0.329 for 36 samples. This means that there is a negative correlation. The negative correlation implies that the two variables being tested are moving in opposite directions. The test of relation significance indicates that probability Sig. (2-tailed) is 0.05. This deduces that an increase in approximate family income is associated with a decrease in satisfaction with the motion of the right wrist. The strong negative correlation between the participants' highest level of education and their level of satisfaction with the appearance of their right hand implies that the two variables being tested are moving in the opposite directions. This determines that an increase in level of education is associated with a greater level of satisfaction with the appearance of their right hand.

The correlation between the participants' highest level of education and their level of satisfaction with the motion of their fingers in their right hand was found to have a strong negative correlation and to be statistically significant (r_s = -.51, n= 36, p< .01). The strong negative correlation implies that the two variables being tested are moving in opposite directions. This implies that an increase in the level of education is associated with a greater level of satisfaction with the motion of their fingers in their right hand. The moderate positive correlation between the participants' marital status and their satisfaction level with the motion of their fingers in their right hand implies that the two variables being tested are moving in tandem. This assumes that an increase in marital status is associated with an increase satisfaction level with the motion of their fingers in their right hand. There is moderate negative correlation regarding the association with gender and the participants' feelings towards depression regarding the appearance of their right hand. There is a moderate negative correlation with regards to the association with gender and the participants' feelings towards the interference of normal social activities regarding the appearance of their right hand. The moderate negative correlation between the participants' age and their feelings towards the interference of regular social activities regarding the appearance of their right hand implies that the two variables being tested are moving in different directions. This deduces that increasing age is associated with a decrease in the participants' feelings towards the interference of normal social activities regarding the appearance of their right hand.

4.4 RESULTS FROM THE DASH

Section 1: Question 1-21 of the DASH refers to participants abilities to participate in various activities during the last week. Table 15 represents the pre and post questionnaire results regarding the participants' abilities to participate in various activities during the previous week.

Table 15: Ability to participate in activities

Items	Pre-test X±SD	Post-test X±SD
Open a tight or new jar	3.88±120	1.82±1.08
Write	3.44±1.61	2.09±1.45
Turn a key	3.96±1.37	1.91±1.38
Prepare a meal	3.28±1.67	1.64±1.43
Push open a heavy door	3.80±1.41	1.55±1.04
Place an object on a shelf above your head	4.16±1.28	2.00±1.55
Do heavy household jobs	3.84±1.28	2.00±1.55
Garden or outdoor property work	3.88±1.36	2.27±1.68
Make a bed	2.88±1.67	1.73±1.42
Carry a shopping bag or brief case	3.84±1.37	1.55±1.04
Carry a heavy object (over 5kg)	4.44±.96	2.45±1.57
Change a lightbulb overhead	3.84±1.46	2.09±1.58
Wash or blow dry your hair	3.24±1.79	1.27±.90
Wash your back	3.76±1.71	1.64±1.03
Put on a jumper	2.92±1.73	1.45±.93
Use a knife to cut food	3.84±1.60	2.18±1.66
Recreational activities which require little effort	4.00±1.53	1.73±1.42
Recreational activities which require you to take some force or impact through your arm, shoulder, or hand	4.28±1.21	2.09±1.51

Recreational activities in which you move your arm freely	3.72±1.59	1.91±1.38
Manage transport needs	1.40±.91	1.09±.30
Sexual activities	1.40±.96	1.18±.60

The above table represents the participants' abilities to participate in various activities in the last week. Participants were asked questions on the left of the table and were expected to mark their answers from 1-5, 1= no difficulty, 2= mild difficulty, 3= moderate difficulty, 4= severe difficulty and 5= unable. The average item mean value for section 1 was pre-questionnaire 3.51 (SD= 1.41) and post questionnaire 1.60 (SD= 1.26). 'Carry a heavy object (over 5kg)' scored in the pre-questionnaire (M= 4.44; SD= 0.96) and post-questionnaire (M= 2.45; SD= 1.57). This result indicates that the average participant felt as if carrying a heavy object over 5kg became less difficult in the post-questionnaire. 'Recreational activities which require you to take some force or impact through your arm, shoulder or hand' scored in the pre-questionnaire (M= 4.28; SD= 1.20) and the post-questionnaire (M= 2.09; SD= 1.51). This result point toward the participants believed that their abilities to participate in recreational activities which requires impact through their arm, shoulder or hand improved in the post-questionnaire. 'Place an object on a shelf above your head' scored in the pre-questionnaire (M= 4.16; SD= 1.28) and in the post-questionnaire (M= 2.00; SD= 1.54). This result indicates a lower mean value in the post-questionnaire which point to the participants feeling as if placing an object on a shelf above their heads became less difficult to do. 'Recreational activities which require little effort' scored in the pre-questionnaire (M= 4.00; SD= 1.52) and in the post-questionnaire (M= 1.72; SD= 1.42). This result indicates that the participants' ability to participate in recreational activities, which required little effort, became less difficult to do in the post-questionnaire.

Section 2: Question 22 of the DASH refers to social activities. Table 16 represents the pre and post questionnaire results regarding the participants' social activities and whether their arm, shoulder, or hand injury has influenced their social activities.

Table *16*: Social activities

Items	Pre-test X±SD	Post-test X±SD
During the past week, to what extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours, or groups?	2.08±1.32	1.36±.81

The above table represents the participants' feelings regarding their ability to participate in social activities and whether their arm, shoulder or hand injury has influenced their social activities in the past week. Participants were asked the question on the left of the table and were expected to mark their answer from 1-5, 1= not at all, 2= slightly, 3= moderately, 4= quite a bit and 5= extremely. 'During the past week, to which extent has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?' scored in the pre-questionnaire (M= 2.08; SD= 1.32) and the post-questionnaire (M= 1.36; SD= .80). This result indicates that the average participant felt as if their upper limb improved in the post-questionnaire regarding the interference with regular social activities.

Section 3: Question 23 of the DASH refers to work or any other regular activities. Table 17 represents the pre and post questionnaire results regarding the participants' work or any other routine activities, and whether their arm, shoulder or hand injury has influenced their work or any other regular activities.

Table *17*: Work or any other regular activities

Items	Pre-test X±SD	Post-test X±SD
During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	3.68±1.35	1.91±1.14

The above table represents the participants' feelings regarding their ability to participate in work or any other regular activities and whether their arm, shoulder or hand injury has impacted on their work or any other regular activities in the past week. Participants were asked the question on the left of the table and were expected to mark their answer from 1-5, 1= not limited at all, 2= slightly limited, 3= moderately limited, 4= very limited and 5= unable. 'During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?' In the pre-questionnaire, a score of (M= 3.68; SD= 1.34) was computed the participants were moderately limited. However, during the post-questionnaire, it has been noted that a score of (M= 1.90; SD= 1.13) indicated that the participants felt less limited in their work or other regular daily activities in the post-questionnaire results.

Section 4: Question 24-29 *of the DASH refers to pain. Table 18 represents the pre and post questionnaire results regarding the participants' severity of pain felt during the last week.*

Table *18*: Severity of pain

Items	Pre-test X±SD	Post-test X±SD
Arm, shoulder, or hand pain	2.92±1.29	1.64±.67
Arm, shoulder, or hand pain when you do any specific activity	2.92±1.22	1.64±.67
Tingling (pins and needles) in your arm, shoulder, or hand	2.80±1.22	1.64±.67
Weakness in your arm, shoulder, or hand	3.80±1.08	1.73±1.01
Stiffness in your arm, shoulder, or hand	3.16±1.37	1.64±.81
During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder, or hand?	2.04±1.37	1.00±.00

The above table represents the participants' severity of pain felt in the last week. Participants were asked the questions on the left of the table and were expected to mark their answer from 1-5, 1= none, 2= mild, 3= moderate, 4= severe and 5= extreme. The average item mean value for section 4 of the DASH was pre-questionnaire 2.94 (SD= 1.25) and post-questionnaire 1.54 (SD= 0.64). 'Arm, shoulder or hand pain' scored in the pre-questionnaire (M= 2.92; SD= 1.28) and in the post-questionnaire (M= 1.63; SD= .67). This result indicates that the average participant felt as if the severity of pain felt in their arm, shoulder or hand during the last week has improved in severity in the post-questionnaire. 'Weakness in your arm, shoulder or hand' scored in the pre-questionnaire (M= 3.80; SD= 1.08) and in the post-

questionnaire (M= 1.72; SD= 1.00) which reflects that the participants felt an improvement in the severity of weakness in their arm, shoulder or hand within the last week. 'Stiffness in your arm, shoulder or hand' scored in the pre-questionnaire (M= 3.16; SD= 1.37) and in the post-questionnaire (M= 1.63; SD= .80). This result indicates that the participants believed that the severity of stiffness in their arm, shoulder or hand has improved within the last week in the post-questionnaire results. 'During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand?' score in the pre-questionnaire (M= 2.04; SD= 1.36) and the post-questionnaire (M= 1.00; SD= .00). This result indicates that the average participant felt as if they felt no difficulty sleeping because of pain in their arm, shoulder or hand within the last week in the post-questionnaire results.

Section 5: Question 30 of the DASH refers to the participants' feelings of being capable, confident, and useful. Table 19 represents the pre and post questionnaire results regarding the participants' feelings of being capable, confident, and useful.

Table *19*: Feelings of being capable, confident, and useful

Items	Pre-test X±SD	Post-test X±SD
I feel less capable, less confident, or less useful because of my arm, shoulder, or hand problem	3.16±1.40	1.82±1.08

The above table represents the participants' feeling of being capable, confident, and useful. Participants were asked the question on the left of the table and were expected to mark their answer from 1-5, 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, and 5= strongly agree. 'I feel less capable, less confident or less useful because of my arm, shoulder or hand problem' scored in the pre-questionnaire

(M= 3.16; SD= 1.40) and the post-questionnaire (M= 1.81; SD= 1.07). This result indicates that the average participant felt more capable, confident, and useful regarding their arm, shoulder or hand problem in the post-questionnaire results.

Section 6: Optional work and sports module.

Table 20 represents the pre and post questionnaire results regarding the participants' ability to work or play sports and whether their arm, shoulder or hand injury has influenced their ability to work or play sports.

Table *20*: Work and sports

Items	Pre-test X±SD	Post-test X±SD
Doing your work in your usual way?	3.70±.95	1.60±.89
Doing your usual work because of arm, shoulder or hand pain?	3.60±1.17	1.60±.89
Doing your work as well as you would like?	3.90±.74	1.60±.89
Spending your usual amount of time doing your work?	3.50±1.18	1.40±.55
Playing your instrument or sport in your usual way?	3.67±2.31	
Playing your musical instrument or sport because of arm, shoulder or hand pain?	3.67±2.31	
Playing your instrument or sport as well as you would like?	3.67±2.31	
Spending your usual amount of time practising or playing your instrument or sport?	3.67±2.31	

The above table represents the participants' ability to work or play sports and whether their arm, shoulder or hand injury has impacted on their ability to work or play sports. Participants were asked the questions on the left of the table and were expected to mark their answer from 1-5, 1= no difficulty, 2= mild difficulty, 3= moderate difficulty, 4= severe difficulty and 5= unable. The average item mean value for section 6 work section was pre-questionnaire 3.65 (SD= 0.80) and the post-questionnaire 1.24 (SD= 0.64). The participants who participated in the post-questionnaire all did not play musical instruments or sport. 'Doing your work in your usual way?' scored in the pre-questionnaire (M= 3.70; SD= .94) and in the post-questionnaire (M= 1.60; SD= .89). This result indicates that the average participant felt less difficulty in doing their work in their usual way in the post-questionnaire results. 'Doing your work as well as you would like?' scored in the pre-questionnaire (M= 3.90; SD= .737) and in the post-questionnaire (M= 1.60; SD= .89) which indicates that the participants felt less difficulty in doing their work as well as they would like in the post-questionnaire results.

4.4.1 CORRELATIONS OF THE DASH

In this section of the results, the correlations that were found to be significant of the DASH are discussed.

Table 21: Correlations between personal factors and DASH's items

Correlation	*Spearman's rho*	*p-value*
Highest level of education and Feelings of being less capable, less confident, or less useful because of arm, shoulder or hand problem	-.399	.048
Gender and Ability to write	-.511	.009
Highest level of education and Pain in the arm, shoulder, or hand	.449	.024

Age and Pain in the arm, shoulder, or hand	.522	.007

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations were computed among two DASH scales on data for 25 participants. The correlation between the participants' highest level of education and their feelings of being less capable, less confident, or less useful because of their arm, shoulder or hand problem was found to have a moderate negative correlation and to be statistically significant (r_s = -.40, n= 25, p< .05). The moderate negative correlation implies that the two variables being tested are moving in different directions. This implies that an increase in the participants' highest level of education is associated with a decrease in the participants' feelings of being less capable, less confident or less useful because of their arm, shoulder or hand problem. The strong negative correlation between the participants' gender and their ability to write implies that the two variables being tested are moving in different directions. This indicates that there is an association between gender and the participants' ability to write. The findings also suggest that an increase in the participants' highest level of education is associated with an increase in the participants' pain in their arm, shoulder, or hand. The strong positive correlation between the participants' age and the pain in their arm, shoulder or hand implies that the two variables being tested are moving in the same direction. This infers that an increase in the participants' age is associated with an increase in the participants' pain in their arm, shoulder, or hand.

4.5 RESULTS FROM THE JROM

The participants' joint range of motion in their upper limbs were measured using a goniometer before the intervention and again after the intervention. Of the 25 participants that were recruited for the study, only 11 participants completed the study. The following pie graph presents the assessment data from after the intervention stating if any improvement was noted or no improvement was noted.

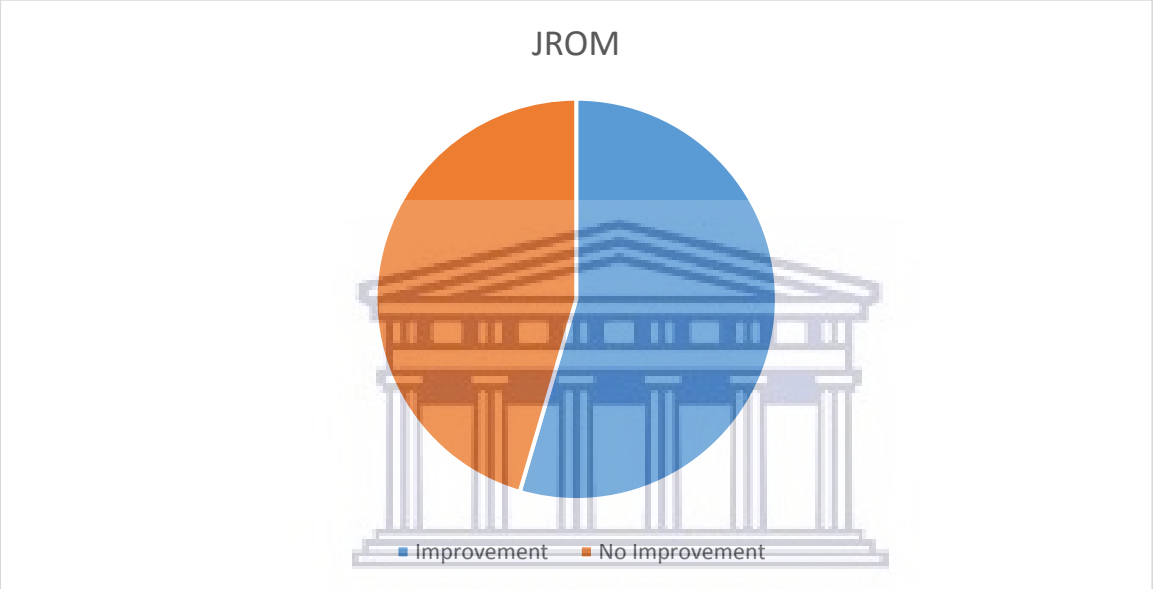


Figure 7: Represents the joint range of motion results after the intervention, indicating whether improvement was noted or no improvement was noted

According to the results of the JROM after the participants received the occupational therapy intervention, the results indicated that improvement in JROM after occupational therapy intervention is slightly more common than no improvement in JROM after the occupational therapy intervention.

4.6 PARTICIPANTS' EXPERIENCES RELATED TO ENGAGEMENT IN OCCUPATIONS

4.6.1 INTRODUCTION

In this section, four themes related to the participants' experiences of engaging in occupations after hand injuries have been identified. The themes that emerged include (1) "What happened to my hand?" (2) "Used to do everything including cleaning, washing clothes, everything." (3) I cannot do anything with my hands (4) "Maybe… Maybe you can help me to do everything I can do before." which reports the results of the patients' feelings of engaging in their occupations. These themes and their categories as well as subcategories are presented in Table 22 below in the next page of the thesis.

Table 22: Themes and categories emerged in the study

Themes	Categories	Subcategories
"What happened to my hand?"	• Possible reasons for hand injuries	• Assaulted • Work injuries • Motor vehicle accidents • Falling • Fighting
"Used to do everything including cleaning, washing clothes, everything."	• Activity engagement before hand injury	• Gardening • Physical training • Motor mechanics • Caring for loved ones • Home management chores • Leisure activities
I cannot do anything with my hands	• Activities after hand injury • Influences of hand injuries have on quality of life • Levels of interdependency after hand injury • How are things at home now	• Inability to do activities • Psychosocial aspects • Functional aspects • Financial stress • Work stress

		• Dependency on caregivers • Home situations
"Maybe… Maybe you can help me to do everything I can do before."	• Perceptions and feelings towards occupational therapy before and after intervention • Leisure activities participants enjoy engaging in at home after the intervention • Levels of engagement in ADLs after intervention	• Having hope that occupational therapy will improve function of the upper limb • Improved independence

4.7 THEME ONE: "WHAT HAPPENED TO MY HAND?"

The first theme deals with the events that led the participants to sustain the hand injuries. Therefore, this theme consists of one category: (1) Possible reasons for hand injuries, which are related to assaulted and hijacked, work injuries, motor vehicle accidents, sports injuries, falling and fighting.

Themes	Categories	Subcategories
"What happened to my hand?"	• Possible reasons for hand injuries	• Assaulted • Work injuries • Motor vehicle accidents • Falling • Fighting

4.7.1 POSSIBLE REASONS FOR HAND INJURIES

This category describes the possible reasons that resulted in hand injuries among the participants. It is clear from the participants' experiences that community members assaulted many of them. Two of the participants shared that they were accused of stealing in their communities, which resulted in the community members taking matters into their own hands. The participants also mentioned that they sustained

hand injuries because of being robbed. Also, some of the hand injuries that the participants experienced were results of being stabbed on the upper limbs.

> *"I was tied by a rope when I was accused of stealing."* (Participant 1)
>
> *"… They just tried to hold me sisi."* (Participant 11)
>
> *"Yes man… there were guys who were trying to rob me then when I try to move back, I fell down and then they hit me with something like a pump. And after that, my finger was bent to the back a little bit."* (Participant 12)
>
> *"I was stabbed. I was stabbed seven times. Left and right hand. And the back, and the ribs two times, and the thigh both sides thigh."* (Participant 16)

Apart from being assaulted, two of the participants shared that their hand injuries were a result of being hijacked in their cars. One participant mentioned that he sustained a brachial plexus injury as the hijackers shoved him out of the car, unaware that the safety belt was still attached to his body. The participant further reported that he hijackers drove off and dragged him with the car. Additionally, another participant shared that he used the hands as a shield for their head and self-protection when the hijackers were shooting, which led to the hand injuries.

> *"I was hijacked and then the driving off I got caught by the seatbelt, so I was dragged, and then I sustained a brachial plexus injury. 10 October last year 2018."* (Participant 6)
>
> *"It was a car hijacking. On the 1st of May and … obviously, they tried to take my car and … they started shooting so I tried to protect myself because they were trying to shoot myself on my head, so I tried to protect myself with my hands. So that is when I was injured on my hands. I got shot on my hands."* (Participant 24)

It was evident from the participants' discourse that some of the hand injuries that they sustained were related to the kinds of work that they engaged in, as part of their

income generation. Some of the participants shared that the types of work that they use to engage in included being a mechanic, putting up fences, and being a builder. This resonates with the title of the first theme, as the participants shared about their circumstances that led to their hand injuries.

> *"What happened to my hand? I was doing some mechanical work yabo* [You see] *in a car. So, what happened is that someone misunderstood to me and start the car. So that is when it hit me … just hold my whole hand. So I get affected. So, the two fingers were amputated because there was no nerve, they checked it, but it was going to be swollen, and then they amputated it."* (Participant 3)

> *"I was surrounding I was making the fence and then I cut my finger."* Participant 14

> *"I am working as a builder; I am self-employed so what happened to my little finger it was just a sore after that sore when I am looking at that sore and the little finger is also going to be flexed; as a result, it was so difficult for me to work. At the same time, now that it was just flexed like this, I used to hit it, to hit it, to hit it. As a result, I decided to go to the clinic, and I was referred to Bedford Orthopaedic Hospital. At Bedford Orthopaedic Hospital, the doctor said that they can try by all means to extend, but if they are unable to extend then they will decide to cut so I agreed upon that my little finger must be cut."* (Participant 21)

According to the participants, motor vehicle accidents were also part of the possible reasons that led to hand injuries.

> *"I was in a car accident. It happened on 10 January. It was now, just now. So, the car just rolled. That's how it happened."* (Participant 5)

> *"… on the 22 October I got attacked by a car accident. But I don't know what happened, but maybe it's a glass that cut my hand."* (Participant 8)

Concerning falling and breaking, participants shared that they fell, leading with their upper limbs, which resulted in hand injuries. For instance, the participant mentioned that they sustained their hand injury through falling while playing sport.

"I fell and I broke my hand." (Participant 13)

"The problem is I fall and the time I fall, I balance with my hands. Then I came to the hospital, and they put on cement because they saw me on the x-ray and then they put me cement. Then the next Sunday I wake up my hands are dead; they are not moving." (Participant 17)

"… I was playing soccer, and then I fell, and I injured my finger." (Participant 9)

Unplanned fights between the participants and their employees who were ill-disciplined also lead to hand injuries. For example, one participant mentioned that he sustained a hand injury while fighting and hitting a car with the affected hand.

"Yeah, it's a long story, but someone [Taxi Driver] *took my car and went to the bar with it and got drunk and then he didn't work that day, I am running a taxi business, so he didn't work. At the end of the day, he did not have money, it was round about 5 pm, I lost it, and I hit him so hard. I hit him, but I hit the car. It is painful here. Because I had an injury here, it is healing. Now I cannot fold my fist like this, you see. I showed the doc up there."* (Participant 10)

4.8 THEME TWO: "USED TO DO EVERYTHING"

The second theme contextualises the participants' experiences of engaging in instrumental activities of daily living namely cleaning and washing clothes. This theme emphasises the participants' abilities of activity engagement before they sustained their hand injuries. The category that emerged from this theme include (1) activity engagement before hand injury.

Themes	Categories	Subcategories
"Used to do everything"	• Activity engagement before hand injury	• Gardening • Physical training • Motor mechanics • Caring for loved ones • Home management chores • Leisure activities

4.8.1 ACTIVITY ENGAGEMENT BEFORE HAND INJURY

Within this category, the participants describe the things that they enjoyed doing at home before the hand injury occurred. These activities consisted of gardening, exercise, enjoy doing mechanical work, enjoy fixing the fence, watching movies, caring for a child, household chores, playing sports, video games, and enjoy being a builder. These are all the activities that the participants engaged in during their past times, which created a sense of enjoyment and fulfilment in their lives. Many of the participants mentioned that they enjoy doing gardening where they planted vegetables.

> *"I liked gardening."* (Participant 1)

> *"I like to work at home like chanting that is trying, by all means, to take wheat out also to move some blocks."* (Participant 19)

Some participants stated that they enjoy participating in a healthy lifestyle where they engaged in physical training. Some participants engaged in physical activity at the gym and others at home.

> *"When I wake up in the morning I start push-ups, exercise and jog."* (Participant 2)
>
> *"I go to gym. I lift weights. I cannot lift weights now. Yes, that is why I am like this now. I am weighing 126. I have a lot."* (Participant 10)

Two of the participants mentioned that they enjoy doing their work, as motor mechanics. Working on cars were these participants hobbies, which filled a lot of their time during the day. One participant also mentioned that they enjoyed doing their work that was related to building and plastering.

> *"I enjoy my work because I like mechanical work. I work on cars but now I am just sleeping because now it is hard for me now because I was using this left hand and now it is hard now. So now I can't do my things correct now yabo* [You see]*."* (Participant 3)
>
> *"Like my hobbies? I am a motor mechanic that's what I usually do all the time."* (Participant 5)
>
> *"Just have a job to be a builder, plastering and all those things."* (Participant 21)

Part of the roles of being a parent and partner, the participants indicated that they enjoyed some of their responsibilities of caring for their children and partners.

> *"Taking care of my baby. I play with my baby a lot. Bathing him, cooking."* (Participant 6)
>
> *"Yes. At home, I am just helping my wife because I stay at home with my wife and little son. I am helping because my hands it is not an everyday thing, it's just the*

pain sometimes and movement in the wrist. And then if I am holding something then I drop it." (Participant 17)

Instrumental activities of daily living were identified as part of the occupations that participants who had hand injuries tend to engage in while they were at home. Some of the occupations that the participants engaged in were related to home management chores such as cleaning, washing clothes, fixing the fence, cleaning the yard and washing cars.

"I cleaned at home." (Participant 7)

"I used to enjoy fixing the fence around the yard." (Participant 4)

"Ya, [Yes] *to clean the yard. To clean the yard and to help those women that I know how to handle the heavy things. So, I was helping, helpful at home and even at work but now I can't do."* (Participant 16)

"Wash clothes." (Participant 18)

"I like to wash my cars I like to clean the house. And obviously to keep the yard clean." (Participant 24)

There were leisure activities that the participants engaged in during their spare time, which included playing sport, playing TV games and watching movies and series were things they enjoyed doing during their past times.

"To play diski, to play soccer and boxing and play PlayStation. So now I can't." (Participant 8)

"I used to enjoy working and playing soccer. Now I cannot play soccer anymore because of the injury." (Participant 14)

"I like to watch movies." (Participant 5)

"I watch series for a lot." (Participant 6)

4.9 THEME THREE: I CANNOT DO ANYTHING WITH MY HANDS

The third theme deals with the struggles that influenced the participants' engagement in activities after they sustained hand injuries. This theme further highlights how hand injuries influenced the participants' lives and their levels of interdependency in their lives after they sustained their hand injuries. The third theme also highlights the influences of the hand injuries on the participants' lives and their roles. This theme is made up of the following categories (1) Activities after hand injuries (2) Influences of hand injuries on quality of life (3) Level of interdependency after hand injury (4) How things are at home now. Two of the participants' conversations support the title of the third theme, as they indicated that they could not do the occupations that they previously engaged in at home before their hand injuries.

> *"Wow, to stop my life, I can't do, you know, I don't know I don't know. But ke it is hard."* (Participant 8)

> *"Yoh it's a lot because I am unable to do the things I used to do at home."* (Participant 9)

Themes	Categories	Subcategories
I cannot do anything with my hands	• Activities after hand injuries • Influences of hand injuries on quality of life • Level interdependency after hand injury • How things are at home now	• Inability to do activities as physical exercise, caring for others, driving, lifting heavy objects, laundry, caring for self and cooking • Psychosocial aspects • Functional aspects • Financial stress • Work stress • Dependency on caregivers • Home situations

4.9.1 ACTIVITIES AFTER HAND INJURY

Within this category, the participants' description of the things that they enjoyed doing at home after the hand injury is displayed. The participants highlighted feelings of being unable to use their hands and feelings of not being able to do activities as well as they did before their hand injuries. Participants also mentioned that they had discovered newfound hobbies and some participants stated that they enjoy the same activities as before their hand injuries.

> *"There is nothing I can do because my hands are not working."* (Participant 1)
>
> *"I'm just doing nothing, nothing."* (Participant 11)
>
> *"Now that I am already injured, it's difficult to do anything now." (*Participant 17)

Many of the participants stated that they could not do activities as well as they did before their hand injuries occurred. These activities included physical exercise, caring for others, driving, lifting heavy objects, laundry, caring for self and cooking.

> *"I am not enjoying it. I can jog but not the others."* (Participant 2)
>
> *"I don't do training anymore because it's hard."* (Participant 18)
>
> *"I still, I am able to take care of my son. I can't really bath him. But I am still able to play with him."* (Participant 6)
>
> *"I still drive but it is difficult sometimes especially when I am driving a car without power steering. And then I like working up and down…"* (Participant 10)
>
> *"I can't lift heavy things."* (Participant 14)
>
> *"No, just that I am continuing with my job but it's not like the same as it used to be before ya* [Yes]*. I still do my laundry but because I just put it in the washing machine."* (Participant 20)
>
> *"I cannot longer wash my clothes; I cannot even bring this cup to drink because it takes focus."* (Participant 13)

"At the moment I am trying to wash myself because for the past few weeks I couldn't wash myself. Ya [Yes] *so I can't dry a towel ..."* (Participant 22)

"It is almost the same. There's only a few differences. I can't bath my son, I can't chop vegetables, but otherwise it's not much of a difference." (Participant 7)

Many of the participants found new hobbies after their hand injuries that they spend their time and enjoy doing. The participants did not previously engage in these activities, which involve activities such as reading books and engaging in social media.

"I like reading books." (Participant 4)

"I love social media more now. Ya [Yes]*, I don't know why."* (Participant 6)

Some of the participants mentioned that they are still enjoying the same activities as they did before their hand injuries occurred. These activities included watching TV, household chores and gardening.

"I enjoy watching TV still." (Participant 6)

"Yes I still wash clothes but it's painful. If I take something that's heavy, it's painful. Worst when weather is like this. It's painful even if I hold umbrella." (Participant 16)

"Everything really. I still try to do planting. A lot of work my wife's doing." (Participant 23)

4.9.2 INFLUENCES OF HAND INJURIES HAVE ON QUALITY OF LIFE

Within this category, the participants' responses regarding the influences of their hand injuries on their quality of life are displayed. Psychological aspects regarding the loss of function of a hand appeared in this category. The participants mentioned that they used to participate in certain activities; however, their hand injuries seemed to have influenced their quality of life. These activities were meaningful to the participants and brought a sense of quality of life. This affected the participants' functional aspects, as they were unable to engage in meaningful occupations and activities. Participants

highlighted that their hand injuries had was commonly associated with feelings of having financial and work stress.

One of the significant influences that the participants' hand injuries had on their quality of life was evident in their psychological aspects, which includes the stages of loss. The participants reported that they previously had good hand function before they sustained hand injuries. However, after hand injuries the participants experienced a sense of loss, as their function in their hands were decreased. This sense of loss made the participants lose hope in life. The feelings of loss also lead to participants having an inability to participate in meaningful occupations resulting in a sense of boredom, which results in indulging in activities such as watching TV and sleeping. Another psychological aspect that the hand injuries had on the participants is the feeling of sadness due to the inability to use their hands. The hand injuries also influence the participants' self-image as they have noticed that people stare at their hand.

> *"It has impacted me a lot because I have lost a lot."* (Participant 14)
>
> *"Yaa* [Yes]*… eish. I feel… it makes me lost hope like I'm never going to use my hand again you know."* (Participant 15)
>
> *"Will it ever be, okay? The doctors told me; they have been telling me I even went to Frere hospital as well they told me that there's no doctor that can fix joints. So, I have lost hope."* (Participant 19)
>
> *"I do it good because I do nothing, just sit all day and do nothing watch tv. I am not doing anything ever since I got this injury."* (Participant 10)
>
> *"The main concerns that you, the main concerns. Now, I can't do these things you know, so I like to sleep the whole day because I can't due to this hand."* (Participant 8)
>
> *"Now, to watch laptop, sleep. Yes, because I don't know how to uh. I sleep."* (Participant 8)

"Er what worries me the most… er losing the power of my hand ya [Yes] *that's the thing because why being like paralysed firstly is not something so or maybe something you would wish for so that's the most hurting part for me."* (Participant 21)

*"Sometimes it's painful. When people are getting, people stare a lot." (*Participant 6)

Many of the participants conveyed associated feelings of not being able to do certain functional activities and tasks when they were asked how their hand injury has influenced their lives. These activities were identified as important to the participants as it was meaningful for them to participate in these functional aspects of their lives. Being unable to participate in meaningful activities resulted in a decreased quality of life, as experienced by the participants. The inability to participate in doing household chores, caring for self, physical exercise, gross and fine motor activities emerged from the participants when they highlighted that their quality of life was affected.

"Yoh very bad. I can't do washing and using the toilet because of my hand because now I use my left hand." (Participant 2)

"Ya [Yes] *my main concerns is like I say it's obviously I can't cook and I like to cook in the house. I can't make food because obviously, I can't do anything now like making food you know, being busy with the stove and pots and everything. I can't do that anymore."* (Participant 23)

"Ya [Yes] *it impacted a lot because not even to many things, to wash myself, dishes so it's very difficult."* (Participant 12)

"Yoh, it has made a lot of changes. For instance, I can't train anymore. Ya [Yes] *and it's limiting me in everything, and I don't often use this hand."* (Participant 20)

"And ya [Yes] *things now, I can't do the things it's very difficult for me to lift heavy things."* (Participant 23)

"No, I stress more because it is not holding, and once I hold the things like plastic when I go to the shop. Once I hold the plastic, I just drop. I can hold my bag like this, but I don't know what's happening if I am getting tired." (Participant 16)

"One of the most important things that has gotten hectic by my injury is that I can't even go to school because I can't hold a pen." (Participant 4)

"There's just the few things that I can't work like I can't work things that need to be tied up. And things that need to be zipped from the back like if the zipper is all the way down. Uhm, what else, uhm. It is difficult to put on my shoes sometimes when it's shoelaces on. Uhm, what else, uhm. Ya, those are the only things that I can think of now." (Participant 6)

Many of the participants highlighted financial stress when they were asked how their hand injury has influenced their lives. The participants felt stressed about their finances, as their children were starting tertiary education and they needed money to pay for the tuition fees at the tertiary institutions. Additionally, the participants indicated that they needed money for living, which means that they needed to pay for rates and electricity.

"It impacted me a lot because also my children were starting tertiary now. The money to support them, it is difficult for me… so there's a lot, and I am staying with my mother who is a pensioner. so also… there are those things rates ntoni [What] *it's affecting me because we are staying in town, so rates and electricity cost a lot of money, we struggle a lot because my sister is not working just sewing… so she get such small jobs when someone wants her to sew for him some jackets. She is a tailor I can say."* (Participant 3)

"Ayyy, it's heavy because I don't get any money. I am suffering." (Participant 25)

"It worries me because I can't do anything, and I am worried that I won't be able to work for my kids again." (Participant 1)

The main concern that some participants had were feelings of being worried regarding not being able to work again. As a result, this adds on to the participants having financial related stress, as they needed to work to earn money and live. Work also appeared to bring a sense of identity and role involvement within the participants' home life.

"I want my arm better, because I am a hard worker and I can't do work, I can't do work." (Participant 2)

"The problem is that I used to get money, I used to work for myself, but now I am unable due to this injury. I was helping someone who was fixing electricity." (Participant 9)

"Ya [Yes] *even if I can… I can't just to work as usual. I can't work as usual, and my children like to question me so many times "what happened to this? What happened to this?" they are always having questions."* (Participant 15)

*"My wife left me after seeing that I won't be able to work again." (*Participant 2)

"Things are as bad as even I was the breadwinner; my child is unable to even get the things that he used to get before." (Participant 20)

4.9.3 LEVELS OF INTERDEPENDENCY AFTER HAND INJURY

The levels of interdependency after hand injuries have been identified by the participants, as one of the challenges that needed them to rely on others for assistance with many basic activities of daily living. Therefore, this category captures the participants' conversations about their lives after they sustained their hand injuries. The components that surfaced in this category were that the participants felt dependent on their caregivers to assist with participation in daily occupations. The participants shared that they depend on their family members to help them with cooking, laundry, garden work, feeding, dressing, and washing of the dishes.

"I feel like I am dependent on people now because even the person that I am staying with, I cannot even help me, and I have to ask people to come and help me and she's old she's 98 years old." (Participant 1)

"No, some of my family supported me. When I am alone at the house, because I can't cook and do washing and work in the garden." (Participant 2)

"No, that's how I feel. I feel dependent because I can't do anything. I can't even feed myself." (Participant 4)

"No. Because I am already injured. My daily living is also affected. I am unable to wash the dishes. I am unable to wash my clothes, unable to do some chores even at home." (Participant 9)

"It has really changed my life because now I am so stressed because I am dependent on people. Even when I am sleeping, I think a lot then I get pains in my chest." (Participant 1)

Many of the participants mentioned that after their hand injury, they tried to participate in their activities of daily living. Some of the participants use their unaffected hand to do their activities of daily living, and other participants persevered even though it was hard.

"Haai, I try as much as I can. I use the functional hand to support the other hand." (Participant 2)

"I am supporting myself but it's hard ntoni it's hard to even to wash now hey yoh because also this finger hey it's painful ntoni but I try my best." (Participant 3)

4.9.4 HOW THINGS ARE AT HOME NOW

Within this category, the participants reflected on their home situation. The participants were asked how things were at home now; however, they responded that their home environments were becoming worse, as activity and participation has stopped, and community members are not visiting. Some of the participants shared that there were no piece jobs in the community; as a result, they found it hard to care for others.

"Everything is becoming worse at home because my mum is also worried about me and she is becoming more sick ever since I was injured." (Participant 1)

"Okay, now that I am staying alone, a lot of things have just stopped. Because no one is helping me because I am alone at home." (Participant 10)

"Okay to be honest things are not well because I am not sure whether other people in the community are not coming to me because they know that I just have this little finger because there is a little bit scarce of jobs now." (Participant 22)

"They are not the same obviously because I have two kids. I am always playing around with them, carry them but because of now I can't carry them." (Participant 24)

4.10 THEME FOUR: "MAYBE YOU CAN HELP ME TO DO EVERYTHING I USED TO DO BEFORE."

Theme four deals with the participants' perceptions of whether the occupational therapy intervention has helped them. Furthermore, this theme explores whether the participants were able to engage in their activities of daily living after the occupational therapy intervention has taken place. The title of the theme emerges from the conversation with participant 18, who appeared to show some volition towards occupational therapy. This fourth theme consists of three categories, namely (1) perceptions and feelings towards occupational therapy before and after the intervention (2) leisure activities participants enjoy engaging in at home after the intervention and (3) levels of engagement in ADLs after the intervention.

Themes	Categories	Subcategories
"Maybe you can help me to do everything I used to do before"	• Perceptions and feelings towards occupational therapy before and after intervention • Leisure activities participants enjoy engaging in at home after the intervention • Levels of engagement in ADLs after intervention	• Having hope that occupational therapy will improve function of the upper limb • Improved independence

4.10.1 PERCEPTIONS AND FEELINGS TOWARDS OCCUPATIONAL THERAPY BEFORE AND AFTER INTERVENTION

Before attending the occupational therapy intervention, the participants were asked whether they think that attending occupational therapy will help them after they have sustained a hand injury. The participants stated that they have hope that occupational therapy will help them to improve function in their upper limbs. The participants responded by saying that they think that occupational therapy would help them, as their treating doctors have referred the participants to occupational therapy. Many of the participants stated that they feel, as if occupational therapy will help them, as occupational therapist studied to work in their profession.

> *"I think, and I have hope that it's going to help."* (Participant 4)
>
> *"Yes, I have hope that you will help me now that I am attending occupational therapy. I think my hand will become back to the normal one."* (Participant 9)
>
> *"Ya. I think, I have hope because I trust the doctors. Because you went to school for this thing, and I know you can help me."* (Participant 15)
>
> *"Ya. I think so. Because I know you studied this thing, so you are doing it, the thing that you know."* (Participant 11)
>
> *"Yes, as I am already promised by the doctor, and I also believe that I would be okay by attending occupational therapy. Ngalokho andiyaz* [With that, I do not know]*. I am not sure."* (Participant 19)

After attending the occupational therapy intervention, the participants were asked whether they thought that attending occupational therapy has helped them with their hand injuries. Many of the participants stated that there are certain activities that they can participate in after attending occupational therapy. Additionally, some of the participants mentioned that they could take care of themselves after attending occupational therapy, which indicated that their independence was restored.

"Yes. I see attending occupational therapy will benefit me because now I can even be able to hold a spoon. Something that I couldn't do before I came here. Yes, there is, there is… it is not the same like before. According to the injury before attending OT, it was so difficult for me to move my hand, but now at least there are some things that I am able to do." (Participant 1)

"Yes. It helped me because before… there was a lot of things I wasn't doing you see, but now ahhh I do a few things like wash myself and doing dishes and everything you see." (Participant 12)

"Yes. Because the time when I was discharged from hospital, I couldn't use my hand, I couldn't move. But since I have started attending here, I can see the difference." (Participant 13)

4.10.2 LEISURE ACTIVITIES THAT PARTICIPANTS ENJOY ENGAGING IN AT HOME AFTER THE INTERVENTION

Within this category, the leisure activities that the participants participated in at home after the intervention are discussed. Participants were asked to describe the things that they enjoy doing at home after they have attended the occupational therapy intervention. Some of the participants mentioned that they are still struggling whereas other participants noted that it is becoming better now, and they were in the process of returning to their past activities.

"Up to now, I am still struggling because as I said that I used to deal with the gardening, still even now. I am still struggling even to hold the wool, so most of the time I am still struggling." (Participant 1)

"Today ya, it's not easy to do, I like to do gardening sometimes, but it's not easy, but I try to do it now." (Participant 12)

One of the participants mentioned that they could clean the yard and do small mechanical work again after attending the occupational therapy intervention. One

participant went back to joining the gym whereas another participant continued playing video games.

> *"At least it's better now because at least I can clean my yard. I do small mechanical work now."* (Participant 3)
>
> *"They came back. They changed."* (Participant 17)
>
> *"Nothing much. Except gym. Yes, I've started."* (Participant 10)

4.10.3 LEVELS OF ENGAGEMENT IN ADL'S AFTER INTERVENTION

Within this category, the participants' levels of engagement in ADLs after the intervention are discussed. The participants were asked how well they look after themselves after attending the occupational therapy intervention. Many of the participants responded by saying that they were taking care of themselves quite well, as they were trying to do everything by themselves to break the tendency of interdependence.

> *"I know that I am taking care for myself by trying, by all means, to be around the house and I am also trying by all means to keep myself a little bit clean as I know that I am not allowed to go far… As a result, you can imagine… I don't want to even go to the sport because I do know that even if it is cold, I have to go to my bed."* (Participant 1)
>
> *"Ya* [Yes] *at least yabona* [You see]*, it's good. Ya at least I do everything by myself."* (Participant 3)
>
> *"I'm taking care of myself."* (Participant 10)
>
> *"I think I am taking care of myself because if I feel like this job is going to be too much for me, I try by all means to take the job bit by bit. So that I know that there is this little finger that is not around yes."* (Participant 15)
>
> *"No. I am all right now. I do everything for myself, yes. It's better now than before."* (Participant 17)

4.3 SUMMARY

In this chapter, the results were presented based on the socio-demographic characteristics of the participants. Furthermore, the results from the MHQ, DASH and JROM were covered. The qualitative data were described using five themes. Theme 1 consisted of the events that took place, resulting in the participants sustaining a hand injury. Theme 2 consisted of the participants' activity engagement before they sustained their hand injuries. Theme 3 consisted of (1) activities after hand injuries, (2) influences of hand injuries have on quality of life, (3) levels of interdependency after hand injury, and (4) how things are at home now. Theme 4 consisted of three categories, namely (1) perceptions and feelings towards occupational therapy before and after intervention, (2) leisure activities participants enjoy engaging in at home after the intervention, and (3) levels of engagement in ADLs after intervention.

CHAPTER FIVE

DISCUSSION

5 INTRODUCTION

The current study examined the effects of OBHT in hand functioning among clients with hand injuries within occupational therapy practice in a South African context. Chapter five involves the discussion of the findings covered in chapter four of the study. Additionally, this chapter is structured based on the objectives of the study, which are discussed and interpreted through the findings, literature and interactions among the components of the ICF as presented in Figure 8. The ICF guided the understanding of the participants' health condition based on the four components known as body functions, structures, activities, and participation (Marks, Herren, Vlieland, Simmen, Angst & Goldhahn, 2011). Additionally, the contextual factors related to personal and environmental factors provide a scientific base for understanding the health, outcomes, and related determinants (Marks et al., 2011).

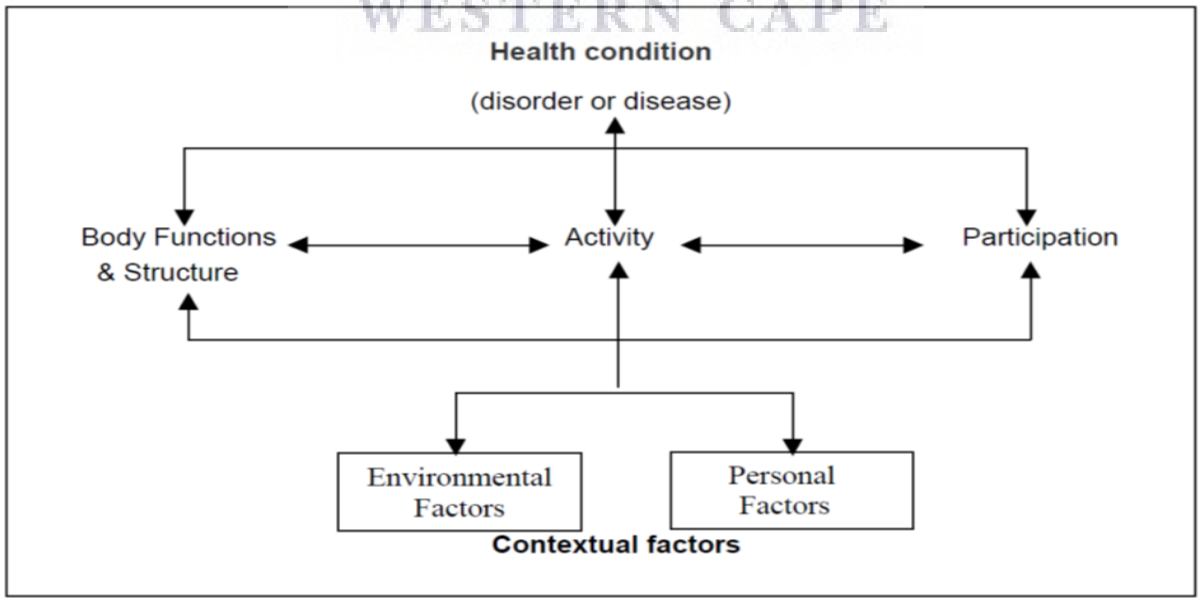
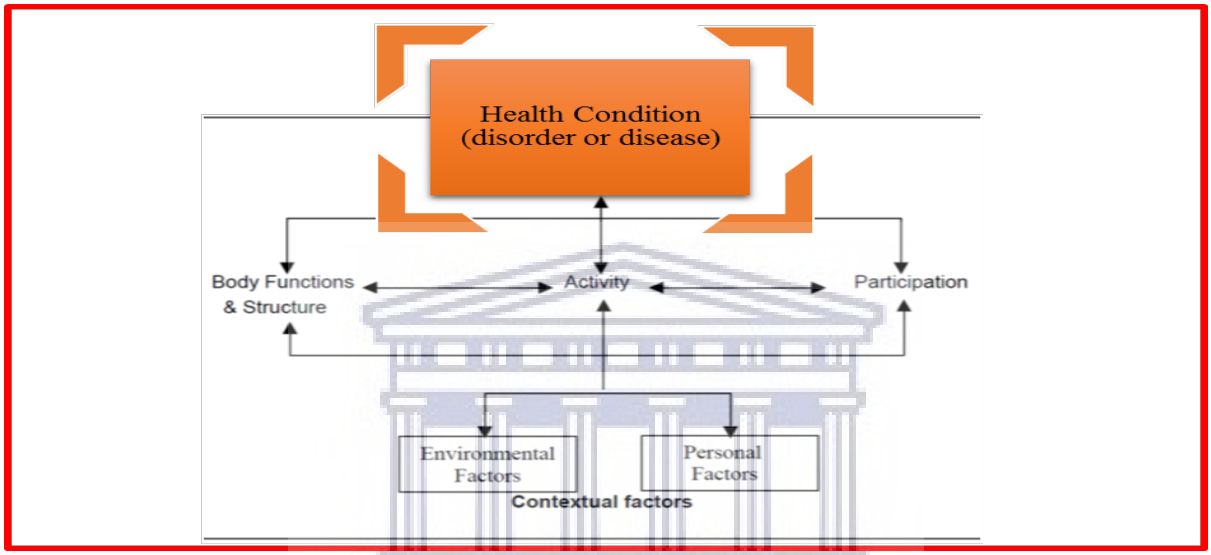


Figure 8: ICF Components

5.1 TO DESCRIBE THE PARTICIPANTS' SOCIO-DEMOGRAPHIC CHARACTERISTICS

The above objective is discussed based on the components of ICF (i.e., health condition and contextual factors), and the findings emerged in Chapter four.

5.1.1 HEALTH CONDITION (DISORDER OR DISEASE) AS A COMPONENT OF ICF



Health condition is one of the vital components of ICF that deals with the influence of the disease on functioning. From the findings of the current study in Theme One, it was clear that the hand injuries manifested as health conditions that resulted in activity limitations and participation restrictions. The findings supported Uys, Buchanan and van Niekerk's (2020) explanation that the socio-economic load of a hand injury in South Africa is significant, predominantly for manual labourers whose job tasks are physically challenging and involve hand function. Additionally, the findings highlighted that hand injuries influenced the participants' engagement and participation in OBHT. Therefore, the findings further provided evidence that the hand injuries related to

tendon injuries, fractures, assaults, and nerve injuries of their upper limbs tend to take place in communities where the participants live in and work. From the findings of the current study, it was evident that living in communities that are influenced by criminal activities such as robbery led to the high prevalence of hand injuries. Many of the hand injuries also occurred by being stabbed on the upper limbs.

These hand injuries included extensor tendon injuries. According to the found literature, two-thirds of all extensor tendon lacerations are associated with concomitant injury to bone, skin, or joint (Newport, 1997). A complete cut of the extensor tendon will inhibit full MCP extension. A partial extensor cut may be painful or may present with incomplete MCP extension (Newport, 1997).

From the findings of the current study, it was noted that the participants who were accused of stealing in their communities tend to be attacked by the community members taking matters into their own hands. The findings highlighted that the community members sought justice by tying these participants using a rope around their upper limbs and abdominal areas; thus, resulting in nerve injuries of their upper limbs. McAllister et al. (1996) state that when the median nerve is injured at the wrist level, it results in paralysis of the thenar muscles, inability to abduct and pronate the thumb and a sensible deficit of the radial three and a half digits. Grip and pinch strength are mostly weakened. The hand displays an externally rotated thumb into the plane of the palm and a wasted thenar prominence. The median nerve is located precisely volar of the superficial flexor tendons and close to the radial artery. Related flexor tendon and vascular injuries are common with median nerve injury (McAllister et al., 1996). Omer (1988) states that an ulnar nerve injury or traumatization is associated with significant sensory loss, profound weakness, and an awkward appearance of the

hand. Sensation is absent over the volar side of the little finger and ulnar half of the ring finger. In proximal lesions, there is also sensory damage in the dorso-ulnar side of the palm. Moreover, the consequence of ulnar nerve paralysis is a severe muscle imbalance ruining the delicate mechanical structure of the hand and severely affecting the grip function (Omer, 1988). Profound deficiencies occur in the 'intrinsic minus' hand with damage of the interossei, thenar, hypothenar, and adductor pollicis muscles. The appearance of the hand suggests the muscles involved in the injury. The look of the digits of the hand will be as follows, the fourth and fifth fingers are hyperextended at the metacarpophalangeal (MCP) joint but flexed at the distal phalangeal (DIP) joint. The thumb is abducted and the second and third fingers are extended with slight flexion of the DIP joint. Grounded on their close association with the nerve, associated injury to the ulnar artery and the flexor carpi ulnaris (FCU) tendon is frequent (Kozin et al., 1999). According to Kleinert and Verdan (1983), the radial nerve is also a joint sensory and motor nerve. The point of injury will specify whether patients are unable to extend the elbow joint, the wrist joint (dropping hand) and the fingers. This is also an incapacitating injury, as it results in a person not being able to flex the fingers adequately enough using their muscle strength to grip an object due to muscle imbalance. A sensory deficit is essentially found on the dorsum of the hand and fingers (Kleinert & Verdan, 1983).

People are assaulted in these communities due to poor living conditions, lack of work and poverty. According to Hamann and Tuinder (2012), 15% of the over, 20-year-olds in the province cannot read or write. Regardless of progress in the providing of housing and basic services by the government since 1994, the Eastern Cape still has some of the uppermost proportions of poverty and unemployment in the country. Seventy-two

percent of the Eastern Capes population was living below the poverty line, which was recorded in 2004 (Hamann & Tuinder, 2012). According to Hamann and Tuinder (2012), the rate of unemployment in the province by the middle of 2010 was 27.7%. According to STATS SA (2016), 1367 people are unemployed amongst a total working population of 4129 in the Eastern Cape Province.

South Africa has a high incidence of crime, occurring due to poverty, which results in disability (Møller, 2005). According to Møller (2005), South Africa has high crime rates by international standards, and one of the biggest challenges in the second decade of democracy in South Africa is fighting crime. This can be supported by the number of violence and injuries that tend to cause of premature deaths and disability (Coovadia et al., 2009), which appeared to be one of the causes that led the participants in the current study to sustain hand injuries.

It was noted in the findings of the present study that majority of the participants did not complete their education, which resulted low living standards. The findings are consistent the explanation that unemployment has been worsened by low educational completion, and a dysfunctional education structure that is an obstinate inheritance of apartheid (Coovadia et al., 2009). Furthermore, the findings of the current study corroborated with Wegner et al. (2008) who found that adolescent health and education in South Africa is significant worry because of school dropout, which is considered as leaving school before finishing a given grade in a given school year. Adolescents who dropped out of school had advanced degrees of cigarette and alcohol use compared with those still in school. Often enough, these leisure activities such as smoking and the use of alcohol results in conflict amongst these adolescents, which then leads to violence and sometimes physical and mental disabilities.

Furthermore, a part of being assaulted, it was noted from the findings that participants sustained hand injuries because they were hijacked in their cars resulting in brachial plexus injuries. According to Birch (2015), brachial plexus injury is one the most severe injuries that affect the peripheral nerves that transmits signals from the spinal cord to the upper limbs, which includes the shoulder, arm and hand. A brachial plexus injury occurs when these nerves are compressed, stretched or ripped apart from the spinal cord. Therefore, it was highlighted that a high number of patients can reach restoration of glenohumeral control, wrist extension and elbow flexion, thoracoscapular control, with normal sensation within the median area of the hand and the relief of pain only if surgeons address the habit of procrastination (Birch, 2015).

The findings of the present study indicated that many of the participants sustained hand injuries at work while engaging in activities related to mechanic, putting up fences, and building, which resulted in removal of all, or part of an arm or leg known as amputations. However, previous studies reported the rationales of amputation as a surgical procedure performed to treat disease, injury, remove tumours from bones and muscles or infection (Kim & Kim, 2012) as well as to reduced blood flow (Miyajima et al., 2006). Additionally, amputation is one the procedures that may need to be performed when people sustained injuries, such as severe burn or accident, or cancer in a limb (Pooja & Sangeeta, 2013). In contrast to the rationales, the findings of the current indicated that the participants had traumatic amputations due to their activities.

It was noted from the findings that a health condition such as arthritis led some of the participants to lose their function in their hands. Anderson and Loeser's (2010) explanation echo the finding that osteoarthritis (OA) is a common disorder, which is age-related that affects the joint range of motion and can cause deformity. OA is

commonly referred to as a chronic degenerative disease and considered by many to be an unavoidable result of growing old. Loss of the articular cartilage and degradation is a central feature of OA. OA is on occasion attributed to “wear and tear”. OA is the most frequent joint disorder in the world and one of the most frequent foundations of pain and disability in the elderly. The hand is the appendicular joint most frequently affected by OA in the ageing population (Anderson & Loeser, 2010). Sellam and Berenbaum (2013) discuss in their paper that obesity, together with ageing and injury is amid the main risk factors for OA. Recent trends in literature state that OA is a disease that can be characterized based on the risk factors involved and the pathophysiological means fundamental to the joint damage which are considered as ageing, obesity, genetic factors, or injury (Sellam & Berenbaum, 2013).

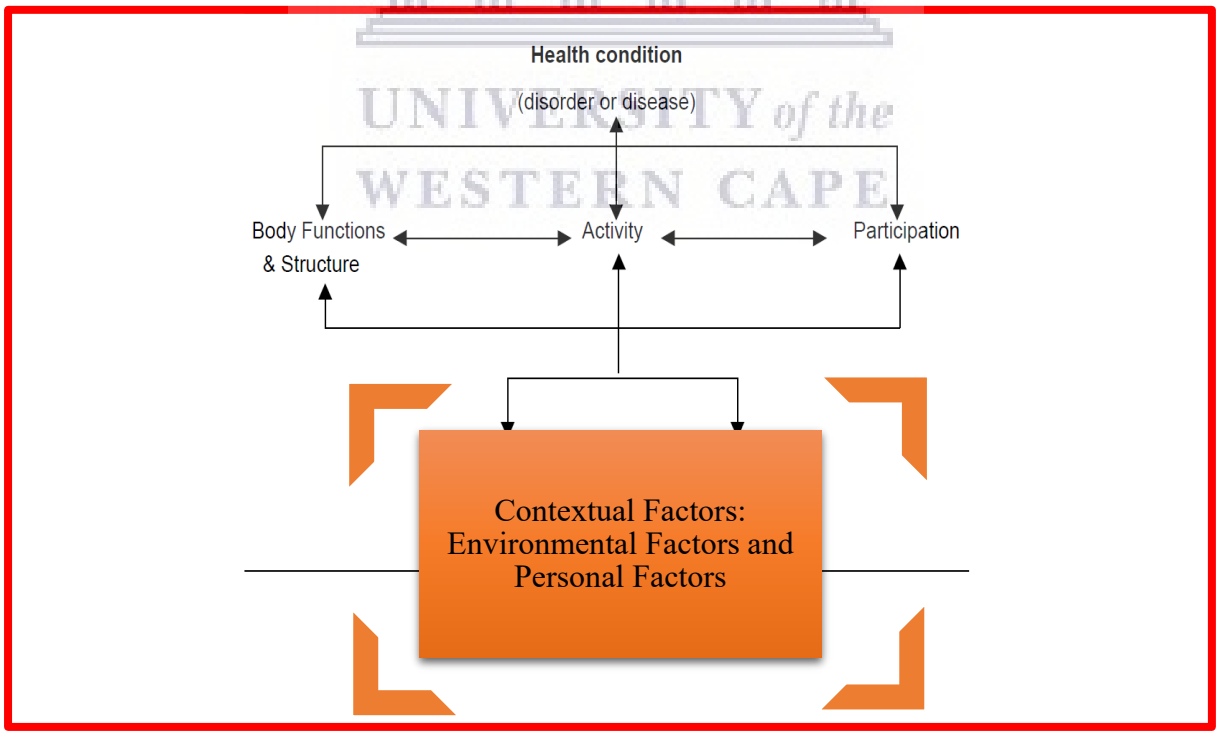
Another health condition that appeared to influence the hand functioning among the participants who were recruited for the purpose of the study was carpal tunnel syndrome (CTS). This finding indicated that the participants’ median nerve was entrapped within the flexor retinaculum of the affected hand as explained by Hall et al. (2013). Hence, the findings of the current support that the participants with CTS presented with paraesthesia in the thumb, index, middle, and radial half of the ring finger, which appeared to influence participation in satisfying occupations. This finding is providing evidence that are supported by Hall et al. (2013) who found that other signs and symptoms of CTS are inclusive because they result in occupational disruption in sleeping patterns, pain, loss of functional grips, and reduced finger dexterity.

The findings highlighted that hand injuries were results of falling and fractures of the upper limbs that led into joint dislocations. Moreover, it was noted from the findings

that the participants were involved in motor vehicle accidents and used their upper limbs as a safeguard tool, which resulted in them sustaining hand injuries. These findings are consistent with Carter et al. (2000) who confirmed that upper limbs are used as a defensive force whereby the forearm and hand are often extended to take in the effect of the trauma, with a slim preference for the dominant hand. However, Wilson (1976) and Court-Brown et al. (2001) support that the fractures are results of more force or pressure than the upper limbs can support, which commonly occur secondary to car accidents, *falls*, or *sports injuries*, as noted in some of the participants in the current study.

5.1.2 CONTEXTUAL FACTORS

Environmental factors and Personal factors



In the ICF, external environmental factors include products and technology, natural environments, social relationships, attitudes and services, systems and policies (Ferguson, Jelsma, Versfeld & Smits-Engelsman, 2014). Personal factors include internal factors related to the individual such as gender, age and coping style, social background and education (Ferguson et al., 2014). The quantitative data, as well as Themes Three and Four support this component of ICF. One of the objectives of the current study was to describe the participants' socio-demographic characteristics. In this section of the present study, the socio-demographic characteristics of the participants are discussed. From the quantitative data findings in chapter four, the participants' ages ranged between 20 and 60, with the majority being between the ages of 20 and 40. It was found in the results section of the study that older age is associated with a decrease in feelings towards being uncomfortable in public regarding the appearance of their right hand. Rumsey and Harcourt (2004) found that middle and later adulthood could bring constancy to self-esteem and body image, consequential from reduced dependence on physical appearance and on the opinions of others. Hand appearance is meaningful to patients because hands are an essential part of human communication, social integration, and interactions (Johnson, Sebastin, Rehim & Chung, 2015).

The findings of the present study suggest that increasing age is associated with a decrease in the participants' feelings towards the interference of regular social activities regarding the appearance of their right hand. Rumsey and Harcourt (2004) state that social complications may continue into adulthood and establishing relationships can be distinguished as problematic for people who are uncomfortable about their appearance. In contrary, Peat, Peyerl, Ferraro and Butler (2011) found that there are substantial differences in body dissatisfaction between younger and older

men such that younger men reported greater dissatisfaction in their body satisfaction. Clarke and Griffin (2008) state that ageing is inevitable, and it is the onset of chronic and physical conditions, many older adults advocate and support the need for acceptance. Johnson et al. (2015) state that a patient's opinion of their hand appearance may be unfavourably influenced by social perceptions. Brose, Scheibe and Schmiedek (2013) state that developed emotion regulation skills with age are a noticeable enlightenment for the finding that older adults show relatively high levels of well-being in comparison with younger adults. Social roles frequently differ between younger and older adults, and this forms the structure of daily lives. Younger adults typically establish intimate relationships; engage in succeeding at work, a family, and a social network.

In contrast, family-related responsibilities are usually reduced in older adulthood, and social ties are generally well-established (Brose et al., 2013). Hamlet and Harcourt (2015) found that people living with any kind of visible difference (disfigurement) may assign superior value to features of their lives, such as family and careers, instead of focusing on appearance, and this may facilitate a sense of satisfaction and fulfilment. The psychosocial influence of a physical condition may decrease over time, as the individual has time to incorporate and adjust the state into their self-image, resulting in heightened self-esteem. It is frequently presumed that physical appearance is less significant to older adults, leading to lower levels of appearance worries and concerns compared with younger adults. Hamlet and Harcourt (2015), also states that with age, people's attention moves from appearance to physical and functional health matters. On the other hand, society as a whole may have lower expectations of older adults'

appearances, which leads to the external pressures to keep an ideal image to therefore reduced (Hamlet & Harcourt, 2015).

Within the findings of the study, it was found that an increase in the level of education is associated with a decreased level of satisfaction with the motion of their fingers in their right hand. This result implies that a higher level of education often means that people work in a more skilled work. Brose et al. (2013) mentioned that younger adults naturally participate in succeeding at work. Therefore, an increase in level of education is associated with a decreased level of satisfaction with the motion of their fingers in their right hand as a reduced range of motion in fingers affects work.

The findings highlighted that 83.3% of the participants were male, and 16.7% of the participants were female. The finding provides evidence that hand injuries were more common amongst males, which is supported by the work of Grivna, Eid and Abu-Zidan (2016) who found that hand injuries account 7%-28% among young men seen arriving at hospital emergency departments. Interestingly, the findings of the study indicate that there is an association between gender and the participants' ability to write. Lee and Al Otaiba (2015), states that socioeconomic status and gender are vital demographic variables that strongly relate to academic achievement. The authors found that both boys and girls from high-poverty households achieved considerably lower than the girls from low-poverty households in phonological awareness, alphabet knowledge, and spelling. Gender gaps were found, with a female advantage, between children from high-poverty households in spelling and alphabet knowledge and between children from low-poverty households in alphabet knowledge. This could indicate that many of the male participants could not write before their hand injuries, as males were more frequent in the study. Although, hand injuries are more common

in males than in females and this could therefore be the reason why there is a link between gender and the ability to write. More males were assessed in this study because males are more affected by hand injuries hence the association between gender and the ability to write. The single most striking observation to emerge from the data comparison was that there is an association with gender and the participants' feelings towards depression regarding the appearance of their right hand. Williams, Newman, Ozer, Juarros, Morgan and Smith (2009) found that depression had a harmful consequence on general health status after a hand injury. Johnson et al. (2015) found that aesthetic worry is a significant concern for patients with hand OA and is related with anxiety, depression, and low health-related quality of life. Paradiso and Robinson (1998) found that among men depression was linked more commonly with a physical disability. Depressed males also tend to perceive their social support as less satisfactory compared with non-depressed men. Social impairment and activities of daily living predicted severity of depression in males (Paradiso & Robinson, 1998). Dalgard, Dowrick, Lehtinen, Vazquez-Barquero, Casey, Wilkinson, Ayuso-Mateos, Page and Dunn (2006) state that although artefactual factors may improve a female dominance in depressive disorders to some extent, the gender difference in depression is genuine. Marks et al. (2011) state that in hand surgery and therapy, it is not found to be proven that gender affects patient satisfaction. Clarke and Griffin (2008) state that the process of redefining a person's self-concept as an outcome of chronic illness includes the negotiation of identity trade-off as individuals change their future goals, confront their physical losses, and surrender control. Therefore, this struggle is gendered as women and men are faced with diverse "identity dilemmas" that stem from existing cultural norms relating to masculinity and

femininity (Clarke & Griffin, 2008). Van Loey and Van Son (2003) states that women are more vulnerable to the outcomes of a deformity or disfigurement. Still most epidemiological studies on depression support the finding that women are twice as susceptible to depression as men. Van Loey and Van Son (2003) further elaborate by saying that female gender is linked with the development of depression and post-traumatic stress disorder, especially when a visible disfigurement exists.

The more surprising correlation is with the association with gender and the participants' feelings towards the interference of regular social activities regarding the appearance of their right hand. According to Hannah (2011), a hand injury has psychological, physical, and social consequences. Independence in meaningful activities and early participation certifies that vital roles are conserved, which positively affects motivation, *locus of control,* self-esteem, identity, and *outlook*. The hands are an essential part of what describes us as human beings. Hands facilitate independence in leisure, self-care, work, and social interactions. More than any other part of the body, hands are figurative in communication and are instruments of expression. One's hands are used in prayer, intimacy, greetings, and aggression; they are also an essential part of one's body image. People with severe hand injuries encounter extreme emotions (fear, sadness, anger, anxiety, guilt, etc.) directly after their injury, during succeeding surgical and therapy treatments, and through their continuing evaluation of its impact on their life. Numerous social variations take place subsequently to a hand injury. These social adaptations comprise of reintegrating an altered body image, dealing with dependence and heightened emotions, reassessing life goals, dealing with role failures and modifications, and coping with the *social stigma*.

People may start to avoid activities and events with their social group, causing social isolation (Hannah, 2011). However, Rumsey and Harcourt (2004) stated that findings linking to gender effects on the body image involving people with visible differences are mixed. The author says that many writers have assumed that females experience more considerable psychological disturbance, as the consequence of greater weight placed on female appearance by society. Also, men have been found to be less probable to use a cover-up on their disfigurement (Rumsey & Harcourt, 2004). A study by Brown, Roberts, Browne, Byrne, Love and Streiner (1988) encompassing 260 burn-affected individuals hinted at the density of variables involved in adjustment, and the role of gender. Additional recreational activities, more generous social support, less avoidant coping, low functional disability, and further problem solving accounted for 55% of the adjustments. In men, the most influential predictor of adjustment was less functional disability, as opposed to women, it was the use of problem-solving coping.

The results of the present study also suggest that an increase in the level of education is associated with a decreased level of satisfaction with the appearance of their right hand. This result implies that people with a higher educational level often work in more professions that are skilled. Therefore, their level of satisfaction with the appearance of their right hand is decreased, as they need their hands to work. This finding is consistent with Hannah (2011) who reported that hands deliver people to be independent and engage in work, leisure, self-care, and social interactions. Therefore, Green and Henseke (2014) supported the conception that a graduate job involves high-level skills that are typically developed in the course of higher education. However, Cederlund, Thorén-Jönsson and Dahlin (2010) cautioned that the consequences of a severe hand injury might lead to impaired physical function, which

decrease occupational performance and participation in daily occupations. Cederlund et al.'s (2010) explanation aligns with the findings of the present study that highlighted that many participants happened to experience high levels of stress and frustration of not being able to do everything that they want to do due to their hand injury.

Majority of people living in Mthatha are African and using public health services. From the findings, it was clear that 63.9% of the participants were single, and 36.1% of the participants were married. These findings indicated that the majority of the participants were single, which appeared to a challenge when they need to engage in activities of daily living. However, the findings in the current study also indicated that some of the participants lost their relationships because their partners could not cope with the fact that they had to provide help.

From the findings of the present study, it was noted that an increase in marital status is associated with an increase satisfaction level with the motion of their fingers in their right hand. These findings aligned with Schier and Chan (2007) who shared that a significant part of the person's identity is their role as a spouse or significant other. In addition, the findings revealed that there were participants who shared that their hand injuries deprived them some opportunities to engage in purposeful occupations such self-care and homemaking tasks, which led to some of these tasks to be executed by their spouse or significant others as once shared by Schier and Chan (2007). Marriage is a unique relationship because of its period, intensity, and requirement of the dyad on each other, and because the partners are probable to depend most on each other in times of crisis and need, including illness. Women might have added trouble with psychosocial role changes that might come from incapacitating conditions (Schier & Chan, 2007). Crewe and Krause (1992) suggested that individuals in post-injury

marriages were a select group and that the understanding and experience of marriage additionally supported their satisfaction with life and with their adjustment.

The study indicates that an increase in the participants' marital status is associated with an increase in the participants' age. For instance, Wolfinger (2015), states that for the longest time it appeared that the longer an individual waited to marry, the better the outcomes of marriage. The reason for this is that the relationship between age at marriage and divorce risk was almost linear; thus, the older you were, the lower the chances of divorce. Most young couples merely do not have the coping skills, maturity, and social support it takes to make marriage work (Wolfinger, 2015).

The finding of the present study suggests that an increase in the participants' highest level of education is associated with a decrease in the participants' marital status. Chambers and Kravitz (2011) opposes this result by stating that the rate of marriage increases significantly as the level of education increases. Paul (2019) did a study in India, examining the effects of education and poverty on the prevalence of girl child marriage in India. The result of the research supports the findings of the current study by stating that girls with no schooling and primary level of education are having an increased likelihood of getting married at an early age.

Nonetheless, the probability of girl child marriage starts declining with secondary level of education. Additionally, higher secondary and a higher level of education suggestively decreases the occurrence of girl child marriage (Paul, 2019). Since the majority of the participants were young adults, there is a link between marital status and age, as well as marital status and gender. It was obtained that an increase in the participants' highest level of education is associated with a decrease in the

participants' feelings of being less capable, less confident, or less useful because of their arm, shoulder or hand problem. Baker, Batstone and Kisely (1998) state that education and support build confidence.

The study revealed that the majority of participants who participated in the study were right-hand dominant. According to Heuer (2007), most people have a strong preference for using the right hand in one-handed tasks; a minority prefers the left hand.

From the findings, it was evident that the issue of unemployment before their hand injuries was a challenge that affected the participants (8.3%). Hamann and Tuinder (2012) who reported that the Eastern Cape has some of the uppermost amounts of poverty and unemployment in the country support the findings in the present study. However, it should be noted that the unemployment rate is increasing because some of the participants (52.8%) sustained hand injuries and they could not return to work after they their hand injuries. This could mean that clients who sustained hand injuries should be treated earlier to save their hands.

On the other hand, it was noted that majority of the participants in the study had a low level of education, as they did not complete high school, which appeared to contribute to the unemployment in the context where the participants live. Unemployment has been worsened by low educational completion, and a dysfunctional education system is an obstinate inheritance of apartheid (Coovadia et al., 2009). According to Spaull (2013), as far as educational results, South Africa has the most impoverished education system of all middle-income countries that partake in cross-national assessments of academic achievement. Reduced superiority schooling at the primary and secondary level in South Africa harshly limit the youth's ability to exploit and

achieve further training prospects. As a result, current skills shortages among those who are the product of a failing school system (predominantly black youth) are likely to continue (Spaull, 2013). Majority of the participants came from low earning household incomes. This is due to the high unemployment rate and low educational completion as previously mentioned. An increase in approximate family income is associated with an increase in the participants' highest level of education. Kinsler and Pavan (2011) support this finding by stating that family income considerably affects the quality of higher education.

The most striking result to emerge from the data is that the participants felt less depressed at the end of the occupational therapy intervention when they were asked whether the appearance of their right hand made them feel depressed. The study indicated that the average participant in the study felt as if the interference of the appearance of their left hand regarding social activities has improved at the end of the occupational therapy intervention. However, Hannah (2011) states that several people experience social shame linked with traumatic hand injuries. Cosmetic distresses have been found to have a noticeable consequence on long-term social acceptability and can delay with overall adjustment. The visibility of the hand tends to influence how others view and perceive their hands, when they are in the mist of other people.

During hand therapy and rehabilitation, it is vital to identify functional goals that are meaningful and important to the person and to assist people in becoming independent in self-care as soon as possible. This independence will confidently affect self-esteem and restore life roles of people who sustained hand injuries. Enabling and facilitating participation and engagement in meaningful activities, through activity modification, adaptive equipment, and compensatory approaches warrant those essential roles are

preserved. Impairment goals, such as range of motion and strength should be incorporated with activities that are valued and important to the patient, consequently improving motivation and therapy engagement (Hannah, 2011). Marks et al. (2011) state that greater depression was associated with less satisfaction with treatment and higher levels of disability. Psychosocial features, such as depression, coping, and anxiety, influence many shared patient results, such as levels of pain, patient satisfaction, and disability. Marks et al. (2011) established that a very significant expectancy of patients after MCP joint replacement was to increase the appearance of their hand. Deformity, which mildly links with satisfaction, might also be linked with aesthetics (Marks et al., 2011).

The results of the current study also suggest that the participants felt more satisfied with the appearance of their right hand after they have received the occupational therapy intervention. Marks et al. (2011) did a study on the causes of patient satisfaction after orthopaedic interventions to the hand. The outcomes indicate that patient satisfaction is governed by numerous factors. There is reasonable evidence that activities of daily living/function, aesthetics, pain/symptoms, and embodiment influence patient satisfaction. Marks et al. (2011) support the studies finding by stating that it was found that a significant expectation of patients after MCP joint replacement was to improve the appearance of their hand.

Among the plausible explanations for these findings is that the average participant felt as if their upper limb improved at the end of the intervention regarding the interference with regular social activities. Schier and Chan (2007) did a study on changes in life roles after a hand injury, and the results showed that the participants conveyed insightful degrees of difference in their ability to perform adequately in their various life

roles after receiving hand therapy. All three participants in their study professed therapy as advantageous and beneficial to them, expressed hope, and goal direction for further improvement in function (Schier & Chan, 2007). Marks et al. (2011) found that symptom improvement increased satisfaction in patients presenting with a physical symptom.

The finding of the present study suggest that the average participant felt more capable, confident, and useful regarding their arm, shoulder or hand problem at the end of the intervention received. Verma, Vora, Thatte and Yardi (2019) did a study on patient perception after traumatic brachial plexus injury. The results found that on a repeat evaluation at five months of continuing rehabilitation, the patient displayed a slight improvement of M3 grade in supraspinatus, infraspinatus, and biceps muscles clinically. The patient, being an educated adult, valued these slight improvements, and this resulted in enhanced motivation, confidence, and positive attitude toward rehabilitation.

The present findings also suggest that the participants displayed frustrations, feeling stressed and dependent on other people as they felt like they are unable to complete meaningful activities and tasks, which was identified in Theme Three. Morris, Daluiski and Dy (2016) state in their study that the psychological and emotional impact of brachial plexus injury was apparent in many participants' responses. Participants discussed their struggles with depression, anxiety, fear for the future, posttraumatic stress disorder, substance use, issues with self-esteem, and relating to others outside the brachial plexus injury community. Lai (2004) supports this result by stating that early responses toward hand injuries included being upset, angry, unhappy, resentful, and pessimistic. Lai (2004) also stated that patients' longing to conquer dependency

on others was found to be a solid foundation of motivation for recovery. Failure to complete the desired activities leads to frustration and discouragement. Bear-Lehman (1983) states that ‘‘Injury deprives individuals of independent performance of self-care and homemaking tasks,’’ so a numerous amount of these tasks may have to be performed by the patient’s spouse or significant other. Cederlund et al. (2010) states that dependence may be a stressful factor for patients with hand disorders.

In Theme Three, it was found that financial related stressors were highlighted by many of the participants when they were asked how their hand injury has impacted on their lives. Participants felt stress about their finances as their children were starting tertiary education, and they needed money to pay for the fees of the tertiary institution. Participants need money to live, which means that they need to pay for rates and electricity. Schier and Chan (2007) state that if hand injuries stop people from occupational engagement, then they can be a notable cause of stress and disturbance in our daily lives. Such injuries may affect depression, anxiety, fear for the future, goals in life, and sense of well-being in the family because the human hand is so involved in independence and caregiving (Schier & Chan, 2007). Hannah (2011) states that financial stresses may entail that the role of ‘‘breadwinner’’ is assumed by another family member such as a spouse.

A point that was highlighted in Theme Three, when the participants were asked how their hand injury influenced on their lives, was that of work stress. The reasons the participants indicated feelings of stress regarding work, is that they felt an inability to do their job thoroughly, or in the same way they did before their hand injury. The anxiety of not being able to work has impacted on the participants’ home life; one participant’s partner has left them, another participant depends on their mothers'

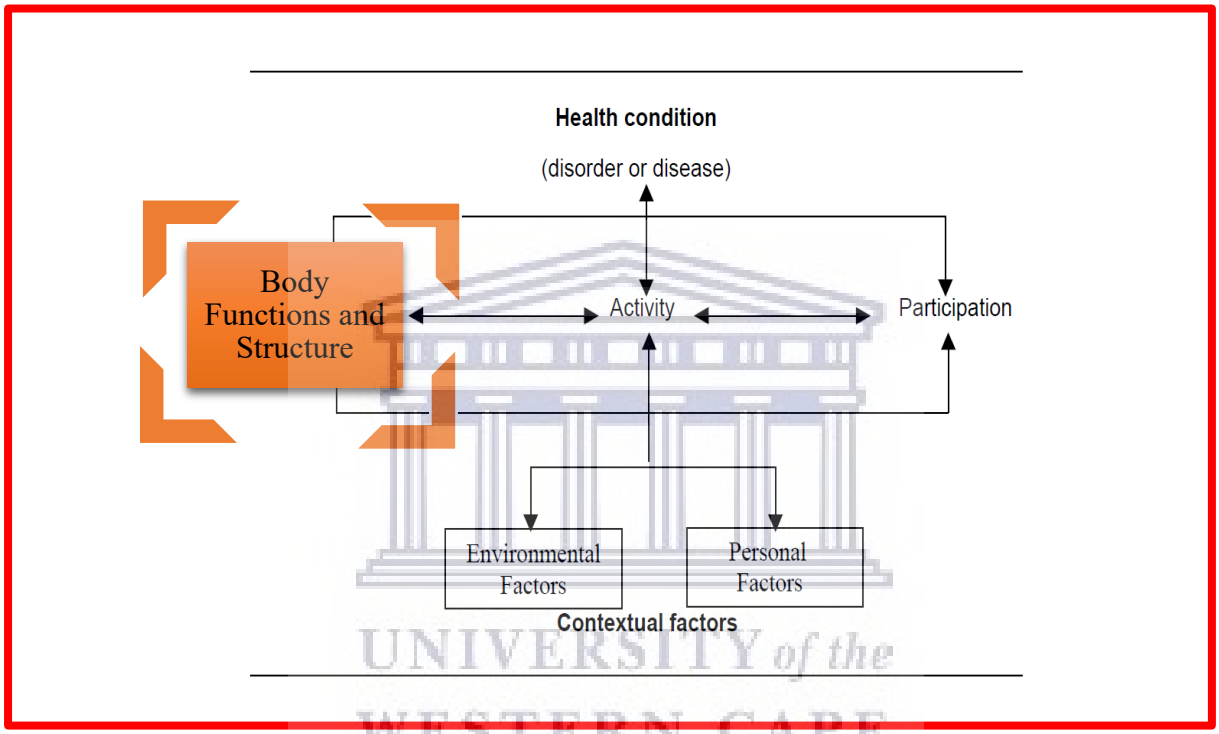
pension, with a different participant worrying about not being able to provide for their child. Two participants mentioned that the main concerns they have about their hand injuries were the pain they felt and this impacts on their lives. Schier and Chan (2007) states that an added principal role in the patient's identity is that of a worker, in which a person's association with the greater society is recognised. A hand injury may endanger income, affect the family's social status, and more subtle characteristics of the role of the worker in society. The job held by the head of a household frequently concludes the family's social and economic status, so if that individual is not capable in performing specific tasks of their occupation as a worker, changes in career, income, and social circles may be the outcome (Schier & Chan, 2007).

Regarding the participants' future, some participants envisioned themselves returning to work (moving forward in their careers and furthering education) in their future, which was found in Theme Four. The participants mentioned that they have hope that their hands would work again. Other participants were feeling uncertain about the future due to their hand injuries, and a few participants felt no change, as they believed that their hands would not work again. Lai (2004) states that the motivation for recovery may not have a straight influence on the injury, but it does have an impact on how the patients respond to their injuries, which might then influence their outlooks and consequently their lifestyles, i.e., lifestyle influences rehabilitation process. Patients' motivation for recovery in hand rehabilitation is predisposed by numerous motivational concepts such as attitude toward disability, goal setting, hope and optimism toward the future, and perceived social support at work. Snyder (2000) stated that positive and hopeful-thinking people display more adaptive and positive emotional response to barriers, and this type of thinking is particularly helpful in the face of impairment.

5.2 TO ASSESS WHETHER OBHT HAS EFFECTS ON HAND FUNCTIONING (MOTOR SKILLS) AMONG CLIENTS WITH HAND INJURIES

The above objective is discussed based on the components of ICF (i.e., body functions and structure, and activity), and the findings emerged in Chapter Four.

5.2.1 BODY FUNCTIONS AND STRUCTURE



The ICF organises the body functions into eight key areas, of which five are particularly relevant to the exploration of hand injuries. These include i) mental functions, ii) sensory function, iii) neuromusculoskeletal and movement-related functions. The body's functions and structures are demarcated as the physiological purposes of the body structure, containing psychological functions and anatomical structures of the body such as organs, limbs and their components (WHO, 2001). The quantitative data supports this component of ICF. Another objective of the current study was to assess whether OBHT has effects on motor skills among clients with hand injuries. In this section of the study, the effects on motor skills that the OBHT had will be discussed.

According to the quantitative findings of the study in chapter four, the participants mostly felt like sensation in their right hands were not considered as a problem to them. Woo, Bakri and Moran (2015), states that injuries to the ulnar nerve affects both the motor and sensory shortfalls within the hand. Outcomes of ulnar nerve repair can be increased with both hand therapy and sensory re-education. Sensory re-education methods have been extensively used in adults after nerve repair, and such treatment has been suggestively positively correlated with a return to work.

The findings highlight that the participants felt like there was an improvement in the way their right and left hands worked after they have received the occupational therapy intervention. Valdes and Marik (2010) state that hand therapy interventions for patients with *hand osteoarthritis* (OA) may contain paraffin, exercises, the utilisation of adaptive devices, splinting, joint protection technique instruction, and provision of a home exercise program. Findings for the use of joint protection techniques are advocated for enhancements in function and pain reduction. Valdes and Marik (2010) supports the practice of application of heat, hand exercises, orthotics, and joint protection education together with providing adaptive equipment to improve function and grip strength. Case-Smith (2003) states that in clients with upper limb injuries or surgery, occupational therapy interventions emphasise on empowering the client to regain functional usage of the traumatised arm and hand or both and return to their previous occupations. Case-Smith (2003) found that clients with diminished hand function, who do not have secondary impediments, such as, burns, central nervous system disorders, or severe peripheral nerve injuries, make considerable progress in a 6 to 8-week occupational therapy intervention for hand rehabilitation.

The findings of the study revealed that participants believed the strength in their right and left hands had improved after the intervention. Brorsson, Hilliges, Sollerman and Nilsdotter (2009) found a substantial enhancement in hand function and hand force in patients with rheumatoid arthritis was seen after six weeks of hand rehabilitation; the enhancement was even more distinct after twelve weeks of hand rehabilitation. Hand exercise is, therefore, a successful intervention for rheumatoid arthritis patients, resulting in improved strength and function (Brorsson et al., 2009). Studies have shown that daily hand exercise is successful in improving grip strength (Brighton, Lubbe & van der Merwe, 1993; Hoenig, Groff, Pratt, Goldberg & Franck, 1993). Daud et al. (2016) stated that involvement and participation in daily occupations and day to day activities aids in restoring function in individuals with injured hands and offers a program to practise selected meaningful occupations. The incorporation of OBI into hand injury rehabilitation enhanced and improved results for clients (Daud et al., 2016). Dorf, Blue, Smith and Koman (2010) states that hand therapy is vital in various features of treatment, and patients with upper limb injuries may spend significantly more time with a therapist than with a surgeon. Hand therapists manage strengthening, pain management, minimization of joint contractures, oedema control, maximisation of tendon gliding, and work hardening, counselling, and ongoing diagnostic evaluation (Dorf et al., 2010). Daud et al. (2016) state that OBHT can be offered as a distinct therapy and can improve both occupational performance and function of injured hands.

This study indicates that the participants believed the pain in their right and left hand subsided during their daily activities after receiving the occupational therapy intervention. Cederlund et al. (2010) states that following a hand injury the patients may experience difficulties to perform daily occupations, decreased hand function, and

reduced health-related quality of life. Cederlund et al. (2010) found that most satisfaction in daily occupations, physical aspects of hand function, and health improved a year after reconstruction and repair between all participants with a severe or significant hand injury, while mental health improved slightly, and cold sensitivity did not improve at all. Księżopolska-Orłowska, Sadura-Sieklucka, Kasprzak, Gaszewska, Rodkiewicz-Bogusławska and Sokołowska (2016) state that rehabilitation reduces oedema and exudate in joints, alleviates pain, improves hand function by increasing the range of motion, restoring familiar mobility stereotypes, strengthening muscles, and producing standard compensation.

The findings suggest that participants believed that the severity of stiffness in their arm, shoulder or hand improved after the intervention. Wong (2002) states that joint stiffness, following from a range of difficulties after hand injuries, remains a frequent problem. Persistent swelling, scar formation and shortening of soft tissue after an extended time of immobilisation are the leading causes, which results in the loss of joint range of motion. The intervention utilised to advance the joint stiffness should be problem-focused and integrative. Pressure therapy, active and passive mobilisation through meaningful activities and remedial splinting should be started as soon as problems occur (Wong, 2002). Sibtain, Khan, and Shakil-ur-Rehman (2013) state that a stiff hand is found to be a frequent condition, which results in pain and disability, the paraffin wax bath, and joint mobilisations have a crucial role in stiff hands rehabilitation.

It was found that the average participant felt more satisfied with the overall function of their left hand. Case-Smith (2003) states that clients with upper limb injury or surgery made effective, positive improvements in functional measures after client-centred

occupational therapy rehabilitation. Usually, hand rehabilitation includes widespread interventions for (1) physiological deficiencies, (2) activity complications, and (3) restrictions in roles or occupations. Zagzoog, Chinchalkar, and Sumsion (2008) state that the occupational therapist's objective is to increase hand function through different treatment modalities to enable re-engagement in 'safe' and meaningful occupations. Although the aim of the occupational therapist is always to safeguard the client's satisfaction with any given therapy grounded on the client's functional outcomes. Clients who had progressed through a period in therapy would have an extraordinarily worthy functional outcome, and therefore experience an increased level of satisfaction with the treatment they obtained. These therapies included thermoregulation, range of motion exercises, *fluidotherapy*, joint mobilisation, massage, desensitization, electrical nerve stimulation, ultrasound, splinting and/or continuous passive motion, in union with accurate education and pain control (Zagzoog et al., 2008). Roh, Lee, Park, Noh, Gong and Baek (2016) states that patient understanding, and knowledge of their injury, its treatment, and health care practitioner's instructions plays an essential role in *health management* and recovery from trauma. Roh et al. (2016) found that limited health knowledge was related to reduce adherence in orthosis management for mallet finger injuries and resulted in weaker treatment outcomes in terms of extensor lag and treatment satisfaction.

The results of the present study also suggest that the participants felt improvement in the motion of the fingers in their left hands after they have received the occupational therapy intervention. Wang, Erlandsson, Jun Rui and Hong Xu (2011) state that the capability to make a full fist and grasp objects is an essential motion for many everyday activities of living. Heiser, O'Brien and Schwartz (2013), state that *joint mobilisations* are used as a treatment plan for decreasing pain, improving range of

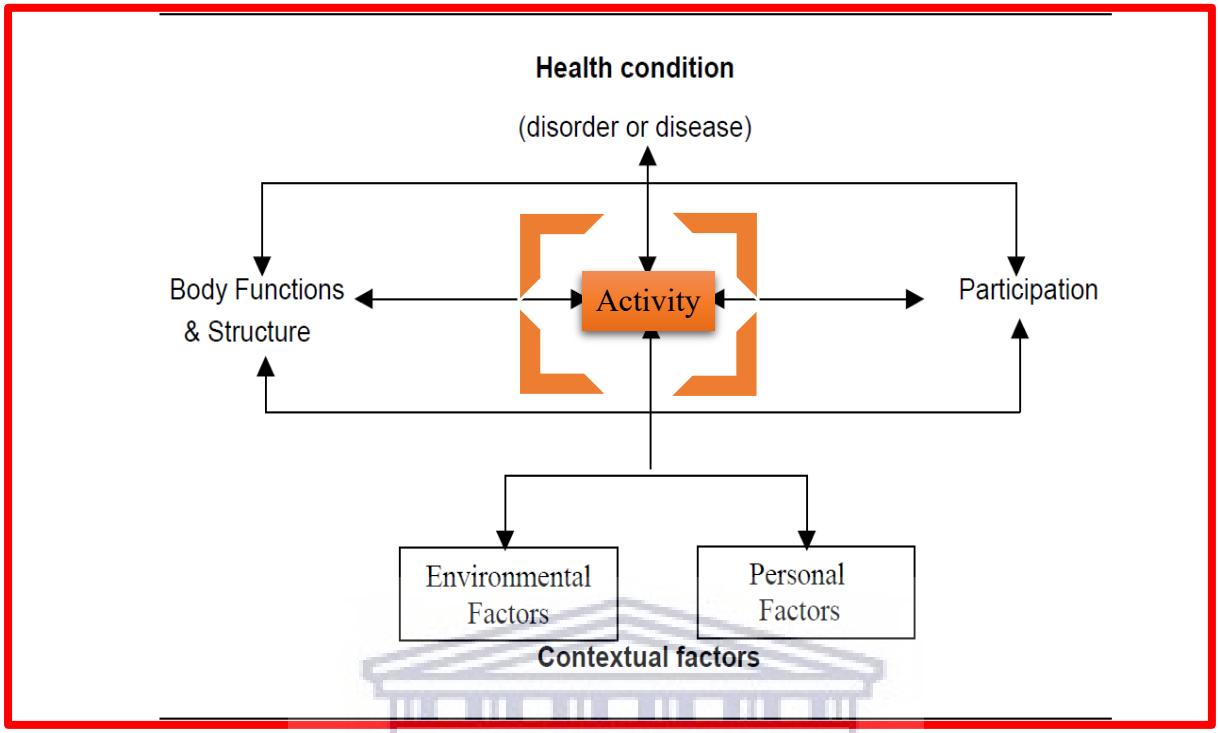
motion, and ultimately improving function in patients with an extensive range of upper limb diagnoses. Teunis, Thornton, Guitton, Vranceanu and Ring (2016) state that stretching exercises are beneficial even when painful and thus results in immediate improvements in motion. Chen, Hu, Weng, Huang, Chiang, Chen, Tsuang, Yang, Sun and Cheng (2014), state that therapeutic exercises and mobilisation are effectively suggested for decreasing pain and improving ROM and function.

Interestingly, it was found that an increase in the participants' highest level of education was associated with an increase in the participants' pain in their arm, shoulder, or hand. Dorner, Muckenhuber, Stronegger, Ràsky, Gustorff and Freidl (2011), state that pain is a crucial problem for society and a significant challenge for public health. The authors found that socio-economic status, based on income, education, and profession was inversely and progressively related with the occurrence of severe pain, with the number of indicated painful body sites, the strength and intensity of pain, and with the personal level of feeling disabled due to the pain. Dorner et al. (2011) oppose the current study's finding by stating that people with lower socio-economic status progressively reported increased disability through pain. Rodrigues-de-Souza, Palacios-Cena, Moro-Gutierrez, Camargo, Salvini and Alburquerque-Sendin (2016), state that socio-economic and educational influences are also observed as modulators of pain. The expression of pain is intricately related to those factors that structure the individual´s social environment, such as social network, knowledge, and socio-economic factors. Rodrigues-de-Souza et al. (2016) also opposes the current study's finding by stating that having increased education decreases the awareness of pain because higher educated people will have increased knowledge about how to find clarifications and understanding of the mechanisms of

pain. Education might aid patients to become cognisant of their pathology, and this may assist their treatment adherence. Education also tends to lead people to implement healthier lifestyles that will prevent risk factors for pain (Rodrigues-de-Souza et al., 2016).

The findings highlighted a correlation that an increase in the participants' age was associated with an increase in the participants' pain in their arm, shoulder or hand. Hitzig, Campbell, McGillivray, Boschen and Craven (2010) support this finding by stating that shoulder pain/stiffness is related to age. Alm, Saraste and Norrbrink (2008), did a study where they found that the risk of shoulder pain and musculoskeletal disorders seems to intensify as a person with a spinal cord injury age. Woodrow, Friedman, Siegelaub and Collen (1972), found that with increasing age, acceptance to cutaneous pain increases and acceptance to deep pain decreases.

5.2.2 ACTIVITY



In ICF, activities are tasks or actions executed by the individual, and participation relates to involvement in a life situation (WHO, 2001). Theme Two, three and four support this component of ICF. The research question to the current study was: Does occupation-based hand therapy improve hand functioning in areas of occupation among clients with hand injuries? In this section of the study, the answer to the research question will be discussed. The health condition that affected the participants' activity level was their hand injuries. The participants' ages ranged between 20 and 60, with the majority being between the ages of 20 and 40. This means that the participants were from the working age-group, having families and establishing their lives. Hence, activity participation is vital for the participants of the study because of their age group. As indicated in Theme Two, before the participants' hand injuries they participated in activities which consisted of gardening, exercise, doing mechanical work, fixing the fence, watching movies, caring for children, household chores, playing

sports, video games, and building. These are all the activities that the participants engaged in during their pastimes, which created a sense of enjoyment and fulfilment in their lives. However, after the participants injured their hands, their participation in activities changed, which was indicated in Theme Three. Many of the participants stated that they could not do activities as well as they did before their hand injuries occurred and at most times, not at all. This limited the participants' enjoyment and fulfilment in their lives as their occupational engagement was affected. Schier and Chan (2007) support this finding, as the authors' state that if hand injuries inhibit us from occupational engagement, then this can be a substantial cause of stress and disruption in our daily lives. The participants struggled with their work, caring for their children, driving, lifting heavy things, doing household chores and gym, which is consistent with the findings of Schier and Chan (2007). As a result, of these struggles, some participants found new hobbies after their hand injuries that they enjoyed doing. Some of the participants mentioned that they are still enjoying the same activities as they did before their hand injuries occurred. Schier and Chan (2007) state that hand injuries might disturb one's goals in life, effect fight for financial security, and reduce the sense of well-being in the family since the human hand is contributory and involved in independence and caregiving. The authors also mentioned that a person's role as a caregiver to young children is one with the probable to be significantly impacted by a hand injury. The patient might not feel that they can sufficiently carry out the accountabilities of parenting children (Schier & Chan, 2007). An additional crucial role in the patient's identity is that of a worker, in which a person's association to the larger society is recognised. A hand injury may endanger income and affect the family's social status (Schier & Chan, 2007).

Most of the participants in the study were males, as previously mentioned that hand injuries affect males more. Males are raised to be the breadwinners in their families and to look after their families; therefore, hand injuries often result in males not being able to work and provide for their families, which causes disruption and stress within their daily lives. Thus, the participants mentioned that they felt stressed, depressed, and not satisfied after they sustained their hand injuries. As a result, the average participant felt more capable, confident, and useful regarding their arm, shoulder or hand problem at the end of the intervention received because they felt that improvement was noted. Sathiparsad, Taylor and Dlamini (2008) state that in South Africa, the patriarchal system exists. This is based on the decisive role of the father as the head of the household, which influences family life and is an important risk factor behind intimate partner violence and family breakdown (Sathiparsad et al., 2008). The health condition being the hand injury and the personal factor being that most of the participants were male, influenced the participation in the activity of work as males needed to work to be the breadwinners but their hand injury inhibited this. The participants were from an age group where they were having their own families and their hand injuries influenced their ability to participate in the activities of caring for their children.

Nonetheless, as indicated in Theme Four, after the participants attended the occupational therapy intervention, their participation in activities changed again. Some participants mentioned that they are still struggling with activities whereas other participants mentioned that their participation improved, or that they were in the process of returning to their past activities. One of the participants mentioned that they could clean the yard and do small mechanical work again after attending the

occupational therapy intervention. Another participant went back to join the gym whereas one participant continued to play video games. Doble and Santha (2008) state that the results of occupational therapy emphasise fundamentally on improving and increasing the quality of clients' occupational performance. Occupational well-being is improved when persons' occupational requirements, together with their requirements for accomplishment, affirmation, agency, coherence, companionship, pleasure, and renewal are constantly met. Occupational therapists can play an important role in facilitating clients to create or re-orchestrate their occupational lives, so they are competent to meet their occupational needs more constantly (Doble & Santha, 2008). Hannah (2011) states that timely involvement and independence in meaningful activities certifies that significant roles are conserved, which optimistically impacts self-esteem, identity, motivation, *locus of control*, and *outlook*. Cederlund et al. (2010) found that most physical features of hand function, fulfilment in daily occupations, and health enhanced a year after repair and reconstruction among all participants with a severe or major hand injury, while mental health developed slightly, and cold sensitivity did not recover at all. Therefore, the reason why some participants were still struggling with activities could be because the occupational therapy intervention they received might not have been long enough as the authors previously found that the physical aspects of hand function improve a year after repair and reconstruction, or their mental health might not have improved yet. Another reason could be that the participants expected to be able to do everything they did before the hand injury so that they could go back to work and provide for their families as previously mentioned that most of the participants were males, breadwinners in their families and from the working age-group.

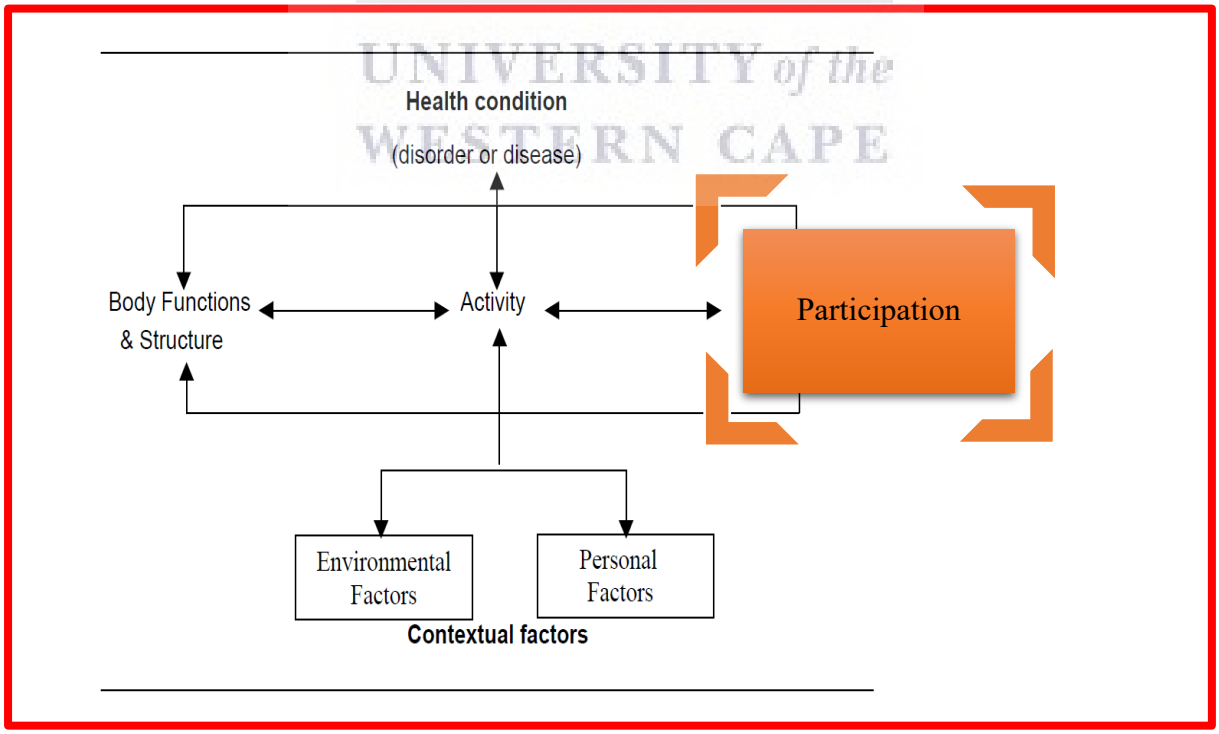
Before the participants started their occupational therapy intervention, many of the participants mentioned that they felt dependent on people after they sustained their hand injuries, which was indicated in Theme Three. The participants depend on family members to cook, do the laundry, do the garden work, feeding, dressing and washing the dishes. Many of the participants mentioned that after their hand injury, they tried to participate in their activities of daily living. Some of the participants use their unaffected hand to do their activities of daily living; others also take breaks in between. One participant mentioned that they had adapted quite a lot when it comes to participating in their activities of daily living as they could do everything for themselves after their hand injury. Lai (2004) states that early responses concerning hand injuries involves being upset, angry, unhappy, resentful, and pessimistic. Lai (2004) also stated that patients' longing to overcome dependency on others was found to be effective useful basis of motivation for recovery. Failure to complete meaningful activities results in frustration and discouragement. Therefore, the participants in the study attended occupational therapy because they felt frustrated by being dependent on other people, and this motivated them to recover. Bear-Lehman (1983) states that ''Injury deprives individuals of independent performance of self-care and homemaking tasks,'' so many of these activities may have to be completed by the patient's spouse or significant other. Cederlund et al. (2010) states that dependence may be stressful for patients with hand disorders. However, after the participants received the occupational therapy intervention, they mentioned that they are taking care of themselves quite well as they try to do everything for themselves. The average participant felt more capable, confident, and useful regarding their arm, shoulder or hand problem at the end of the intervention received because they felt as if

improvement was noted regarding their hand injuries. This improvement leads to the participants feeling less depressed, stressed and incapable. This resulted in the participants feeling satisfied with their upper limbs after they received the occupational therapy intervention. The participants were able to participate more in the occupations and activities that were meaningful to them after they received the occupational therapy intervention, which led them to have higher self-esteem, identity, motivation, and *outlook* on life. Being able to participate allowed the participants to engage in meaningful activities and occupations successfully.

5.3 TO EXPLORE INFLUENCES OF OBHT ON THE QUALITY OF LIFE OF CLIENTS WITH HAND INJURIES

The above objective is discussed based on the component of ICF (i.e., participation) and the findings emerged in Chapter four.

5.3.1 PARTICIPATION



Activities are tasks or actions executed by the individual, and participation relates to involvement in a life situation (WHO, 2001). The quantitative data, as well as Themes Three and Four, support this component of ICF. Furthermore, an objective to the current study was to explore the influences of OBHT on the quality of life of clients with hand injuries. In this section of the current study, the influences of OBHT on the quality of life of clients with hand injuries are discussed which was indicated in Themes Three and Four, as well as the quantitative data.

Within the findings of the study, it was found that the participants made statistically significant improvements in their functional performance after the occupational therapy intervention. The present findings also suggest that the participants felt like there was an improvement in the difficulty of carrying a grocery bag with both of their hands. The result of the study also indicates that participants considered an improvement in the difficulty of eating with a knife/fork with both of their hands. The findings suggest that the participants believed that the difficulty in washing dishes with both of their hands improved after the intervention. The study indicates that the participants highlighted that their ability to hold a glass of water has improved after the intervention. It was found that the average participant in the study felt as if carrying an object over 5kg became less demanding after the intervention. It was also found that placing an object on a shelf above the participants' heads became less difficult to do after the intervention. Based on the findings in the current study, it is evident that the health condition, which was the hand injuries, made it difficult for the participants to participate in meaningful activities and occupations. However, after attending the intervention, it became less complicated for participants to participate in meaningful activities and occupations. Rogers and Wilder (2009) corroborate this by stating that

hand OA signs and symptoms may include joint deformity, reduced hand strength, pain, and decreased function in hand-related activities of daily living (ADLs). Brorsson et al. (2009) concur with the findings and state that hand exercise is, therefore, a successful intervention for rheumatoid arthritis patients, leading to better function and strength. Bergstra, Murgia, Te Velde and Caljouw (2014), also found that hand exercises might have optimistic effects on strength and some aspects of daily functioning without provoking disease activity or pain. However, Case-Smith (2003) found that clients with upper limb injury or surgery made effective, optimistic gains in functional measures resulting from client-centred occupational therapy rehabilitation. Sade, İnanir, Şen, Çakmak, Kablanoğlu, Selçuk and Dursun (2016), state that with its broad functional ability, the hand plays a significant role in independent daily living and communication with the environment. As the most moveable part of the upper limb, the hand is actively used in everyday life and professional fields. Late rehabilitation after tendon injuries can damagingly affect functional status. Early mobilization methods, and all-inclusive rehabilitation applications could increase the functional independence of patients with hand injuries (Sade et al., 2016). However, Pérez-Mármol, García-Ríos, Ortega-Valdivieso, Cano-Deltell, Peralta-Ramírez, Ickmans and Aguilar-Ferrándiz (2017) found that a rehabilitation intervention for fine motor skills may increase manual dexterity and fingers range of motion in hand OA. However, results on upper limb disability, pinch strength, functionality, performance in ADLs, and self-efficacy remain uncertain. Therefore, in the current study, after attending the intervention it became less difficult for the participants to participate in meaningful activities and occupations as early mobilisation and rehabilitation increased the functional independence of patients with hand injuries. As a result, increasing the

functional independence of patients with hand injuries increases the quality of life that the patient experiences.

The results of the current study show that the participants' believed that their abilities to participate in recreational activities which required impact through their arm, shoulder, or hand improved at the end of the intervention. The results also indicated that the participants' ability to participate in recreational activities, which required little effort, became less difficult to do after the intervention. Melvin (1985) states that occupational therapy generates a pivotal influence on the practice and continued development of hand rehabilitation. The unique combination of training in functional, psychological, social, physical, and vocational features of physical dysfunction assists the occupational therapist in providing all-inclusive treatment required to return the patient with hand dysfunction to a productive lifestyle. Therefore, after the participants attended the intervention, it became less difficult for the participants to participate in recreational activities, which promotes a productive lifestyle. The findings of Wolf, Chuh, Floyd, McInnis and Williams (2015) are consistent with the current study and state that OBI's increase occupational performance and areas of occupations in patients. Recreational activities fall a part of an individual's areas of occupation. Therefore, improved participation in activities of recreation leads to a promotion of a productive lifestyle and results in an increased quality of life.

Within the current study, it was found that psychological aspects regarding the loss of function of a hand indicated a decreased quality of life as experienced by the participants. The participants indicated that they participated in meaningful activities before their hand injuries, but after sustaining the hand injuries, they were no longer able to participate in these meaningful activities, which affected their quality of life.

This speaks to the functional aspects of the participants as being unable to engage in meaningful occupations and activities influenced their quality of life. The participants previously had good functionality of their hands before the injury; subsequently, after a hand injury, they experienced a sense of loss, as the function in their hands decreased. This sense of loss made the participants to lose hope. The sense of loss compounded in the participants' inability to participate in meaningful occupations, causing a sense of boredom, and resulting in indulgent behaviours such as watching TV and sleeping. Another psychological aspect that the hand injuries had on the participants is feelings of being sad due to the inability to use their hands. Cone and Hueston (1974) did a study on the psychological aspects of a hand injury. The authors found that the patient's response to this loss of function after a hand injury trails the pattern of grief and mourning, which is consistent with the findings of the current study. In keeping with the findings of the present study, Gustafsson and Ahlström (2006) found that emotional distress is common in patients with an acute traumatic hand injury during the first weeks after they had accident. As the participants in the current study had recent injuries, they reported emotional distress regarding participation in activities, which is consistent with the findings of the authors (Gustafsson & Ahlström, 2006). Gustafsson, Persson, and Amilon (2000) did a study where the aim was to identify stress factors in the early stage of an acute traumatic hand injury. The authors found that practical problems with daily activities and being dependent on help from others for resolving concrete problems, were anxiety elements caused by functional impairment. The authors also noted that before the mishap, most of the individuals with hand-injuries, had been very active, working a lot with their hands in their leisure time, which is consistent with the experiences of the participants in the current study. The authors found that involuntary inactivity was a huge problem for some of their

participants. Gustafsson et al. (2000) state that other stress factors in the early stage were uncertainty about function in the future and pain, which corroborates the findings of the current study. Koestler (2010), states that both comorbid psychiatric conditions and psychosocial elements have been found to influence the medical treatment outcome in patients with hand injuries and pain, additionally complicating recovery and possibly leading to substantial psychological, social, and economic concerns for the individual. The psychological aspects of a hand injury are associated with feelings of grief and mourning, as the loss of function of the hand is linked with feelings of loss.

There are five stages of loss that people going during the process of change in life (Kübler-Ross & Kessler, 2009). The five stages comprise: (1) denial, (2) anger, (3) bargaining, (4) depression and (5) acceptance, which are a part of the framework that makes up our learning to live with loss. According to the authors, the first stage of loss, which is denial, supports people to survive the loss. In this stage, the world becomes empty and overwhelming (Kübler-Ross & Kessler, 2009). Relating to the findings of the current study, the participants felt meaningless and overwhelmed by their hand injuries as they felt as if they had to depend on people to participate in their activities. Anger is the second stage of loss. Anger is an essential phase of the healing process as the authors' state that underneath anger is pain, and it is natural to feel empty and abandoned. Bargaining is the third stage of loss. After a loss, bargaining may take the form of a provisional peace. Bargaining is associated with "if only" or "what if" statements (Kübler-Ross & Kessler, 2009). Many of the participants in the current study mentioned that if only they could stop the accident from happening. Depression is the fourth stage of loss. After bargaining, the individual's attention shifts into the present. Empty feelings present themselves, and grief enters their lives on a deeper

level. The individual who experiences the depressive phase feels as though it will last forever. It is vital to understand that this depression is not a sign of mental illness. It is the suitable response to a great loss (Kübler-Ross & Kessler, 2009). The participants in the current study experienced the stage of depression as they felt as if they could not participate in meaningful activities, which lead them to spend their time sleeping more and feeling sad due to the inability to use their hands. Acceptance is the fifth stage of loss. This stage is about accepting reality and recognising that this new reality is permanent (Kübler-Ross & Kessler, 2009). The participants in the current study experienced the stage of acceptance as they began to adapt their activities so that they could participate in meaningful activities. Many of the participants engaged in new activities over time. Acceptance leads to an increased experience of the quality of life, as the individuals begin to accept and learn to live with their hand injuries and role changes.

The findings of the present study suggest that the participants felt that after receiving the occupational therapy intervention, they did not take as long to complete work tasks, did not have to shorten their workdays, and they felt fewer limitations and difficulty with their work, as compared to before they received the intervention. The findings to the current study suggest that the occupational therapy intervention facilitated a return to the participants work. Hirth, Bennett, Mah, Farrow, Cavallo, Ritz and Findlay (2011) corroborate this and state that hand rehabilitation after extensor tendon repairs facilitates prompt mobilization, prompt functional hand use and prompt return to both daily living and work. In contrast, Shi, Sinden, MacDermid, Walton and Grewal (2014) state that succeeding a hand injury the impairment severity and lower pre-injury income influences the returning to work process. Kuoppala and Lamminpää (2008) state that the goal of rehabilitation is to increase work ability and functional capacity.

The findings of Kuoppala and Lamminpää (2008) are consistent with the current study, which found that rehabilitation approaches such as counselling, exercise, education, medical therapy, and ergonomics may increase an employee's work ability at an initial stage of a disease even though at any later stage they become unsuccessful if applied as the only mode of rehabilitation. Désiron, de Rijk, Van Hoof and Donceel (2011) found that the main objective of occupational therapy (OT), as part of the rehabilitation program, is to facilitate people to participate and engage in the meaningful activities of everyday life, including the ability to work. It was found that occupational therapy intervention positively influences the return-to-work process (Désiron et al., 2011). Therefore, the findings of the current study suggest that the health condition (hand injuries) that the participants were faced with influenced the way they performed at work, which was often a limited performance at work. This was also stressful to the participants due to their contextual factors, as many of the participants were the breadwinners in their families and, therefore, limited performance at work would risk participants losing their jobs and having no money to look after themselves and their families. Uys et al. (2020) support this finding as the authors found that the socio-economic burden of a hand injury in South Africa is substantial, predominantly for manual labourers whose job tasks are physically challenging and necessitate hand function. Obstacles to participation in work occur on an economic, social, and political level, as well as on a therapist and client-specific level (Uys et al., 2020).

Before the participants started attending occupational therapy, they had different views on the outcome of the occupational therapy intervention. The participants stated that they think occupational therapy will help them as their treating doctors have referred the participants to occupational therapy. Many of the participants stated that they feel

as if occupational therapy will help them as occupational therapist studied to work in their profession. After attending the occupational therapy intervention, the participants were asked whether they thought that attending occupational therapy has helped them with their hand injuries. Many of the participants stated that there are certain activities that they can participate in after attending occupational therapy.

Additionally, some participants mentioned that they were able to take care of themselves after attending occupational therapy. The findings of the current study indicate that attending occupational therapy intervention improves participation in activities. Case-Smith (2003) concurs with this statement as the author found that clients with reduced hand function, who do not have secondary complications, make considerable progress in a 6 to 8-week occupational therapy intervention for hand rehabilitation. Progress was noted in self-care, work, and employment were equally clinically and statistically significant. However, according to Case-Smith (2003) the clients' attitude, motivation, spontaneous recovery, own healing, and the supportive environment were possible factors that also impacted the positive adjustment after the occupational therapy intervention. The author found that participants made noteworthy improvements in physical roles, pain, physical health, and social participation, suggestive of important positive adjustments in quality of life after attending the occupational therapy intervention (Case-Smith, 2003). Therefore, after attending the occupational therapy intervention, the participants noted improvement in participation in activities as well as improved performance in their work activities, which leads to an increased quality of life as noteworthy improvements were made in their physical roles and health.

5.4 SUMMARY

In this chapter, the discussion of the results was done. The findings were discussed using the ICF model, which looked at the domains of the health condition, contextual factors, body functions and structure, participation, and activity. The findings confirmed that impairment in health condition affects the participation and activity level of the participants. The findings established that OBHT during occupational therapy intervention aids in improving hand function and the quality of life experienced by the participants. The average participant felt more capable, confident, and useful regarding their arm, shoulder or hand problem at the end of the intervention received because they felt as if improvement was noted regarding their hand injuries. This improvement leads to the participants feeling less depressed, stressed and incapable. The average participant felt more satisfied with their upper limbs after they received the intervention, as they were able to participate more in meaningful occupations, which resulted in an increased quality of life.

CHAPTER SIX

LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

6 INTRODUCTION TO THE CONCLUSION

In the previous chapter, the results of the study were discussed in relation to the objectives and components of the ICF. Therefore, chapter six deals with the research question, aim and objectives of the study. Additionally, the sixth chapter presents the limitations, recommendations, and conclusion of the study in connection with the study's findings.

6.1 RESEARCH QUESTION

Does occupation-based hand therapy improve hand functioning in areas of occupation among clients with hand injuries?

After the participants received the occupational therapy intervention consisting of OBHT, the average participant mentioned that returning to their previous activities were becoming easier. However, some participants were still struggling with certain activities. The results of this investigation show that enhancement in caring for oneself had been noted after the occupational therapy intervention. The most prominent finding to emerge from this study is that the average participant felt more capable, confident, and useful regarding their arm, shoulder, or hand problem at the end of the intervention. This improvement leads to the participants feeling less depressed, stressed and incapable. This, therefore, resulted in the participants feeling satisfied with their upper limbs and more able in participating in meaningful occupations and activities, which lead to higher self-esteem, identity, motivation, and *outlook* on life.

6.2 AIM

The aim of the study was to examine the influences of OBHT in hand functioning with regards to areas of occupation among clients with hand injuries within occupational therapy practice in a South African context.

6.3 OBJECTIVES OF THE STUDY

- **To describe the participants' socio-demographic characteristics**

The study has shown that the participants' ages ranged between 20 and 60, with the majority being between the ages of 20 and 40. 83.3% of the participants were male, and 16.7% of the participants were female. This indicates that hand injuries were more common amongst males. Majority of people living in Mthatha are African and using public health services. 63.9% of the participants were single, and 36.1% of the participants were married. This indicates that the majority of the participants were single. Since the majority of the participants were young adults, there was a link between marital status and age, as well as marital status and gender. The majority of participants in the study were right-hand dominant. Three participants (8.3%) were unemployed before their hand injuries; 47.2% of the participants were subsequently unemployed after sustaining a hand injury. 52.8% of the participants indicated that they did not return to work. Most of the participants in the study had a low level of education, having not completed high school, while the majority came from low earning household incomes.

- **To assess whether OBHT has effects on hand functioning (motor skills) among clients with hand injuries**

The study has shown that the participants in the study mostly considered the sensation in their hands to be intact. This study has found that generally the average participant thought there was an improvement in the way their right and left hands worked after receiving the occupational therapy intervention. One of the more significant findings to emerge from this study is that the strength in the participants' right and left hand had improved after the intervention. After the occupational therapy intervention, it was found that the pain experienced by the participants had subsided. The findings suggest that in general, the participants considered the severity of stiffness in their arm, shoulder, or hand, to have improved after the intervention. It was also shown that the average participant felt more satisfied with the overall function of their left hand. The result of the investigation shows that participants experienced an improvement in the motion of the fingers in their left hands after they have received the occupational therapy intervention.

- **To explore influences of OBHT on hand functioning which directly relates to the quality of life of clients with hand injuries**

The study has shown that the participants made statistically significant improvements in their functional performance after the occupational therapy intervention. Participating in meaningful occupations allow individuals to have an increased sense of the quality of life. The findings suggest that in general, following the intervention, the participants noted an improvement in the following: the ease of carrying a grocery bag with both of their hands; in the dealing with the complexity of eating with a knife/fork; the difficulty in washing dishes with both of their hands; the ability to grasp

a drinking glass; carrying an object over 5kg became less challenging; and placing an object on a shelf above the participants' heads became less difficult. The results of the current study found that the participants' believed that their abilities to participate in recreational activities, which required little effort and more impact through their arm, shoulder, or hand, improved at the end of the intervention. It was established that the participants thought that after they have received the occupational therapy intervention, their occupation of work had improved. The time it took for the participants to complete their work tasks had become shorter, they did not have to shorten their workdays, they also felt less limited and difficulty in their work as compared with before they received the occupational therapy intervention. The following conclusion can be drawn from the present study that the participants noted that after they attended occupational therapy, their occupational engagement improved and their ability to care for themselves had improved.

6.4 LIMITATIONS TO THE STUDY

Limitations are factors that cannot be controlled by the researcher and have an influence on the methodological output of the research (De Vos, Delport, Fouché, & Strydom, 2011). The following challenges have been observed as limitations of this study's findings:

- Many of the patients did not adhere to their appointment dates. Nelson Mandela Academic Hospital is a tertiary hospital based in the Eastern Cape. Therefore, the catchment area of the hospital is broad which means that patients have to travel long distances to come to the hospital. This often meant that patients did

not have money to travel to the hospital to adhere to their appointment dates and subsequently lead to not completing their intervention.

- Recruitments to the study were conducted via referral to the occupational therapy department. This meant that not all the participants started their interventions at the same time.
- Most of the participants were from one racial group; however, the exclusion was not done on purpose, but was the result of the availability of patients that was referred to the occupational therapy department after sustaining a hand injury.
- The participants in the study were mostly males; once again, this selection was not purposeful and depended on the patients referred to the occupational therapy department.
- The tools administered in the current study were originally designed to be self-administered, however, due to the low literacy levels the tools had to be read and translated to the participants.
- Further limitations in the study includes a lack of measures put into place to limit potential bias as the occupational therapist in the setting is the researcher as well.
- A lack of measures was put in place to verify the responses of participants such as back translation and member checking.
- Lastly, the researcher combined the MHQ results on one sheet on the SPSS. The pre- and post-tests should be on separate sheets to reflect accurately that 25 participants were a part of the study and to not influence the results in any

way. This led to the MHQ results reflecting a number of 36 participants where the study sample size indicated that 25 participants were used.

6.5 RECOMMENDATIONS

This section presents the recommendation based on the findings of the study. The recommendations are related to occupational therapy practice, policy on OBHT and future research.

6.5.1 OCCUPATIONAL THERAPY PRACTICE

- OBHT should be incorporated more thoroughly in the teaching of undergraduate occupational therapy. This would result in clinicians practising OBHT more and not allowing the core of occupational therapy (OBI's) to get lost over time.
- Clinicians should include the language of OBIs with colleagues to allow for client-centred and holistic treatment instead of focusing on body function and structure.
- OBHT courses should be made available in South Africa to encourage further training for clinicians.

6.5.2 POLICY ON OCCUPATION BASED HAND THERAPY

- In South Africa, multidisciplinary teachings and awareness should be incorporated thoroughly in medical studies as doctors have the first contact with patients. This would allow for appropriate and timeous referrals of patients with hand injuries sanctioning better treatment outcomes.

- Occupational therapists should reflect on how to improve their treatment sessions and allow for more OBHT by using the day-to-day challenges they experience as an opportunity to improve the treatment given.
- Patient appointments should be appropriately scheduled to allocate adequate time for OBHT.
- If the resources or materials for OBHT are limited in the occupational therapy department, the occupational therapists should ask the patients to bring their own equipment during the treatment session.
- Education to the clients and caregivers should be done to develop their knowledge of OBHT and the entire rehabilitation procedure.
- Sufficient explanations about how OBHT can improve the patients' health and wellness are vital in the therapy process.
- Workshops, seminars, guided clinical training, mentoring and additional continuing education could inspire occupational therapists to use the OBHT in their daily practice.
- Occupational therapists are required to communicate their expertise and knowledge with others about their role in the treatment of patients so that they may increase understanding and cooperation from other healthcare practitioners and increase referral numbers for OBHT.

6.5.3 FUTURE RESEARCH

- An embedded mixed method study on OBHT should be executed to understand the perceptions of participants with hand injuries over a year instead of three

months as done in the current study. This will allow researchers and clinicians to understand the effectiveness of OBHT further and to provide a greater degree of accuracy on this matter.

- Funding should be considered when exploring this current study further as participants fail to attend weekly appointments due to the lack of money to travel to the hospital. Therefore, when participants are funded with transport money to attend the occupational therapy intervention weekly, the results to study might be different due to regular weekly appointments being held by the participants.

6.6 CONCLUSION

This study's research question was answered using an embedded mixed-method approach, which also assisted in attaining the research question and objectives of the study. The results of the study provided insight into the effects of OBHT on clients with hand injuries in occupational therapy practice. This final chapter provided the reader with an outline of the study and the conclusions of the preceding chapters, from the introduction, theoretical framework, literature review, methodology, and presentation of the research findings. Recommendations were made based on the results. In addition, the researcher made suggestions for future research. In conclusion, the study is expected to add new knowledge to a limited body of literature on the effects of OBHT on clients with hand injuries in occupational therapy practice.

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Appendices

Appendix 1: Ethics clearance letter

UNIVERSITY of the WESTERN CAPE

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12 October 2018

Ms K Nero
Occupational Therapy
Faculty of Community and Health Sciences

Ethics Reference Number: BM18/7/21

Project Title: A quasi-experimental pilot study examining the effects of occupation-based hand therapy on clients with hand injuries in occupational therapy practice.

Approval Period: 09 October 2018 – 09 October 2019

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Appendix 2: MHQ and DASH Licenses

MICHIGAN License

License Agreement #11036-umich

This license agreement is ***completed***.

Pricing Information

Unit Price
$0.00

Quantity
1

Net Price
$0.00

Sales Tax
$0.00

Shipping
$0.00 None Selected

Total Price
$0.00

Licensee Information

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Kayla

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Nero

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Country
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Digital Downloads

This agreement includes 1 digital file, each available to the licensee for download.

- **Michigan Hand Questionnaire** - ZIP - 239 KB

  No expiration date or download limit set.

Full License Agreement

Following is the full and final license agreement text.

PROGRAM: **#3372** – Michigan Hand Questionnaire

This Agreement is made by and between The Regents of The University of Michigan, a constitutional corporation of the state of Michigan (hereinafter "MICHIGAN") and LICENSEE.

BACKGROUND

1. The University of Michigan's School of Medicine, Department of Plastic Surgery has developed a proprietary questionnaire, associated measurement application scoring and related documentation for use by trained individuals in surgery, plastic surgery and related investigational fields referred to as "The Michigan Hand Questionnaire," (hereinafter referred to as "PROGRAM"); and

2. LICENSEE desires to obtain, and MICHIGAN, consistent with its mission of education and research, desires to grant, a license to use the PROGRAM subject to the terms and conditions set forth below; and

The parties therefore agree as follows:

I. LICENSE

MICHIGAN hereby grants to LICENSEE a non-exclusive, non-transferable right to use the PROGRAM solely within the academic department listed above for academic research, non-commercial purposes and subject to the terms and conditions of this Agreement.

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protocols and monitoring of the study, required records and reports, and applicable protection of human subjects regulations.

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B. LICENSEE agrees that MICHIGAN has no obligation to provide to LICENSEE any maintenance, support, o update services. Should MICHIGAN provide any revised versions of the PROGRAM to LICENSEE, LICENSEE agrees that this license agreement shall apply to such revised versions.

V. INDEMNITY AND INSURANCE

A. LICENSEE shall defend, indemnify and hold harmless MICHIGAN for and against any and all claims, demands, damages, losses, and expenses of any nature (including attorneys' fees and other litigation expenses) resulting from, but not limited to, death, personal injury, illness, property damage, economic loss or products liability, including errors and omissions, arising from or in connection with the use by any person of PROGRAM distributed by LICENSEE and the use or practice by LICENSEE of the PROGRAM.

B. Prior to any use of any PROGRAM by LICENSEE, LICENSEE shall purchase and maintain in effect commercial general liability insurance, product liability insurance, and errors and omissions insurance which shall protect LICENSEE and MICHIGAN with respect to the events covered by the above paragraph A. Such insurance policy must provide reasonable coverage for all claims with respect to any PROGRAM used by LICENSEE and must specify MICHIGAN as an additional insured. LICENSEE shall furnish certificate(s) of such insurance to MICHIGAN, upon request.

VI. TERMINATION

A. If LICENSEE at any time fails to abide by the terms of this Agreement, MICHIGAN shall have the right to immediately terminate the license granted herein, require the return or destruction of all copies of the

PROGRAM from LICENSEE and certification in writing as to such return or destruction, and pursue any other legal or equitable remedies available.

VII. MISCELLANEOUS

A. This Agreement shall be construed in accordance with the laws of the state of Michigan. Should LICENSEE for any reason bring a claim, demand, or other action against MICHIGAN, its agents or employees, arising out of this Agreement or the PROGRAM licensed herein, LICENSEE agrees to bring said claim only in the Michigan Court of Claims.

B. THIS AGREEMENT REPRESENTS THE COMPLETE AND EXCLUSIVE STATEMENT OF THE AGREEMENT BETWEEN **MICHIGAN** AND **LICENSEE** AND SUPERSEDES ALL PRIOR AGREEMENTS, PROPOSALS, REPRESENTATIONS AND OTHER COMMUNICATIONS, VERBAL OR WRITTEN, BETWEEN THEM WITH RESPECT TO USE OF THE **PROGRAM**. THIS AGREEMENT MAY BE MODIFIED ONLY WITH THE MUTUAL WRITTEN APPROVAL OF AUTHORIZED REPRESENTATIVES OF THE PARTIES.

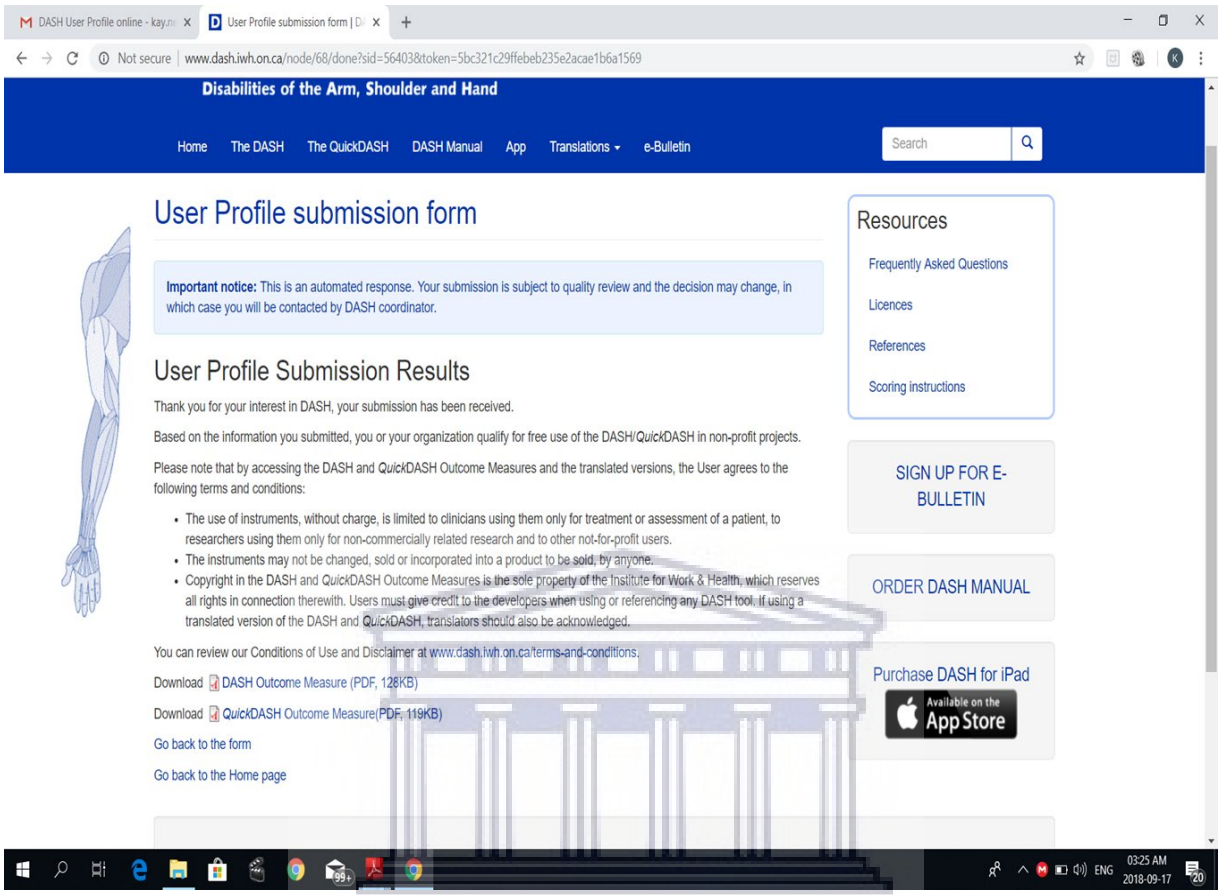
C. The terms and conditions of this Agreement shall prevail notwithstanding any different, conflicting, or additional terms or conditions which may appear in any purchase order or other document submitted by LICENSEE. LICENSEE agrees that such additional or inconsistent terms are deemed rejected by MICHIGAN.

D. Unless otherwise exempt therefrom, LICENSEE agrees that it will be responsible for any sales, use or excise taxes imposed by any governmental unit in this transaction except income taxes.

E. LICENSEE acknowledges that the PROGRAM is of United States origin. LICENSEE agrees to comply with all applicable international and national laws that apply to the PROGRAM, including the United States Export Administration Regulations, as well as end-user, end-use, and destination restrictions issued by the United States.

F. MICHIGAN and LICENSEE agree that any xerographically or electronically reproduced copy of this fully-executed agreement shall have the same legal force and effect as any copy bearing original signatures of the parties.

DASH License



Appendix 3: JROM

Upper Extremity Range of Motion Chart

Name:	DOB:	Diagnosis:	Date:

Left								Right						
							Dates							
						Normal		Normal						
						180˚	Shoulder Flexion	180˚						
						180˚	Shoulder Abduction	180˚						
						70˚	Shoulder internal rotation	70˚						
						90˚	Shoulder external rotation	90˚						
						145˚	Elbow flexion	145˚						
						(0)	Elbow extension	(0)						
						80˚-90˚	Forearm neutral position Supination (elbow bent)	80˚-90˚						
						80˚-90˚	Pronation (elbow bent)	80˚-90˚						
						80˚	Wrist flexion	80˚						
						70˚	Wrist extension	70˚						
						20˚	Wrist radial deviation	20˚						
						30˚	Wrist ulnar deviation	30˚						
						70˚	Thumb abduction	70˚						

Note: All measurements are PROM, unless specified by **A** for Active Range of Motion.
WFL= Within Functional Limits
WNL= Within Normal Limits

Appendix 4: Questions relating to engagement in occupations

Questions relating to engagement in occupations

1. What happened to your hand?
2. Describe the things that you enjoy doing at home before the injury occurred.
3. Describe the things that you enjoy doing at home after the injury has occurred.
4. How has the injury impacted your life?
5. What are the main concerns that you have about your hand injury?
6. Do you feel like you are independent in your life after your hand injury?
   (a) If not, what are the areas that you feel like you are not independent in?
   (b) If yes, specify which areas you feel like you are independent in.
7. How are things at home now?
8. Think about your life now, what do you see yourself doing in one year's time?
9. Do you think attending occupational therapy will/has helped you?
   (a) If yes, how will/has occupational therapy helped you?
   (b) If no, why do you think occupational therapy cannot/has not helped you?
10. How well do you think you participate and engage in your activities of daily living like caring for yourself/looking after yourself?

Appendix 5: Home program

PATIENT NAME: THERAPIST: Kayla Nero

Occupational Therapy Home Program

Nelson Mandela Academic Hospital

Checklist **Week starting:**_____

Area/Item	Title	Days of the week							signature
		Mon	**Tues**	**Wed**	**Thurs**	**Fri**	**Sat**	**Sun**	

Appendix 6: Information sheet

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
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Revised: December 2015

INFORMATION SHEET

Project Title: A Quasi-Experimental Pilot Study Examining the Effects of Occupation-based hand therapy on clients with hand injuries in Occupational Therapy Practice in the Eastern Cape, South Africa.

What is this study about?

This is a research project being conducted by Kayla Nero at the Nelson Mandela Academic Hospital. I am inviting you to participate in this research project because you fall a part of the criteria for the study as you have sustained a hand injury. The purpose of this research project is to examine whether occupation-based hand therapy improves hand injuries. The results found will aid the profession of occupational therapy with guidelines of treatment in hand therapy.

What will I be asked to do if I agree to participate?

You will be asked to attend a treatment session at the occupational therapy department at Nelson Mandela Academic Hospital. Treatment sessions will be once a week over the course of 12 weeks. Sessions will be for approximately 45 minutes- 1 hour. Within the treatment sessions you will be receiving occupational therapy treatment. The research will involve the participants being asked to make comments about their engagement in occupations which will be aimed at finding out how you are coping with your hand injury and whether the occupational therapy sessions has helped to improve your hand injury.

Would my participation in this study be kept confidential?

The researcher undertake to protect your identity and the nature of your contribution. To ensure your anonymity, the questionnaires are anonymous and will not contain information that may personally identify you. For coded identifiable information, (1) your name will not be included on the questionnaires and other collected data; (2) a code will be placed on the questionnaire and other collected data; (3) through the use of an identification key, the researcher will be able to link your questionnaire to your identity; and (4) only the researcher will have access to the identification key.

To ensure your confidentiality, all information will be stored on the researchers' laptop which is password protected, initials will be used on all data forms, and your occupational therapy files will be stored in cabinets in the occupational therapy department which only staff at the department has access to.

If we write a report or article about this research project, your identity will be protected.

What are the risks of this research?

There may be some risks from participating in this research study. All human interactions and talking about self or others carry some amount of risks. The researcher will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

The benefits to you include receiving occupational therapy once a week for 12 weeks.

This research is designed to help you personally, but the results may also help the investigator learn more about hand injuries and whether occupation-based hand therapy can improve hand injuries. The

researcher hope that, in the future, other people might benefit from this study through improved understanding of occupation-based hand therapy in occupational therapy.

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by Kayla Nero, Occupational Therapy Department at the University of the Western Cape. If you have any questions about the research study itself, please contact Kayla Nero at: *kay.nero@gmail.com*.

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Dr. Thuli Godfrey Mthembu

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Biomedical Research Ethics Committee

University of the Western Cape

Email: research-ethics@uwc.ac.za

Tel: (021) 959 4111

This research has been approved by the University of the Western Cape's Research Ethics Committee. (REFERENCE NUMBER: BM18/7/21)

Email: research-ethics@uwc.ac.za

Appendix 7: Informed consent

UNIVERSITY OF THE WESTERN CAPE

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CONSENT FORM

Title of Research Project: **A Quasi-Experimental Pilot Study Examining the Effects of Occupation-based hand therapy on clients with hand injuries in Occupational Therapy Practice in the Eastern Cape, South Africa.**

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

___ I DO agree to be audiotaped.

___ I DO NOT agree to be audiotaped.

Participant's name……..

Participant's signature…….

Date……